Remedial Investigation
Tidal Area Sites 1, 2, 9, and 11
Naval Weapons Station, Seal Beach Detachment
Concord, California

CLEAN II
Contract No. N62474-94-D-7609
Contract Task Order No. 217
Navy Remedial Project Manager: Clint Fisher

DRAFT
FINAL

Appendices F - U
June 1999

Volume 4 of 4

APPENDIX F

AMBIENT INORGANICS EVALUATION

CLEAN

Contract No. N62474-88-D-5086

Contract Task Order No. 0281

Navy Engineer-in-Charge: Ronald Yee

PRC Project Manager: Lynn Valdivia

NAVAL WEAPONS STATION
CONCORD, CALIFORNIA

TECHNICAL MEMORANDUM
ESTIMATION OF AMBIENT METAL CONCENTRATIONS IN THE TIDAL AREA SOILS

April 12, 1996

Prepared By

PRC ENVIRONMENTAL MANAGEMENT, INC.
135 Main Street, Suite 1800
San Francisco, CA 94105
(415) 543-4880

TECHNICAL MEMORANDUM
ESTIMATION OF AMBIENT METAL CONCENTRATIONS IN THE TIDAL AREA SOILS
NAVAL WEAPONS STATION CONCORD

CONTENTS

1.0 INTRODUCTION 1

2.0 APPROACH 2

3.0 CONCEPTUAL MODEL 3

4.0 STATISTICAL ANALYSIS OF THE SOIL DATA 5

4.1 DATA SET PREPARATION 5

4.2 EXCLUSION OF ANALYSES INDICATIVE OF SITE RELATED CONTAMINATION 6

4.3 CALCULATION OF AMBIENT METAL CONCENTRATION LIMITS 6

5.0 SUMMARY OF FINDINGS 7

REFERENCES 8

FIGURES

Figure

1 TIDAL AREA INVESTIGATION SITES. NAVAL WEAPONS STATION CONCORD

2 GEOLOGY OF WPNSTA CONCORD

3 PROBABILITY PLOT OF ALUMINUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

4 PROBABILITY PLOT OF ANTIMONY CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

5 PROBABILITY PLOT OF ARSENIC CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

6 PROBABILITY PLOT OF BARIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

7 PROBABILITY PLOT OF BERYLLIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

8 PROBABILITY PLOT OF CADMIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

9 PROBABILITY PLOT OF CHROMIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

10 PROBABILITY PLOT OF COBALT CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

11 PROBABILITY PLOT OF COPPER CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

12 PROBABILITY PLOT OF LEAD CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

13 PROBABILITY PLOT OF MANGANESE CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

14 PROBABILITY PLOT OF MERCURY CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

15 PROBABILITY PLOT OF MOLYBDENUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

FIGURES
(Continued)

16 PROBABILITY PLOT OF NICKEL CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

17 PROBABILITY PLOT OF THALLIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

18 PROBABILITY PLOT OF VANADIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

19 PROBABILITY PLOT OF ZINC CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

TABLES

Table

1 AMBIENT METALS CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES

TECHNICAL MEMORANDUM
ESTIMATION OF AMBIENT METAL CONCENTRATIONS IN THE TIDAL AREA SOILS
NAVAL WEAPONS STATION

1.0 INTRODUCTION

This technical memorandum, prepared by PRC Environmental Management, Inc. (PRC), presents the approach for estimating ambient metal concentration limits in Tidal Area soils at Naval Weapons Station (WPNSTA) Concord, California (Figure 1). The estimated ambient concentration limits are intended for use in the baseline human health risk assessment, ecological risk assessment, and remedial investigation (RI) of WPNSTA Concord Installation Restoration Program sites.

Naturally occurring concentrations of metals in soil, rock, and water are usually referred to as "background" concentrations. To evaluate the effects of site activities on the environment, constituent concentrations found at a site are typically compared to the background concentrations, and the difference between the site and background concentrations is assumed to be the impact of site activities.

In some cases, land development activities that are not associated with the specific Installation Restoration Program site activities being assessed may have resulted in relatively uniform changes to the original background concentrations. These concentrations represent conditions that existed before potential impacts from site-specific activities and will be referred to as "ambient" concentrations.

Because of the proximity of potential contamination sources, such as chemical plants, undisturbed or "true" background conditions are unlikely to occur within or near the Tidal Area. Efforts to identify a background or reference area upgradient from the Tidal Area sites have not been successful. U.S. Environmental Protection Agency (EPA) collected samples from two areas southwest of the Tidal Area sites in an attempt to identify a representative background site. Soil samples from the first area contained elevated levels of metals, specifically lead. Soil and water samples collected from an area farther inland than the first area also contained elevated levels of metals. In addition, petroleum hydrocarbons were observed in shallow soils. Consequently, EPA abandoned this second location. Therefore, in the absence of locations with background conditions within the Tidal Area or adjacent to

it, the approach presented in this memorandum entails use of the site-specific soil metals data collected for the RI to estimate upper limits for ambient concentrations.

This document describes the approach, conceptual model, and statistical analysis used in estimating ambient metal concentration limits for the Tidal Area. The results of the estimation are summarized in Table 1 and Figures 3 through 19.

2.0 APPROACH

A step-by-step approach for estimating ambient metal concentration limits is defined as follows:

1. Develop a conceptual model of soils in the Tidal Area and select the RI soil samples to be used in the estimation.

2. Query the database of RI soil analytical results for all metals except essential nutrients. Exclude from the data set the soil samples that may have been affected by site activities.

3. Account for each nondetected result by substituting a value of one half the reported detection limit. Prepare data sets for further evaluation through logarithmic transformations, when necessary, to approximate normal distribution.

4. Perform statistical operations to allow samples affected by site activities to be distinguished and excluded.

5. Use a nonparametric formula to estimate the ambient limits as the 80 percent lower confidence limit (LCL) on the 95th percentile, as was defined in consultation with regulatory agencies (PRC 1995).

3.0 CONCEPTUAL MODEL

The conceptual model developed for this task is a generalized representation of soil conditions and was used to justify the selection of the RI soil samples in estimating ambient limits for inorganic constituents. The model is based on a characterization of the Tidal Area subsurface materials and preliminary analysis of the grain size distribution in soil samples from the four sites.

Subsurface geology of the Tidal Area is best described as a zone of interfingering alluvial and estuarine depositional environments. The Tidal Area is divided into three distinct landforms, all of Quaternary age: foot slopes, flood plains, and marsh or wetlands (Figure 2). The four Tidal Area sites (IR sites 1, 2, 9, and 11) are located within the wetlands adjacent to Suisun Bay and underlain by fine grained silt and clay mixed with organic material that make up bay muds (Lee et al. 1986).

These bay muds have been divided into Younger Bay Mud and Older Bay Mud (McCulley, Frick and Gilman, Inc. 1987). Soil borings drilled at the four Tidal Area sites are confined to the Younger Bay Mud stratigraphic unit. The Younger Bay Mud is an estuarine/marine silty clay that is commonly compacted stiff to semi-hard, and varies in thickness from 15 to 50 feet. Sand lenses occur in the Younger Bay Mud and may represent historic streambeds or outwash deposits. Mineral compositions of bay muds consist of mica, montmorillinite, chlorite, kaolinite, quartz, and feldspar (Goldman 1969).

Soils beneath the four Tidal Area sites are composed of silty, and locally sandy, clay. Silty, fine grained sand lenses were observed in a few soil borings, but the lenses can not be correlated between soil borings (IT Corp. 1992). Based upon a preliminary analysis of the grain size distribution in soil samples collected from the sites during the remedial investigation, the fraction of silt and clay in subsurface materials tends to increase with depth; the sediments with highest ratios of coarse to fine materials are generally confined to the upper 0.5 feet below ground surface (bgs). Thus, due to a general decrease in soil permeability with depth, the leaching of metals downward from potentially affected surface soils is expected to be limited.

Statistical analysis of data on nineteen metals (excluding essential nutrients) from over 200 RI soil samples collected at the four sites has shown that some metals (aluminum, arsenic, chromium, nickel, and vanadium) have similar concentrations regardless of the depth of the sample. However, many

other metals exhibit higher concentrations in the surface soils than deep soils. For example, lead concentrations in shallow samples (up to 0.5 feet deep) are, on average, three times higher than in deep samples. Mercury and zinc concentrations in the surface soils are almost twice as high as in the deeper deposits. Using statistical comparisons (t-test and K-S test (Gilbert 1987)), the statistically significant differences in concentrations versus depth were confirmed for antimony, barium, cobalt, copper, lead, manganese, mercury, molybdenum, and zinc.

The consistency of concentrations at different depths and relatively narrow ranges of concentrations of aluminum, arsenic, chromium, nickel, and vanadium suggests they may be naturally occurring. The ranges of concentrations of arsenic, chromium, and nickel observed in the soils in the Tidal Area are comparable with the reported concentrations in the Suisun Bay sediments (San Francisco Estuary Institute 1994).

The elevated concentrations of lead, mercury, zinc, antimony, and copper in the uppermost soils may be related to both natural factors and the potential contamination sources. Relatively high levels of lead (about 200 milligrams per kilogram (mg/kg)) in the upper 0.5 feet of soils may be related to potential contamination releases from surrounding chemical plants. The occurrence of elevated mercury in the uppermost soils is likely attributable to the erosion and deposition of mineralized source materials from Los Medanos Hills. Further, there has been mining activity on the western slope of the Sierra Nevada mountain range since the late 1800s that may have indirectly contributed to accumulation of some metals (iron, copper, and lead) in soils of the Tidal Area. Under this hypothesis, metals dissolved by acid mine drainage or bound to particulates were transported via surface water to the Sacramento/San Joaquin river delta, and ultimately deposited in the Bay. Similarly, some metal compounds might have been deposited directly on the surface within the Tidal Area due to its flooding during high tides.

Because it is difficult to distinguish the influence of natural and anthropogenic factors on concentrations metals encountered in the uppermost soils of the Tidal Area, the evaluation of ambient metal limits is conducted using subsurface soil samples only. These subsurface soil samples used in the evaluation were collected between two and ten feet below ground surface.

Ambient metal concentration limits were estimated for all the metals available in the database of RI soil analytical results, excluding essential nutrients (sodium, potassium, calcium, magnesium, and iron). Several soil samples (from IR sites 1, 2, and 11) expected to be potentially affected by site activities have been excluded from the metal data sets before the evaluation. The size of the resulting data sets was in the order of 60 values (Table 1), which is sufficient to allow estimation of ambient limits using statistical methods that are discussed below.

4.0 STATISTICAL ANALYSIS OF THE SOIL DATA

The following sections describe briefly the statistical methods that are used to estimate ambient concentration limits for soil metals. A more detailed description of specific procedures used in the estimation may be found in the Technical Memorandum on Estimation of Ambient Metal Concentrations in Soils prepared for Mare Island Naval Shipyard in December 1995.

4.1 DATA SET PREPARATION

Before ambient metal concentrations can be estimated, most of the data sets required special preparation. Preparation procedures included steps to account for the nondetectable results and transformation of the data to approximate normal distributions.

The process of estimating ambient metal concentrations must account for analytical results reported as nondetect. For several metals, including antimony, beryllium, cadmium, mercury, molybdenum, and thallium, nondetect results constitute a significant percentage (nearly 50 percent or more) of the data set. The selenium and silver data sets almost entirely consist of nondetect results (Table 1).

Nondetectable results must be treated the same way in the ambient evaluation and in the risk assessment. Accordingly, a value of one-half the reported detection limit was substituted for each nondetect data point. Anomalously low nondetect values were excluded from data sets of some metals if these values were less than three times the standard deviation from the mean.

To evaluate whether it was necessary to transform a specific data set to logarithms to approximate a normal distribution, summary statistics, including the mean, standard deviation, coefficient of variation, skewness, and kurtosis were calculated. In particular, the values of skewness and kurtosis were useful indicators of the need for data set transformation.

Following transformation, if necessary, a working set of histograms and probability plots was built with Geo-EAS geostatistical software (EPA 1991) for interim graphical analysis. These figures were reviewed to evaluate the effectiveness of the data transformations applied, and to identify anomalously high metal concentrations or outliers. These outliers are likely to be associated with site activities and were excluded from ambient data sets as described below.

4.2 EXCLUSION OF ANALYSES INDICATIVE OF SITE RELATED CONTAMINATION

In performing frequency distribution analysis, a few metal concentration data points may be found at concentrations significantly greater than the main population. These outliers can be initially identified on histograms and probability plots, but more rigorously are defined as concentrations greater than three times the standard deviation from the mean. The outliers are generally attributed to site activities and are excluded from the data sets. It should be noted that since the data points considered as outliers may also represent extreme values of actual ambient concentrations, their exclusion may lead to conservative (low) estimates of ambient limits. The simultaneous exclusion of anomalously low or nondetect values from some data sets, as described above, may partially compensate for this bias.

4.3 CALCULATION OF AMBIENT METAL CONCENTRATION LIMITS

After making final adjustments to the ambient data sets as described above, a probability plot is prepared for each metal of interest to confirm the effectiveness of the preparation procedures and to proceed with calculation of ambient limits. For data sets with greater than 20 and less than 300 values, a nonparametric formula (Gilbert 1987) is used to estimate the ambient limits as the 80 percent LCL on the 95th percentile as follows:

(1) Rank the data from minimum to maximum to obtain the sample order statistics:

$$x_1 \leq x_2 \leq \ldots \leq x_k \ldots \leq x_n$$

(2) Calculate l:

$$l = p\ (n + 1) - Z_{1-\alpha} \sqrt{np(1 - p)}$$

where: $p = 0.95$,

n = number of values in the data set

$\alpha = 0.20$ = significance level

$Z_{1-\alpha} = Z_{0.80} = 0.845$, as obtained from Table A-1 published by Gilbert (1987)

The simplified formula is as follows:

$$l = 0.95\ (\ n + 1\ ) - 0.184\ \sqrt{n}$$

(3) If the calculated l is an integer, the 80 percent LCL on the 95th percentile is the lth largest datum (among the ranked concentrations) in the data set. If l is not an integer, estimate the 80 percent LCL on the 95th percentile by linear interpolation between the two concentrations closest to l.

5.0 SUMMARY OF FINDINGS

The ambient concentration limits estimated for metals in the Tidal Area soils through the procedures described above are presented in Table 1. The table include EPA PRGs and Sediment Screening Criteria (Regional Water Quality Control Board [RWQCB] 1992) for comparison purposes. The estimated ambient limits for arsenic, lead, manganese, and zinc exceeded at least one of these criteria, as indicated in Table 1 by asterisks.

As indicated above, probability plots that support the estimations are attached as Figures 3 through 19. Only the data points are plotted that remained in the data set after exclusion of outliers; the population of the nondetectable results is indicated as ND (where significant), and the type of underlying data set distribution (normal, lognormal, and nonparametric) is noted.

REFERENCES

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, New York.

Goldman, H.B. 1969. Geology of San Francisco Bay. In *Geologic and Engineering Aspects of San Francisco Bay Fill*. Edited by H.B. Goldman. California Division of Mines and Geology Special Report 97. pp. 9-30.

IT Corp. 1992. Draft Site Investigation Report, Volume I, Text and Volume II, Appendices A-F. Prepared for the Hazardous Waste Remedial Action Program, Martin Marietta Energy Systems, Inc. Oak Ridge, Tennessee.

Lee, C.R., et al. 1986. Remedial Investigation of Contaminant Mobility at Naval Weapons Station, Concord, California. Miscellaneous Paper EL-86-2. U.S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

McCulley, Frick and Gilman, Inc. 1987. Hydrogeologic Report, IT Corporation, Vine Hill and Baker Facilities, Contra Costa County, California. October 22, 1987.

PRC Environmental Management, Inc. (PRC). 1995. Estimation of Ambient Metal Concentrations in Soils. Mare Island Naval Shipyard, Vallejo. Technical Memorandum. December 15.

Regional Water Quality Control Board (RWQCB). 1992. Sediment Screening Criteria and Testing Requirements for Wetland Creation and Upland Beneficial Reuse.

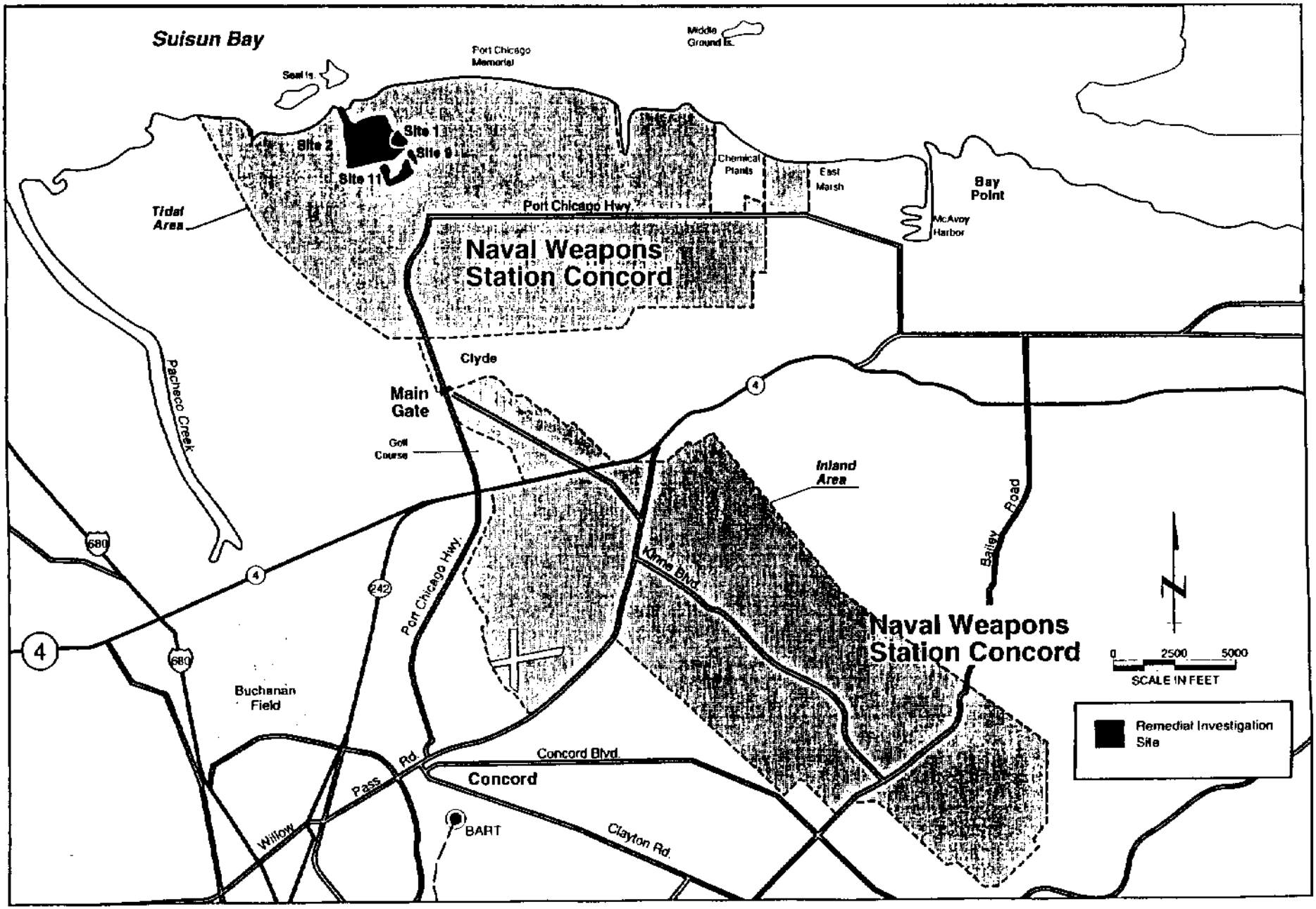
San Francisco Estuary Institute. 1994. San Francisco Estuary Regional Monitoring Program for Trace Substances. 1994 Annual Report.

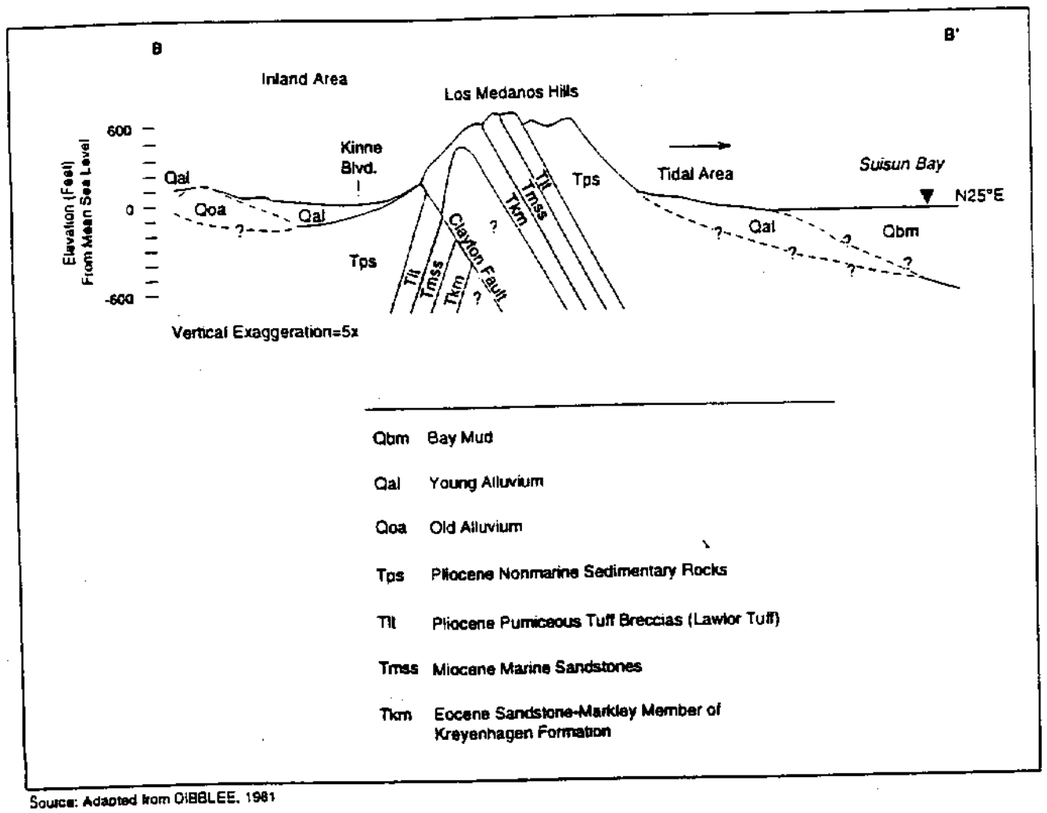
EPA. 1991. Geo-EAS. EMSL. P.O. Box 93478. Las Vegas, NV 89193-3478.

EPA. 1995. Region IX Preliminary Remediation Goals. Second Half 1995. September 1.

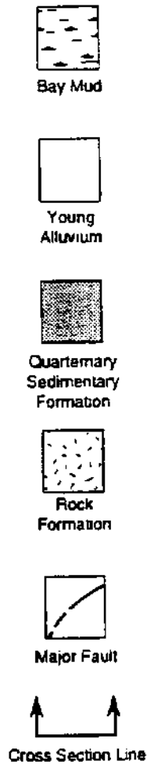
FIGURES

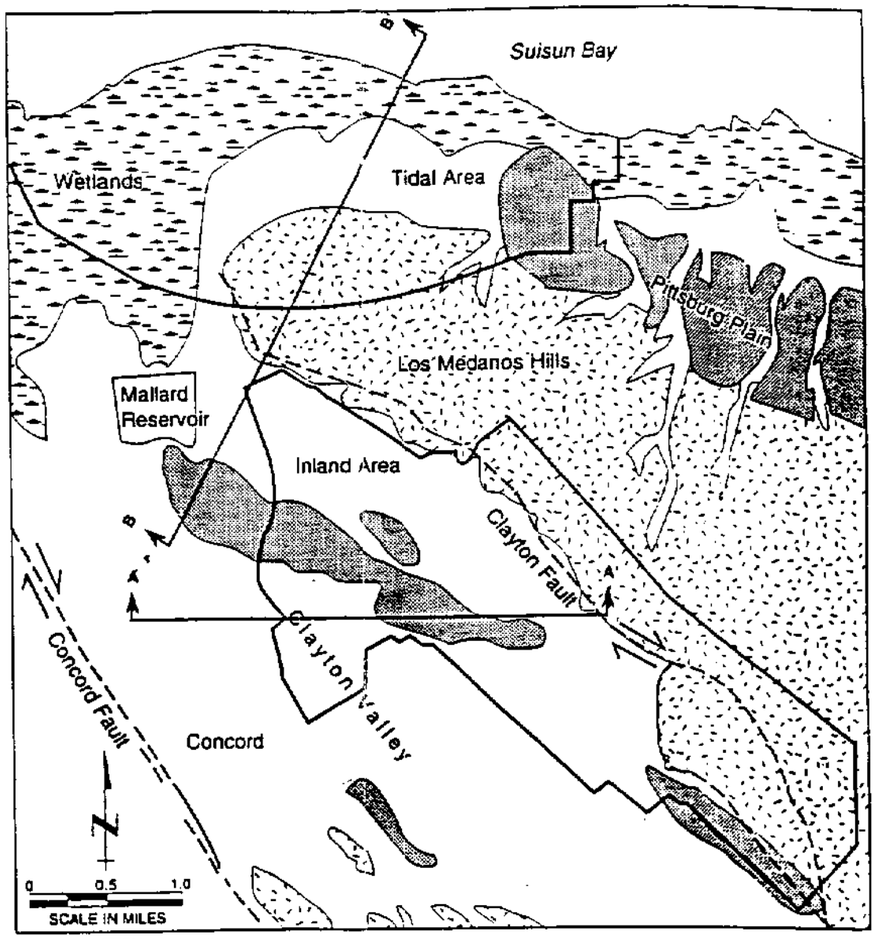
Figure 1: Tidal Area Investigations Sites. Naval Weapons Station Concord





Source: Adapted from DIBBLEE, 1981





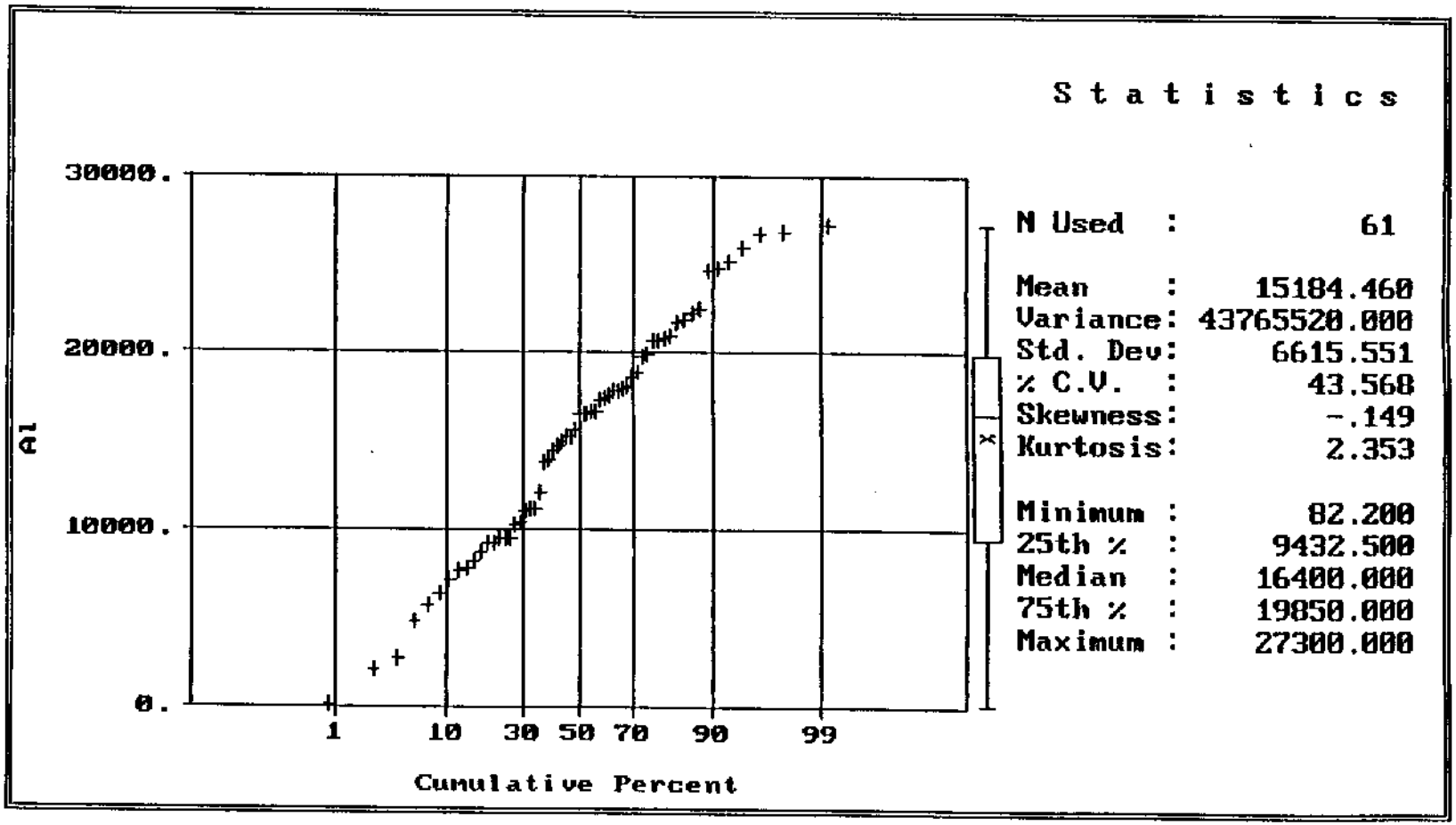
Source: LUTTON, et. al., 1987
DIBBLEE, 1980a,b,c, 1981

GEOLOGY OF WPNSTA CONCORD

FIGURE 2

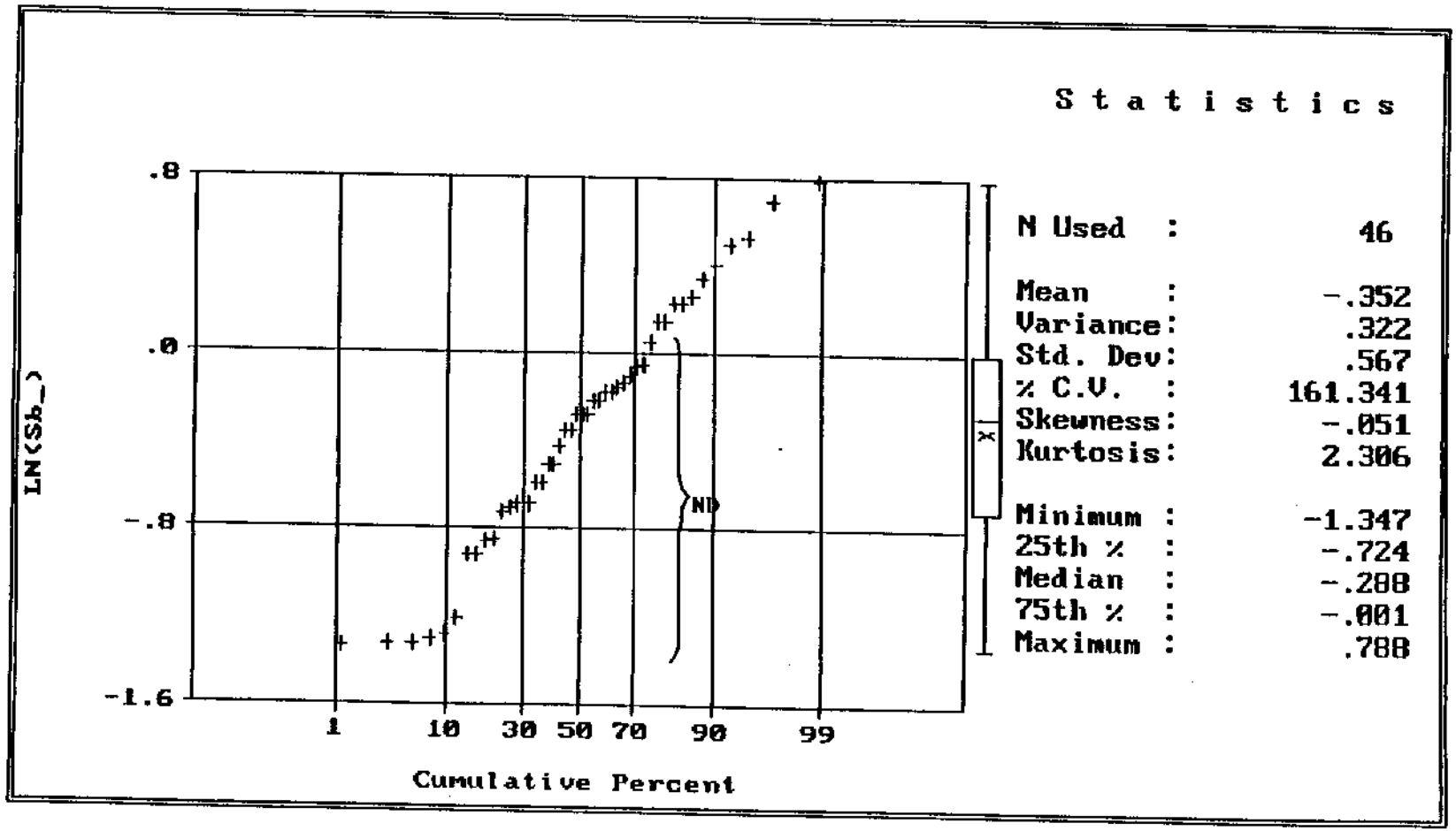
7/93 DD

FIGURE 3: PROBABILITY PLOT OF ALUMINUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES WPNSTA CONCORD



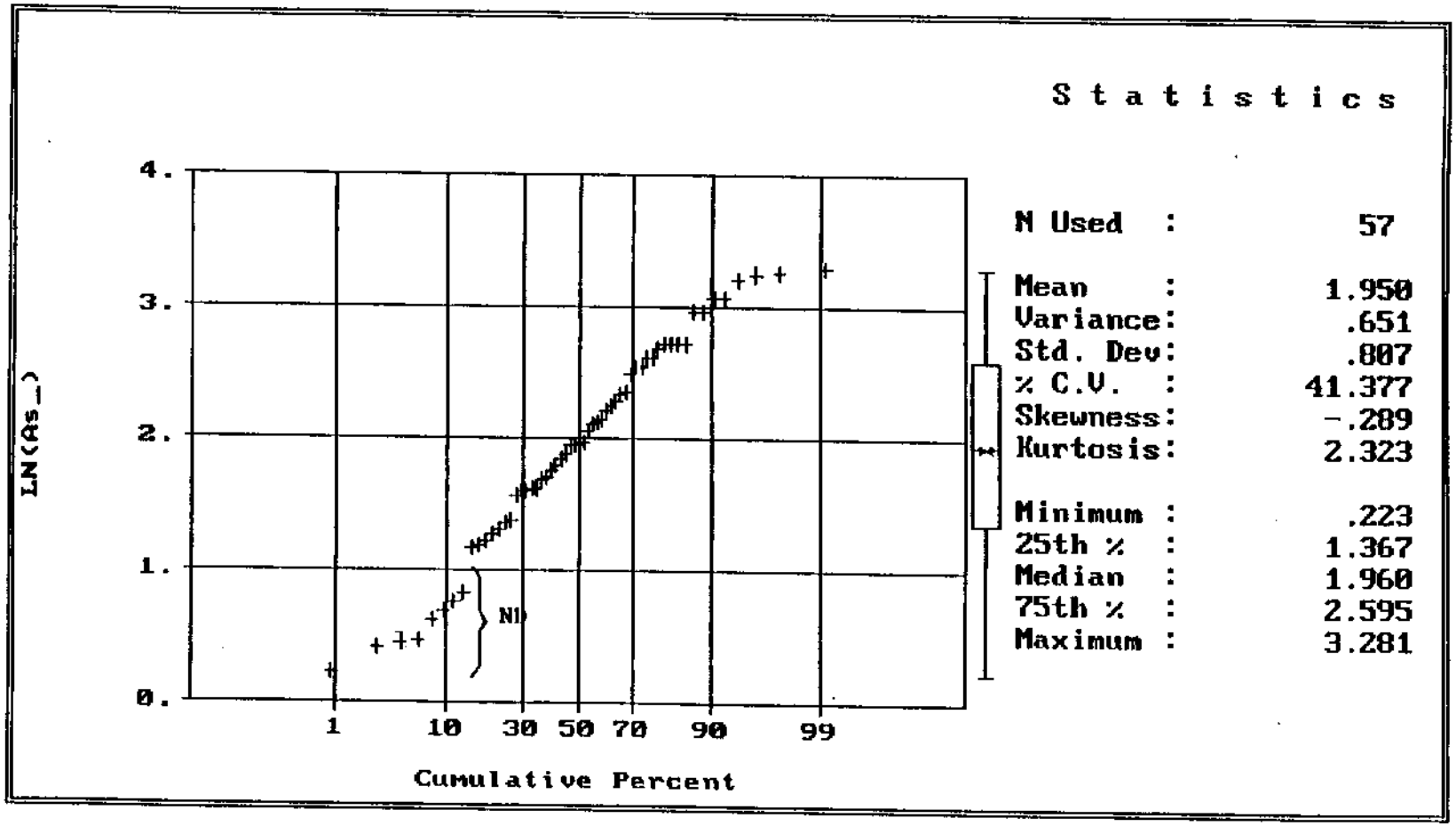
Note: The data set distribution is normal.

FIGURE 4: PROBABILITY PLOT OF ANTIMONY CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



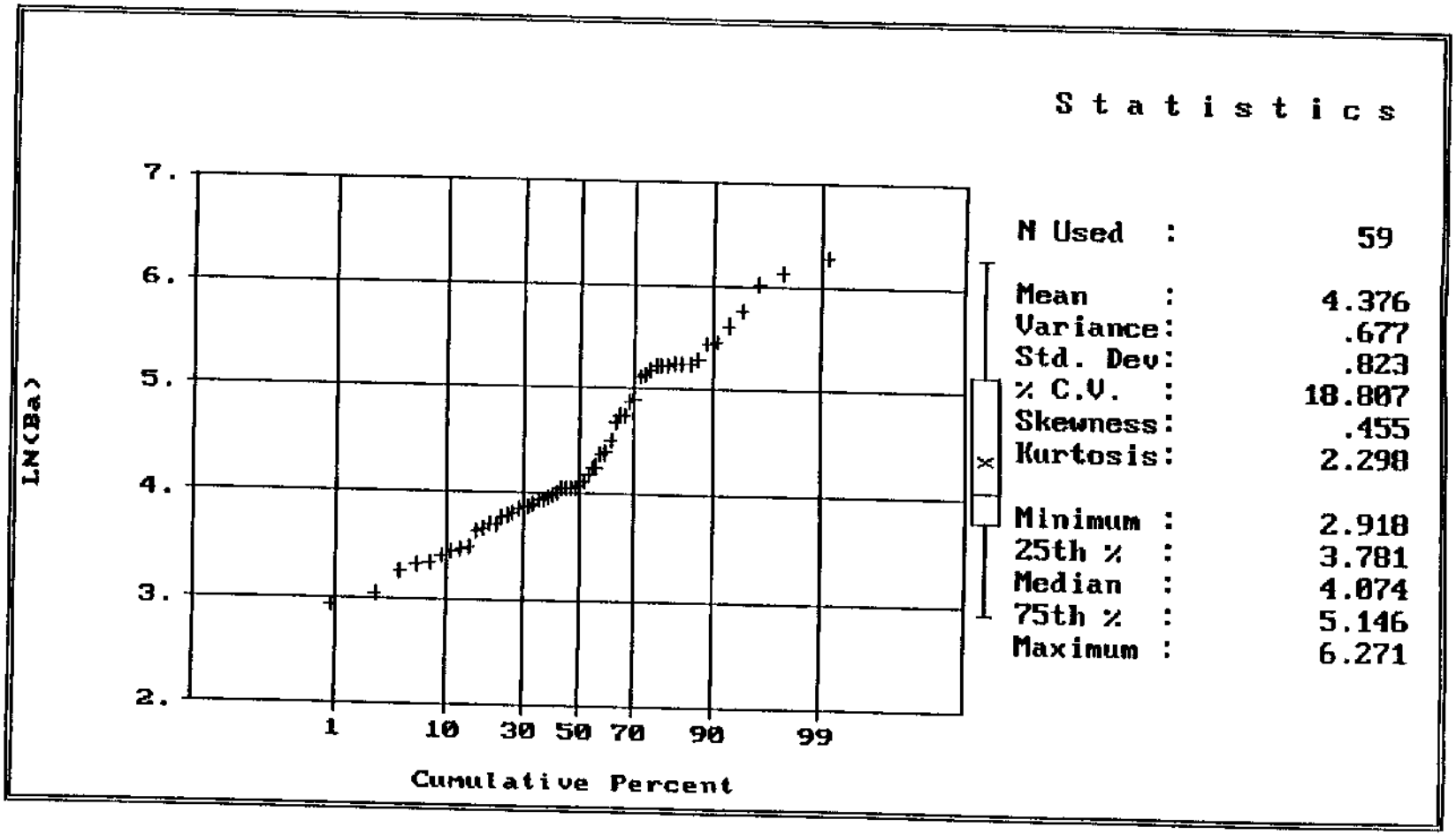
Note: The data set distribution is nonparametric.

FIGURE 5: PROBABILITY PLOT OF ARSENIC CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



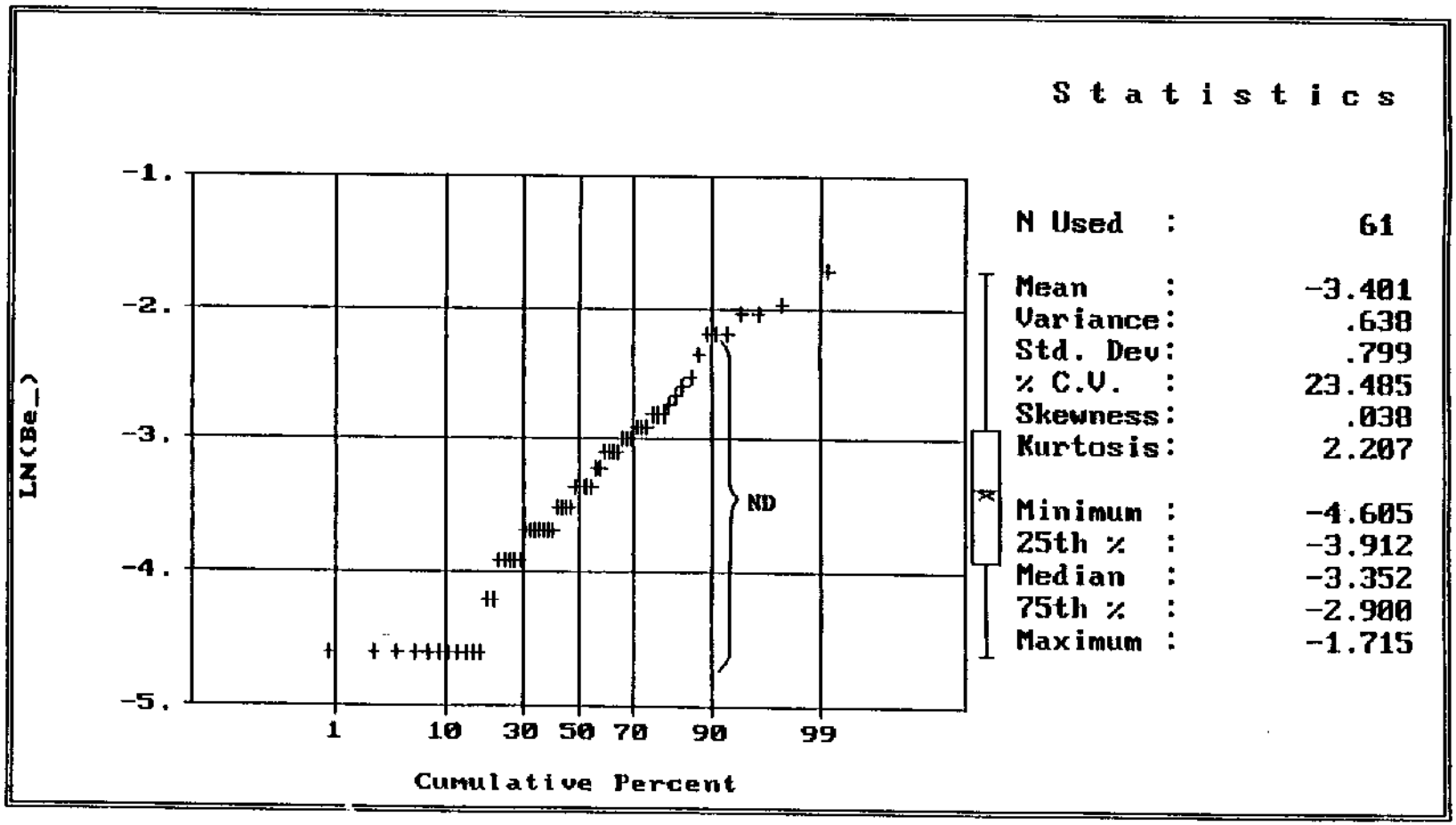
Note: The data set distribution is lognormal.

FIGURE 6: PROBABILITY PLOT OF BARIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES WPNSTA CONCORD



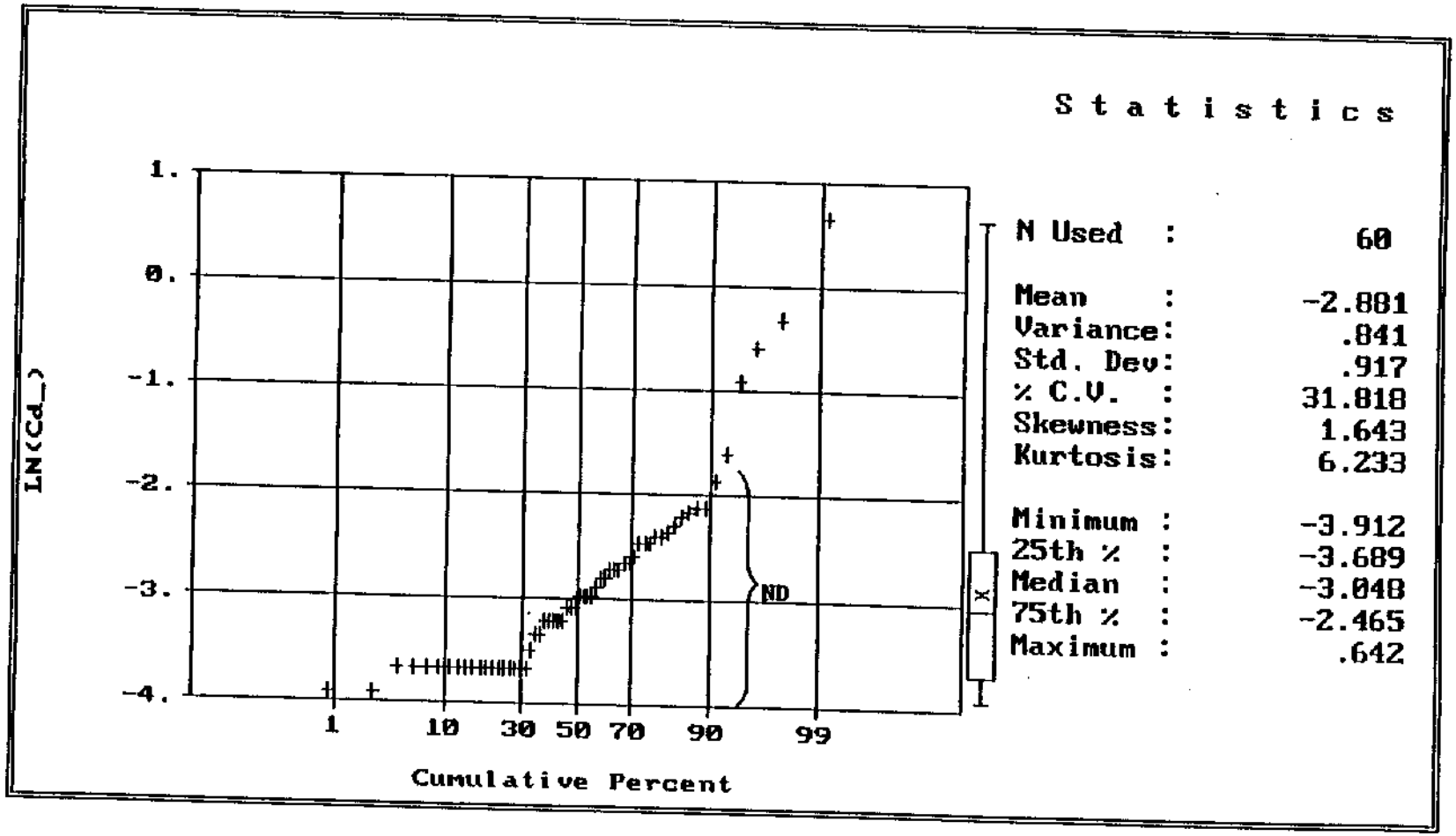
Note: The data set distribution is lognormal.

FIGURE 7: PROBABILITY PLOT OF BERYLLIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



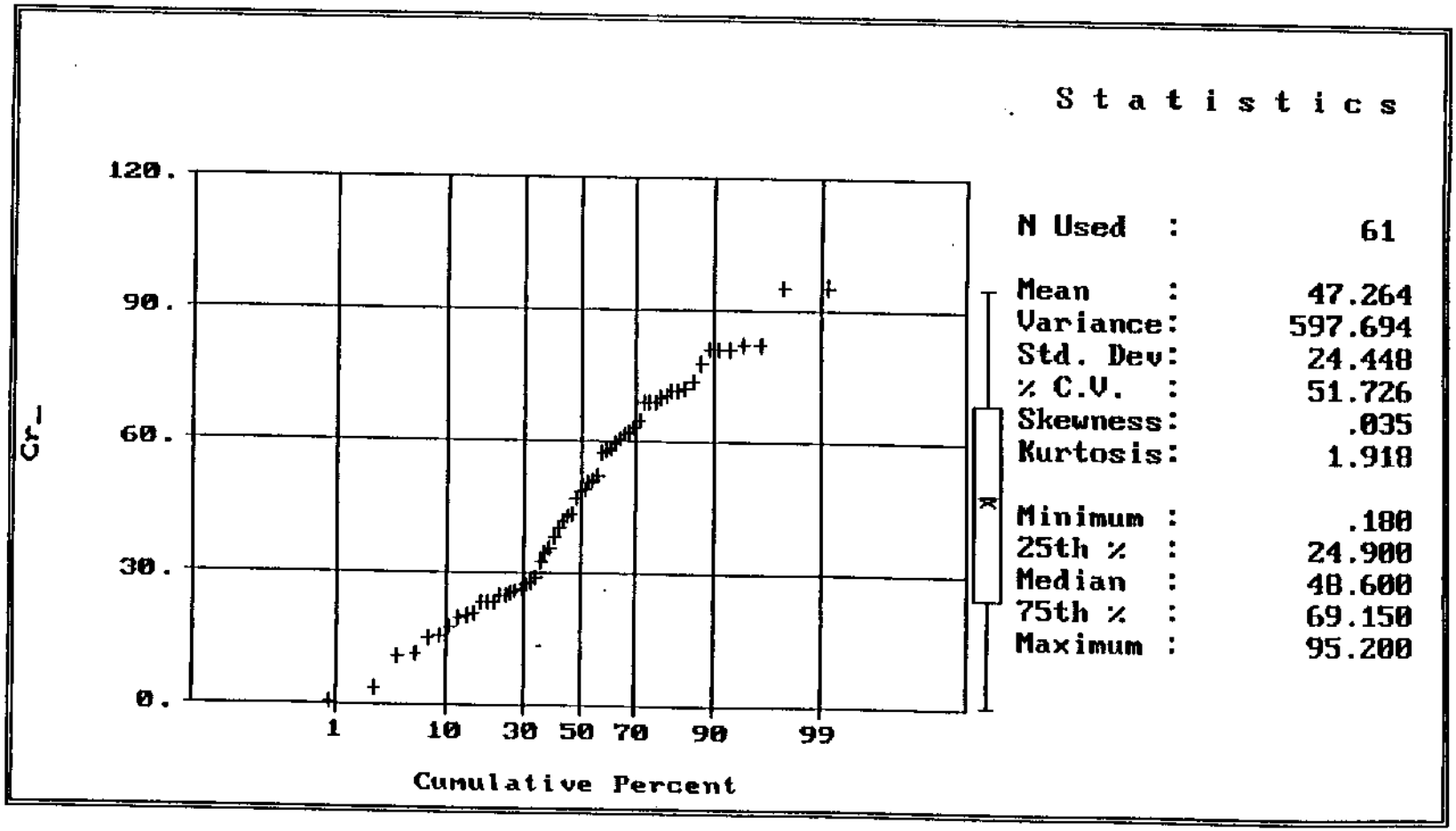
Note: The data set distribution is nonparametric.

FIGURE 8: PROBABILITY PLOT OF CADMIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



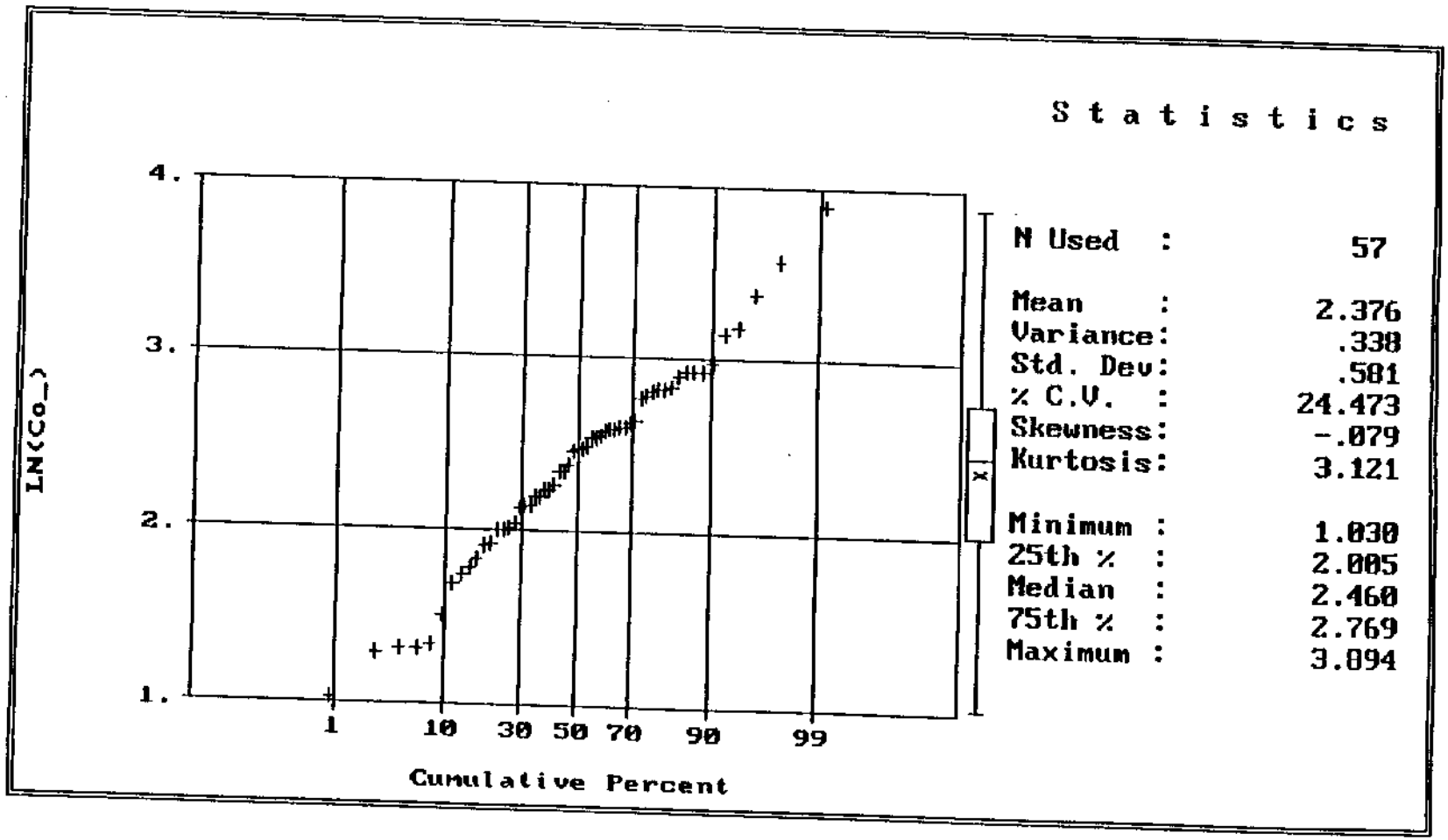
Note: The data set distribution is nonparametric.

FIGURE 9: PROBABILITY PLOT OF CHROMIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



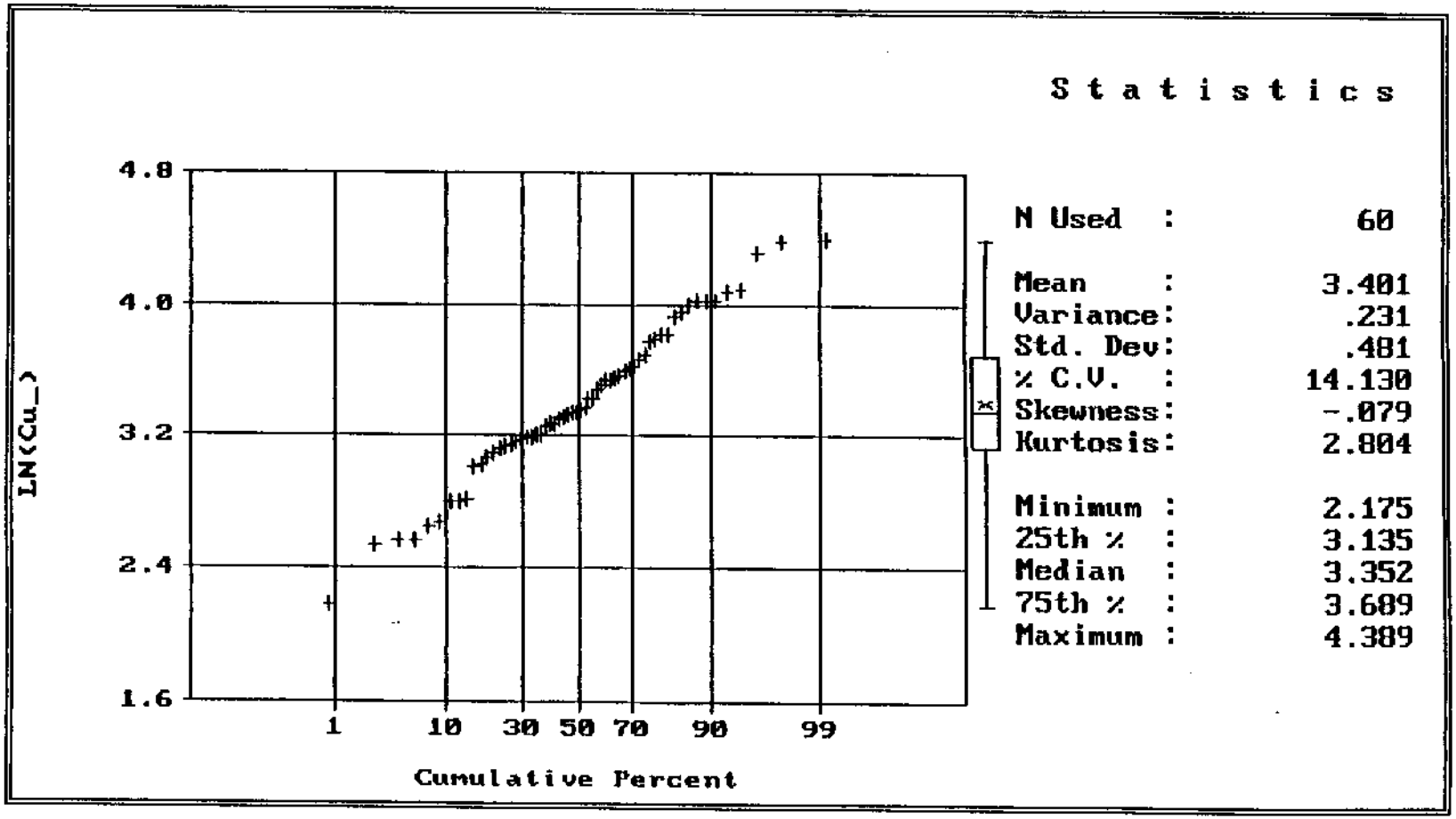
Note: The data set distribution is normal.

FIGURE 10: PROBABILITY PLOT OF COBALT CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



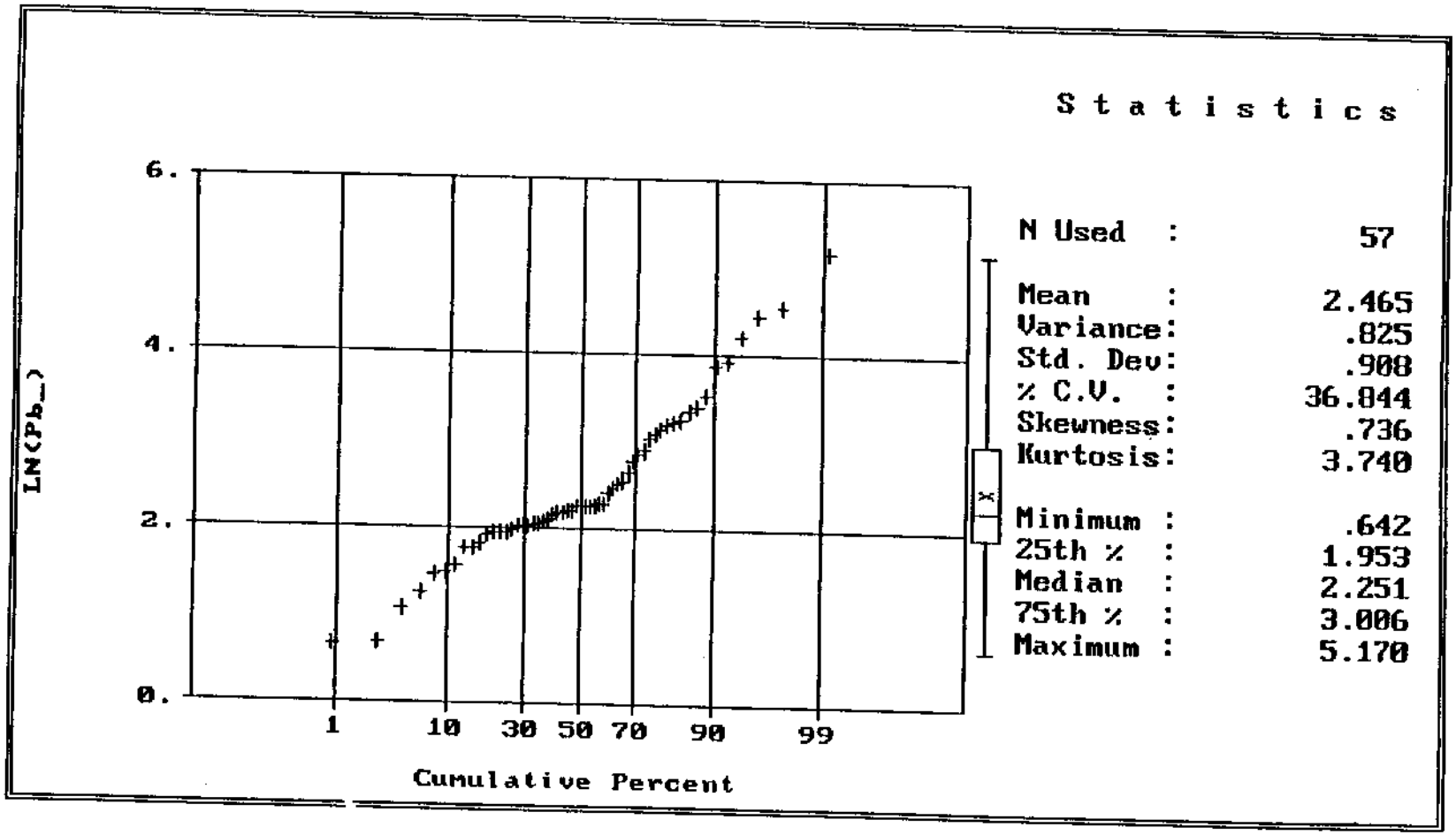
Note: The data set distribution is lognormal.

FIGURE 11: PROBABILITY PLOT OF COPPER CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



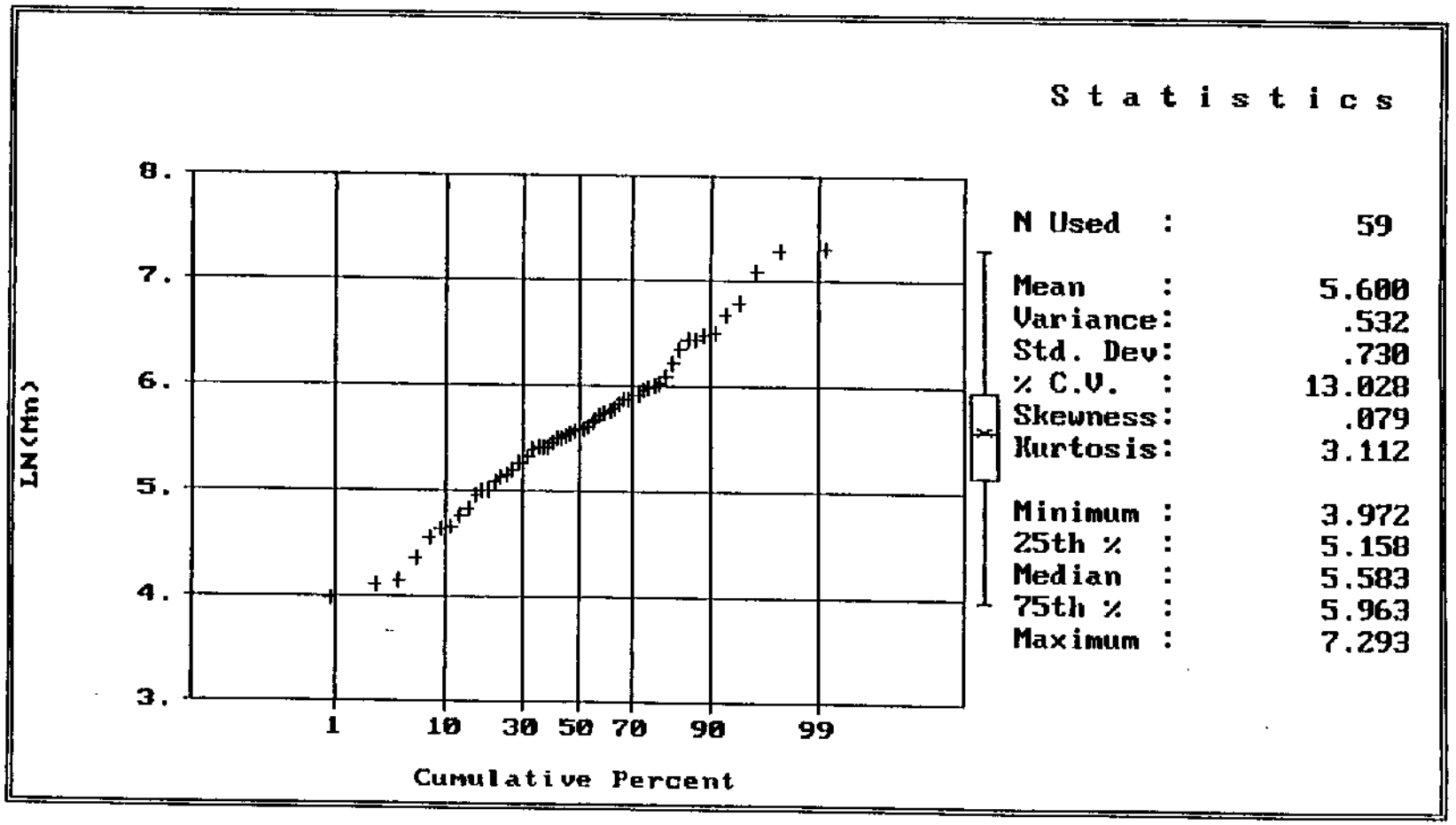
Note: The data set distribution is lognormal.

FIGURE 12: PROBABILITY PLOT OF LEAD CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



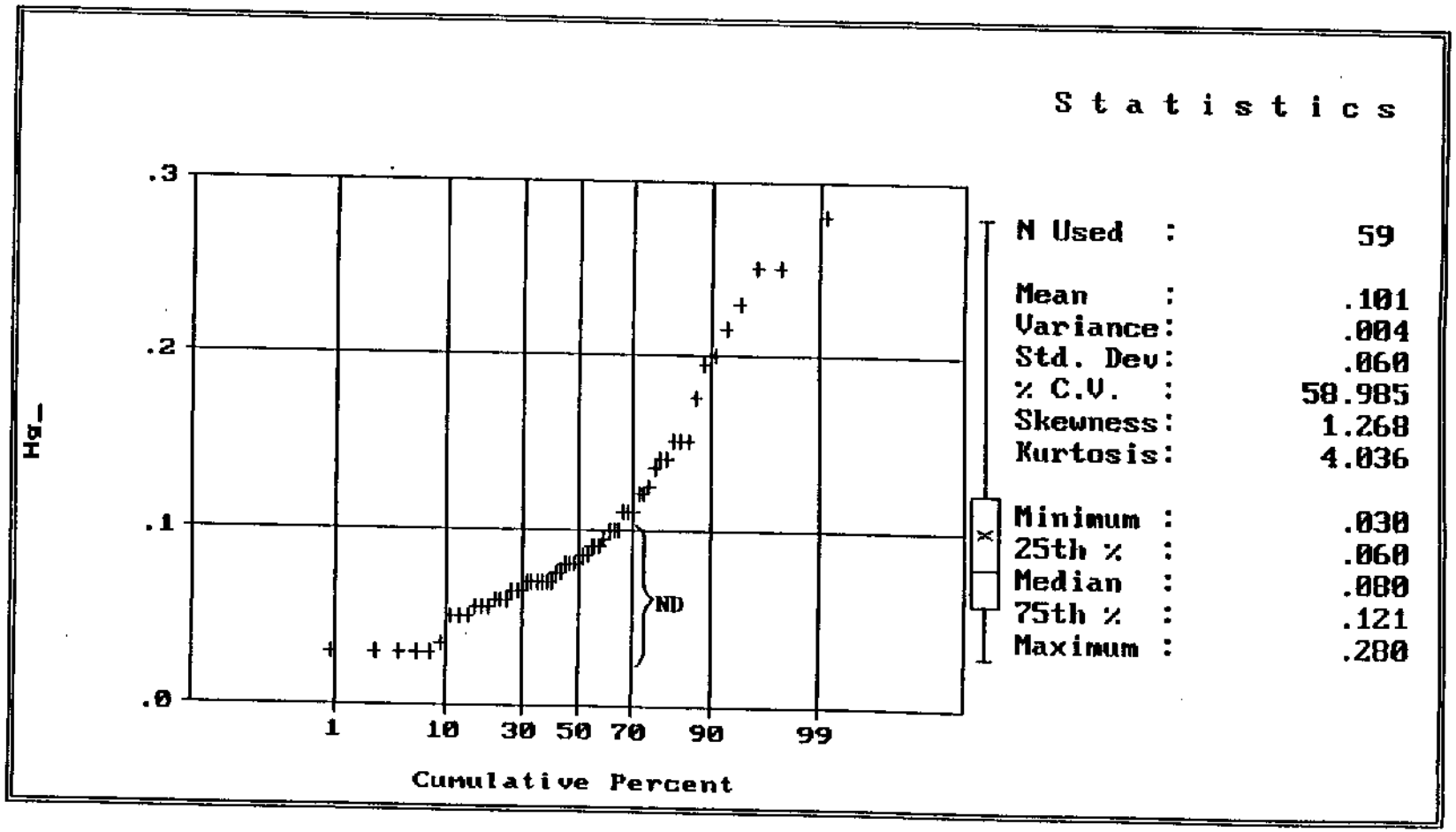
Note: The data set distribution is lognormal.

FIGURE 13: PROBABILITY PLOT OF MANGANESE CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



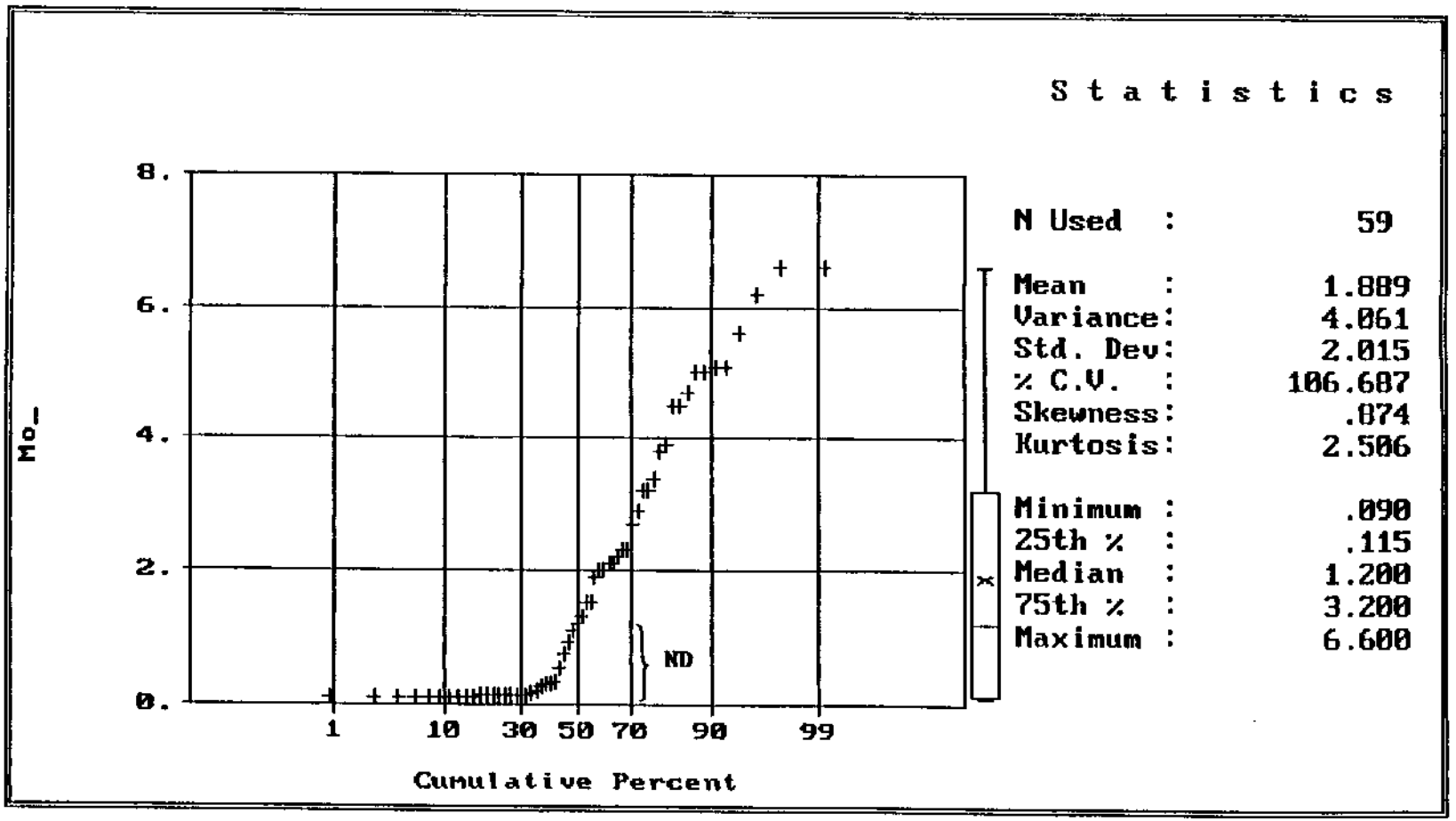
Note: The data set distribution is lognormal.

FIGURE 14: PROBABILITY PLOT OF MERCURY CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



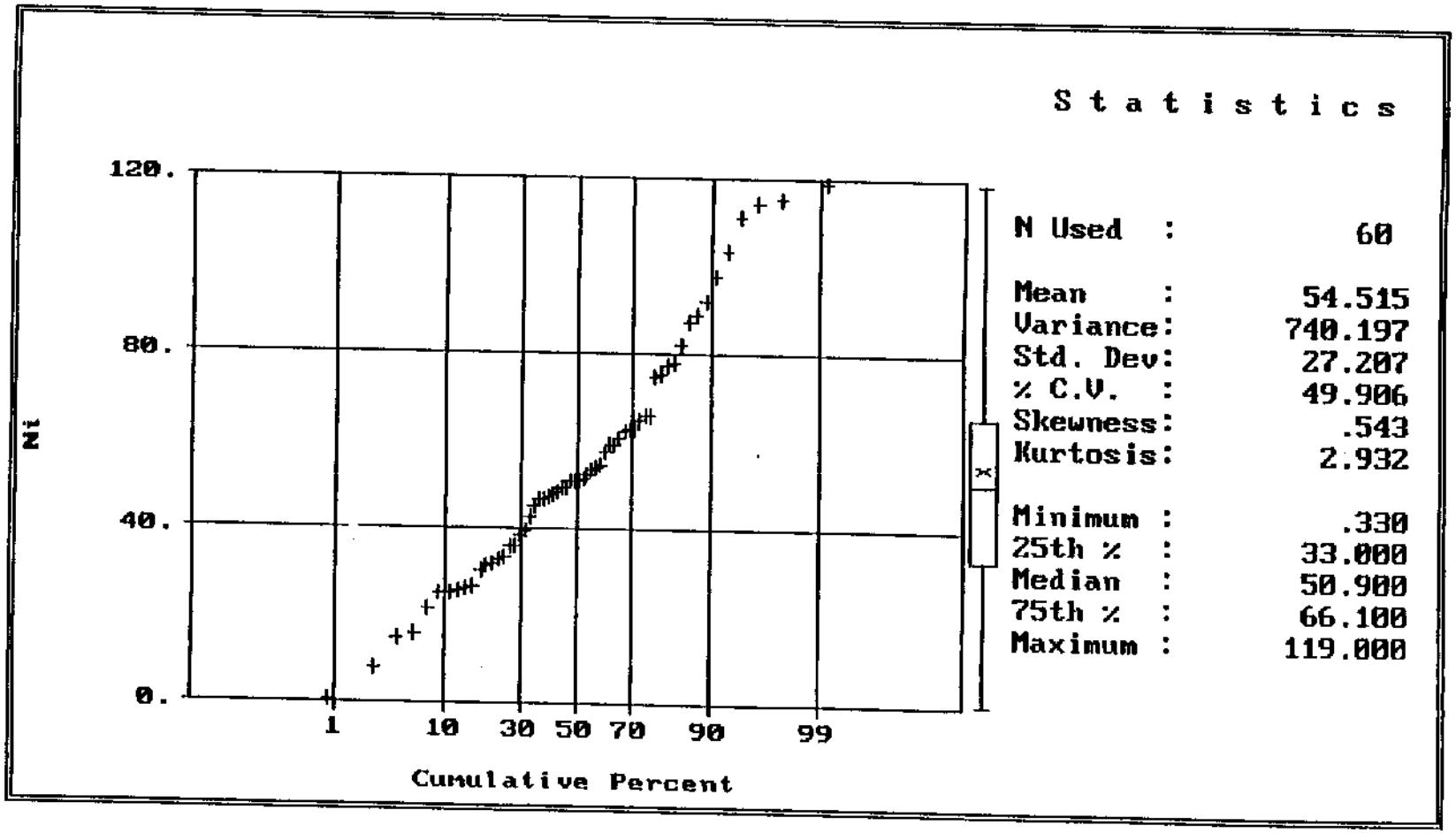
Note: The data set distribution is nonparametric.

FIGURE 15: PROBABILITY PLOT OF MOLYBDENUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



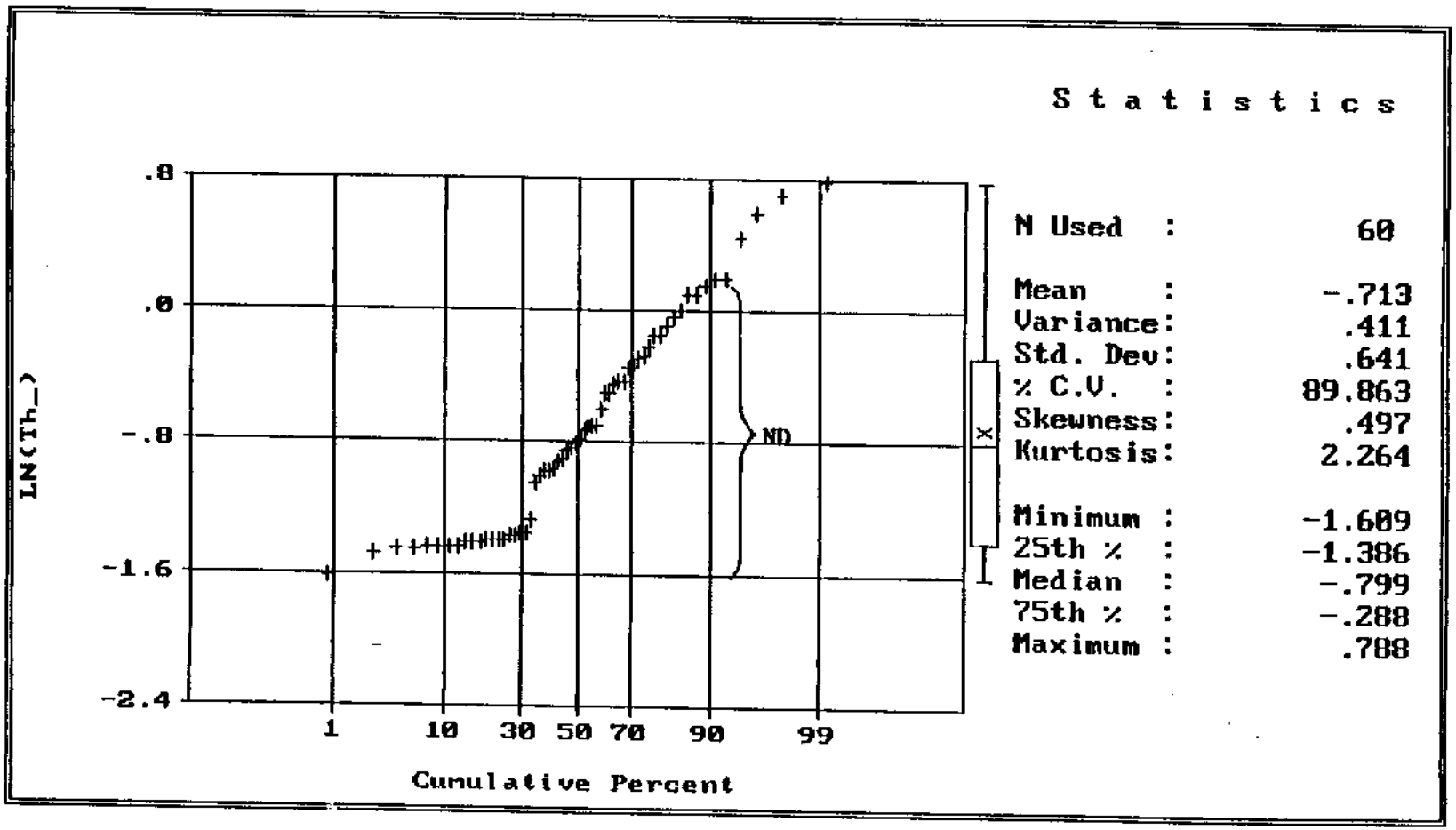
Note: The data set distribution is nonparametric.

FIGURE 16: PROBABILITY PLOT OF NICKEL CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES WPNSTA CONCORD



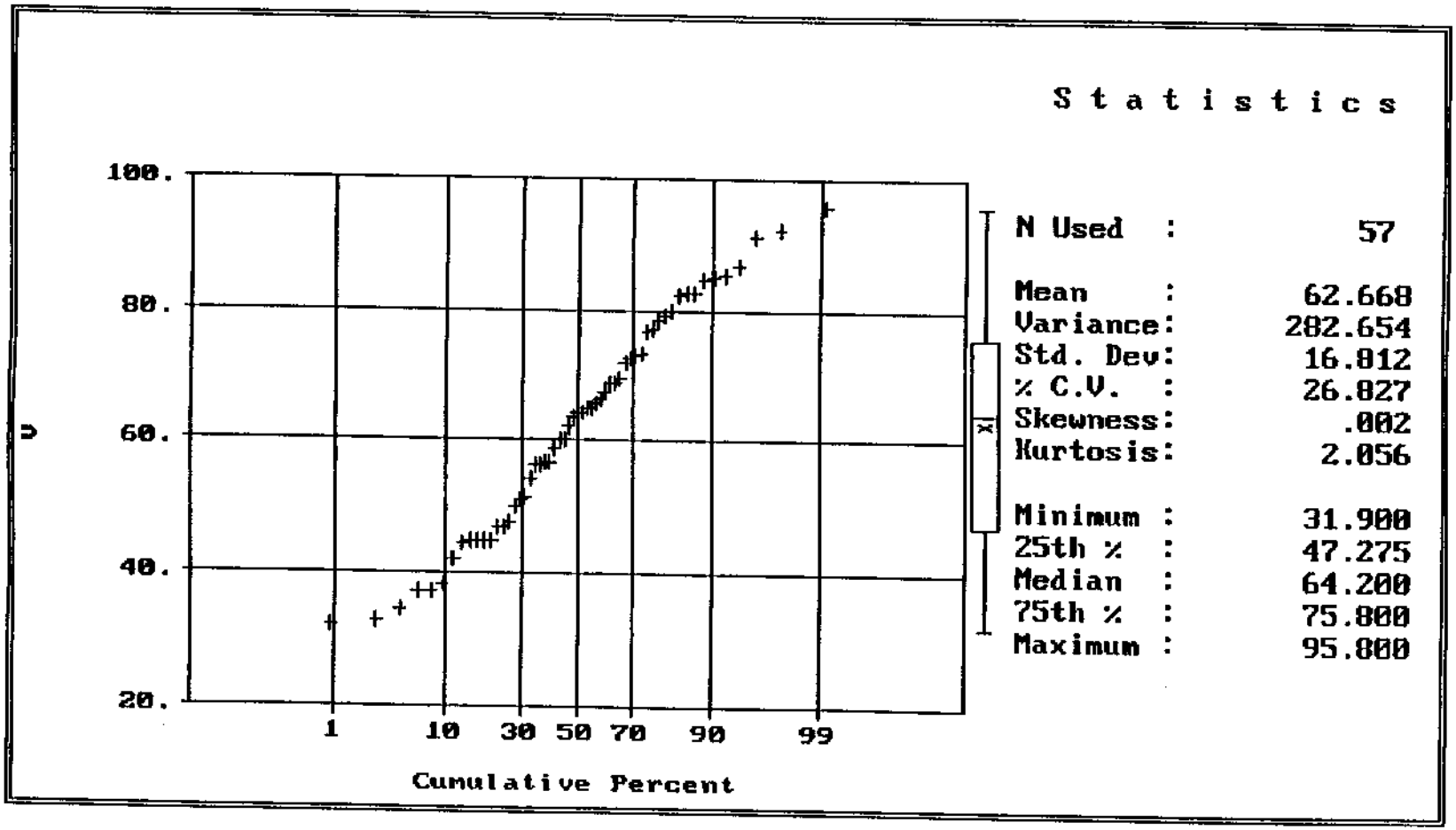
Note: The data set distribution is normal.

FIGURE 17: PROBABILITY PLOT OF THALLIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



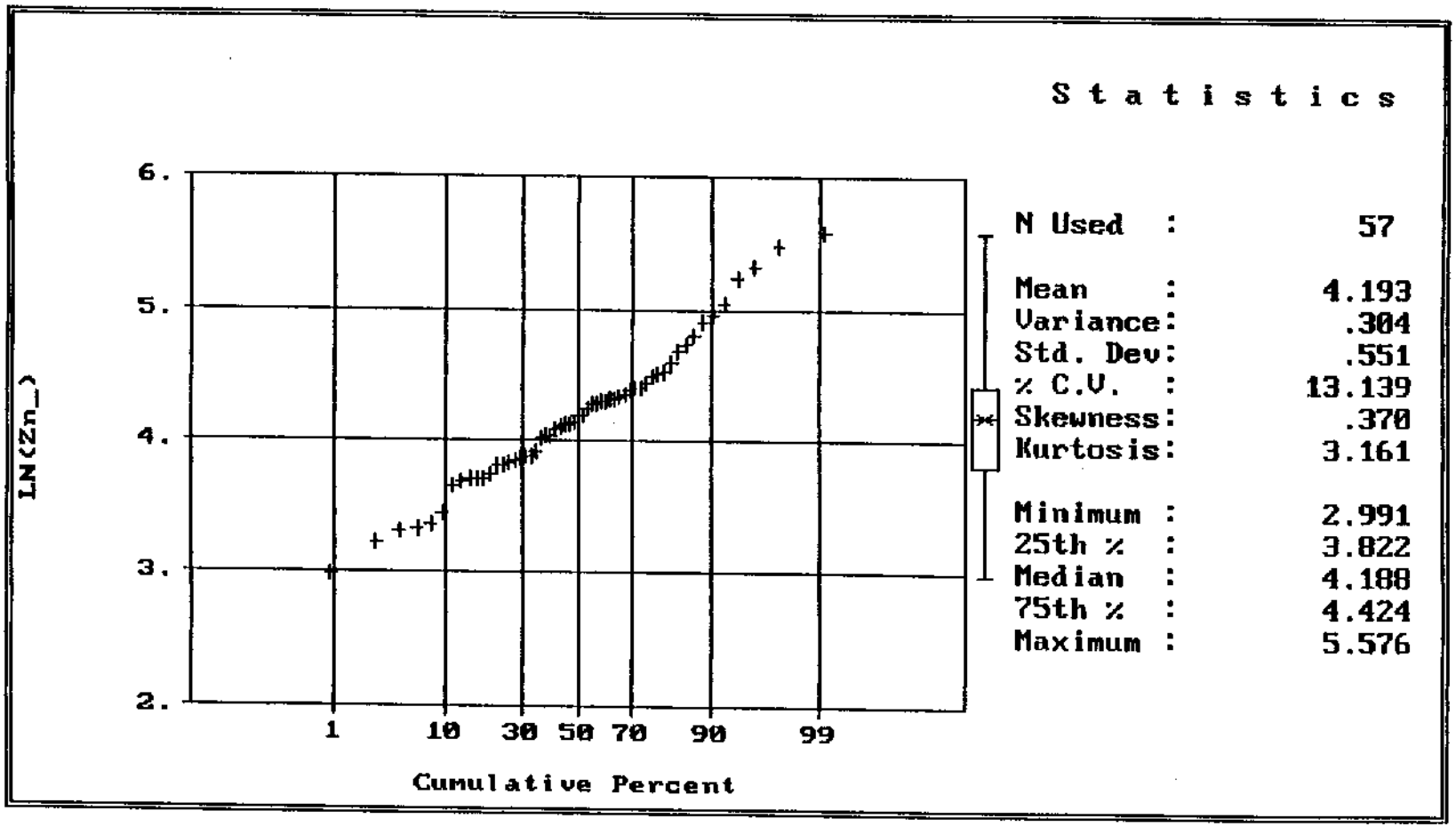
Note: The data set distribution is nonparametric.

FIGURE 18: PROBABILITY PLOT OF VANADIUM CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES WPNSTA CONCORD



Note: The data set distribution is normal.

FIGURE 19: PROBABILITY PLOT OF ZINC CONCENTRATIONS IN SOILS OF THE TIDAL AREA SITES
WPNSTA CONCORD



Note: The data set distribution is lognormal.

TABLES

TABLE 1. AMBIENT METALS CONCENTRATIONS IN SUBSURFACE SOILS OF THE TIDAL AREA SITES. NAVAL WEAPONS STATION CONCORD

Metal	Number of Detections/ Samples Analyzed	Values Excluded		Ambient Data Set Size[a]	Ambient Data Set Distribution	Soil Metal Concentration Statistics for Ambient Data Sets (mg/kg)						U.S. EPA PRG[g] (mg/kg)	ERM[l] (mg/kg)	RWQCB Sediment Screening Criterion[n] (mg/kg)
		Too Low	Too High			Minimum Detected[b]	Maximum Detected[c]	Mean	Standard Deviation	Coefficient of Variance	80% LCL on 95th p^e (Ambient Limit)			
Aluminum	61/61	0	0	61	Normal	82.2	27300	15, 184.5	6615.6	0.44	**26000**	77000	N/A	N/A
Antimony	13/50	2	2	46	Nonparam.	0.6	2.2	0.7[d]	N/A	N/A	**1.7**	31	N/A	N/A
Arsenic	51/61	2	2	57	Lognormal	2.3	40.1	9.7	9.3	0.41	**24**	0.38	70	33
Barium	61/61	1	1	59	Lognormal	18.5	529.0	111.6	109.8	0.19	**300**	5300	N/A	N/A
Beryllium	6/61	0	0	61	Nonparam.	0.11	0.18	0.04[d]	N/A	N/A	**0.12**	0.14	N/A	N/A
Cadmium	6/61	0	1	61	Nonparam.	0.2	1.9	0.05[d]	N/A	N/A	**0.29**	9.0[h]/38	9.6	5
Chromium	57/61	0	0	61	Normal	11.2	95.2	47.3	24.4	0.51	**81**	210[j]	370	220
Cobalt	59/61	2	2	57	Lognormal	1.7	35.6	12.7	8.1	0.24	**24**	4600	N/A	N/A
Copper	56/61	1	0	60	Lognormal	8.8	80.6	33.7	17.2	0.14	**59**	2800	270	90
Lead	58/61	2	2	57	Lognormal	1.9	176.0	17.8	20.1	0.37	**61**	130[h]/400	218	50
Manganese	61/61	1	1	59	Lognormal	4.3	1,470.0	352.8	295.7	0.13	**840**	3,200	N/A	N/A
Mercury	20/60	0	1	59	Nonparam.	0.07	0.28	0.08[d]	N/A	N/A	**0.22**	23[j]	0.71	0.35
Molybdenum	31/61	0	2	59	Nonparam.	0.35	6.6	1.2[d]	N/A	N/A	**5.4**	380	N/A	N/A
Nickel	61/61	0	1	60	Normal	0.3	119.0	54.5	27.2	0.49	**107**	150[h]/1,500	51.6	140
Selenium	2/61	0	0	61	Nonparam.	4.8	5.3	0.7[d]	N/A	N/A	**DL[f]**	380	1.4[m]	0.7
Silver	0/61	0	0	61	Nonparam.	N/A	N/A	0.12[d]	N/A	N/A	**DL[f]**	380	3.7	1
Thallium	6/61	0	1	60	Nonparam.	0.64	2.2	0.45[d]	N/A	N/A	**1.4**	5.4[k]	N/A	N/A
Vanadium	61/61	2	2	57	Normal	31.9	95.8	62.7	16.8	0.27	**86**	540	N/A	N/A
Zinc	56/61	1	3	57	Lognormal	27.5	264.0	77.1	45.9	0.13	**180**	23000	410	160

Notes:

a The ambient data set consists of both detected and nondetected results. Nondetected results are represented by values of one half the detection limit. The data set excludes anomalously low and high values.

b Minimum detected concentration in ambient data set, after exclusion of anomalously low values.

c Maximum detected concentration in ambient data set, after exclusion of anomalously high values.

d Mean values for nonparametric distributions were estimated as the 50th percentile of the distribution.

e Results were rounded to two significant figures.

f The ambient limit was set at the detection limit.

g U.S. Environmental Protection Agency (EPA) preliminary remediation goals (PRG) for residential use (September 1995).

h Cal-Modified PRG (EPA 1995).

i Represents the total chromium PRG, which assumes a 1/6 ratio of chromium VI/chromium III.

j Represents the mercuric chloride PRG.

k Represents the thallic oxide PRG.

l Effects-range median (ERM) (Long and others 1995).

m Sediment Screening Criteria for Wetlands Creation Noncover, from "Sediment Screening Criteria and Testing Requirements for Wetland Creation and Upland Beneficial Reuse" (Regional Water Quality Control Board [RWQCB] 1992).

n Sediment Screening Criteria for Wetlands Creation Cover, from "Sediment Screening Criteria and Testing Requirements for Wetland Creation and Upland Beneficial Reuse" (Regional Water Quality Control Board [RWQCB] 1992).

DL Detection limit.

N/A Not available.

APPENDIX G

BORING LOGS

TIDAL AREA LANDFILL SITE

BORING LOGS

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/31/95	DATE 7/31/95

LOG OF SOIL BORING: **TLSSB001**

Coordinates: **Tidal Area Landfill**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.4	ML		Clayey SILT, 10YR4/2, weak to moderate structure, medium stiff, poor gradation, moist, low plasticity, few pores and paths in between small roots, majority fines, wood pieces, metal	marsh sediment overlying landfill sediment
1		ML		SILT, 10YR2/1, weak structure, soft, poor gradation, wet, low plasticity, many pores and paths in between roots, majority fines	marsh/surface sediment
2					
3					
4					
5		CH		Fat Silty CLAY, 5Y4/1, 5Y3/1, strong structure, very stiff, poor gradation, moist, high plasticity, no pores and paths, majority fines, peat	marsh/surface sediment
6					
7				End of Boring at 7.0 ft	
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/31/95	DATE 7/31/95

LOG OF SOIL BORING: **TLSSB002**

Coordinates: **Tidal Area Landfill**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.2	ML		SILT, 10YR2/1, weak structure, soft, poor gradation, moist to wet, low plasticity, few pores and paths in between small roots, majority fines, wood pieces, peat; organic odor	marsh sediment overlying landfill sediment
5				End of Boring at 5.0 ft	

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/31/95	DATE 7/31/95

LOG OF SOIL BORING: **TLSSB003**

Coordinates: **Tidal Area Landfill**

SURFACE CONDITIONS: **pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.7	ML		SILT, 2.5Y3/2, weak structure, soft, poor gradation, damp, low plasticity, many pores and paths in between roots, peat, majority fines, wood pieces, peat; organic odor	marsh sediment overlying landfill sediment
1		ML		Clayey SILT, 10YR2/1, 10YR3/2, weak to moderate structure, medium stiff, poor gradation, moist, low plasticity, few pores and paths in between peat, majority fines, peat; organic odor	marsh/surface landfill sediment
2					
3					
4					
5					
6					
7				End of Boring at 7.0 ft	
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/31/95	DATE 7/31/95

LOG OF SOIL BORING: **TLSSB004**

Coordinates: **Tidal Area Landfill**

SURFACE CONDITIONS: **no vegetation**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.7	ML		SILT, 7.5YR3/1, weak structure, soft, poor gradation, moist, low plasticity, many pores and paths in between roots, majority fines, metal, evaporite deposits	marsh surface overlying landfill sediment
1		ML		Clayey SILT, 10YR3/2, weak to moderate structure, medium stiff, poor gradation, moist, low to medium plasticity, few pores and paths in between peat, majority fines, peat material; organic odor	marsh surface overlying landfill sediment
2				SILT, 10YR2/1, weak structure, soft, poor gradation, moist to wet, low plasticity, few pores and paths in between peat, roots, majority fines, peat material; organic odor	
3					
4					
5					
6					
7				End of Boring at 7.0 ft	
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

					START	FINISH
Water Level						
Time					TIME	TIME
Date					DATE 8/1/95	DATE 8/1/95

LOG OF SOIL BORING: **TLSSB005**

Coordinates: **Tidal Area Landfill**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
	0.5	ML		SILT, 10YR3/2, weak structure, soft, poor gradation, moist, low plasticity, many pores and paths in between roots, loose soil, majority fines, creosote soaked logs, metal scraps	marsh sediment overlying landfill sediment
		CL			marsh/surface landfill sediment
1		ML		Silty CLAY, 2.5Y4/2, moderate structure, medium stiff, poor gradation, moist, medium plasticity, few pores and pathes in between loose soil, rootlets, majority fines	marsh/surface landfill sediment
2				SILT, 7.5YR3/1, weak structure, soft, poor gradation, moist, low plasticity, few pores and pathes, in between loose soil, majority fines	
3					
4		CL		Silty CLAY, 10YR3/2, moderate structure, medium stiff, poor gradation, moist, medium plasticity, few pores and pathes in between peat, majority fines, peat material; strong sulfur odor	marsh/surface landfill sediment
5					
6					
7				End of Boring at 7.0 ft	
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/1/95	DATE 8/1/95

LOG OF SOIL BORING: **TLSSB006**

Coordinates: **Tidal Area Landfill**

SURFACE CONDITIONS: **sparse grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	1.0	ML		SILT, jet black, weak structure, very soft, poor gradation, wet, low plasticity, few pores and paths in between roots, majority fines, jet black organic matter; organic odor	marsh sediment overlying landfill sediment
		GC		Clayey Sandy GRAVELS, SANDSTONE, 10YR4/4, weak structure, loose, poor gradation, wet, low plasticity, many pores and paths in between gravels, loose, rocky soil, 40% fines, gravels, gravels up to 2" in diameter	landfill sediment/gravels from nearby road
1		CH		Fat Silty CLAY, 5Y3/1, moderate to strong structure, stiff, poor gradation, moist, high plasticity, few pores and paths in between peat, majority fines, peat material	emplaced soil
2					
3					
4					
5					
6				End of Boring at 6.0 ft	
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/1/95	DATE 8/1/95

LOG OF SOIL BORING: **TLSSB007**

Coordinates: **Tidal Area Landfill**

SURFACE CONDITIONS: **pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.0	ML		Clayey SILT, 2.5Y3/1, weak structure, soft, poor gradation, moist, medium plasticity, many pores and paths in between roots, branches, majority fines, wood, white natural deposits in the soil	marsh sediment overlying landfill sediment
		ML		SILT, 2.5Y2.5/1, 10YR2/1, weak structure, soft, poor gradation, damp, low plasticity, many pores and paths in between rootlets, roots, majority fines, peat material at 4' bgs; organic odor	marsh/surface landfill sediment
1					
2					
3					
4					
5				End of Boring at 5.0 ft	
6					
7					
8					
9					
10					

\2738 ID: WALNUT1

MONTGOMERY WATSON

365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

DRILLING AND SAMPLING METHODS: Hand Geoprobe

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/1/95	DATE 8/1/95

LOG OF SOIL BORING: **TLSSB008**

Coordinates: **Tidal Area Landfill**

SURFACE CONDITIONS: **pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.0	CL/CH		Fat Silty CLAY, 2.5Y2.5/1, moderate to strong structure, medium soft, poor gradation, wet to damp, medium to high plasticity, few pores and paths in between roots, peat, majority fines, logs, concrete, metal, wood, peat material; organic odor	marsh sediment overlying landfill sediment
1				End of Boring at 0.5 ft	
2					
3					
4					
5					
6					
7					
8					
9					
10					

\2738 ID: WALNUT1

R AREA DISPOSAL SITE

BORING LOGS

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/3/95	DATE 8/3/95

LOG OF SOIL BORING: **RADSBB04**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **sluice**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	2.4	ML		Clayey SILT, 10YR3/1, weak structure, soft, poor gradation, wet, low plasticity, many pores and paths, saturated sediment, majority fines, metal ammunition casing	former wetlands/surface sediment
2		ML		SILT, 2.5Y3/1, weak structure, very soft, poor gradation, moist, very low plasticity, many pores and paths in peat, roots, majority fines, decayed organic odor; peat material	former wetlands sediment
6				End of Boring at 6.0 ft	

MONTGOMERY WATSON

365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

DRILLING AND SAMPLING METHODS: Hand Geoprobe

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/3/95	DATE 8/3/95

LOG OF SOIL BORING: **RADSBB06**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **no vegetation**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	1.6	ML		Clayey SILT, 10YR3/2, moderate structure, medium stiff, poor gradation, moist, medium plasticity, many pores and paths in between roots, wood chips, majority fines, wood, sand, wood chips to 0.5'	surface sediment overlying former wetlands sediment
0.5		SW		Fine Grained SAND, 2.5Y4/2, weak structure, medium dense, well gradation, moist, nonplastic, many pores and paths in between sand grains, 10% fines, sand	surface sediment overlying wetlands sediment
1		CH		Fat, Silty CLAY, 5Y3/1, strong structure, stiff, poor gradation, moist, medium plasticity, few pores and paths in between peat, majority fines, peat material	wetlands sediment
2				End of Boring at 2.0 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON

365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

DRILLING AND SAMPLING METHODS: Hand Geoprobe

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/1/95	DATE 8/1/95

LOG OF SOIL BORING: **RADSBB08**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: grasses

GEOLOGIST: Y.LEUNG

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		ML		Compacted SILT with Sand, 10YR4/4, moderate structure, hard, poor gradation, dry, nonplastic, few pores and paths, worm holes, loose sand, majority fines, metal ammunition casing, metal pallet, wood, soil extremely hard to geoprobe	surface sediment berm area
1					
2					
2.5		SM		Silty SAND, 5Y4/2, weak structure, medium dense, poor gradation, moist, low plasticity, few pores and paths, loose sand, 25% fines	surface sediment berm area
3				End of Boring at 3.0 ft	
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/4/95	DATE 8/4/95

LOG OF SOIL BORING: **RADSBC05**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	1.7	SP		Fine to Medium Grained SAND, 10YR 4/3, weak structure, loose, poor gradation, moist, nonplastic, many pores and paths in between sand grains, 10% fines, wood, metal ammunition casings	surface sediment overlying former wetlands sediment
		CL			surface sediment overlying former wetlands sediment
1				Silty CLAY, 10YR3/2, moderate structure, medium stiff, poor gradation, moist, medium plasticity, few pores and paths in saturated sediment, majority fines	
2		ML		SILT, 10YR3/3, weak structure, very soft, poor gradation, moist, low plasticity, many pores and paths in between peat, majority fines, peat material	former wetlands sediment
3				End of Boring at 2.3 ft	
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/4/95	DATE 8/4/95

LOG OF SOIL BORING: **RADSBD05**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	2.7	ML		SILT, 2.5Y3/2, weak structure, very soft, poor gradation, damp, nonplastic, many pores and paths in between roots, branches, grass, majority fines, pickle weed	surface sediment overlying former wetlands sediment
1		CL		Silty CLAY, 2.5Y5/2, moderate structure, stiff, poor gradation, damp, medium plasticity, few pores and paths in between peat, roots, majority fines, peat material has iron staining/orange staining	former wetlands sediment
2				End of Boring at 2.0 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

LOG OF SOIL BORING: **RADSBD06** Coordinates: **R Area Disposal Site**					START	FINISH
	Water Level					
	Time				TIME	TIME
	Date				DATE 8/4/95	DATE 8/4/95

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG	SURFACE CONDITIONS: pickle weed GEOLOGIST: Y.LEUNG	FEATURES/REMARKS
0	4.0	CL		Silty CLAY, 10YR4/3, moderate structure, stiff, poor gradation, damp, low plasticity, few pores and paths in between small roots, cracked sediment, majority fines, pickle weed	surface sediment overlying former wetlands sediment
4		CH		Fat Silty CLAY, 5Y4/1, moderate structure, very stiff, poor gradation, damp, high plasticity, no pores and paths, majority fines, peat material	(emplaced soil)
7				End of Boring at 7.0 ft	

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/23/95	DATE 8/23/95

LOG OF SOIL BORING: **RADSBE03**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.0	CL		Silty CLAY, 10YR4/3, moderate structure, medium stiff, poor gradation, moist, medium plasticity, few pores and paths in between rootlets, majority fines	fill material deposits interbedded with former wetlands sediment
1		ML		SILT, 2.5Y3/1, weak structure, soft, poor gradation, moist, low plasticity, many pores and paths in between rootlets, majority fines, peat material	former wetlands sediment
2				End of Boring at 2.0 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/23/95	DATE 8/23/95

LOG OF SOIL BORING: **RADSBG04**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **dry grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.0	ML		Clayey SILT, 2.5Y5/3, weak structure, soft, poor gradation, damp, low plasticity, few pores and paths in between peat particles, majority fines, fill material in square patch along pipeline, peat material; decayed with iron/orange staining	fill material placed along a square patch
1		ML		SILT, 2.5Y2.5/1, weak structure, very soft, poor gradation, moist, low to non plastic, few pores and paths in between peat, majority fines, peat material; slight organic odor	former wetlands sediment
2					
3		CL		Silty CLAY, 2.5Y4/1, moderate structure, medium stiff, poor gradation, moist, medium plasticity, few pores and paths in between peat, majority fines, peat material; organic odor	former wetlands sediment (emplaced)
4					
5					
6					
7					
8		CH		Fat CLAY, moderate to strong structure, medium stiff, poor gradation, moist, high plasticity, few pores and paths in between peat, majority fines, peat material	emplaced soil (bay mud)
9				End of Boring at 8.1 ft	
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

					START	FINISH
Water Level						
Time					TIME	TIME
Date					DATE 8/21/95	DATE 8/21/95

LOG OF SOIL BORING: **RADSBG08**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **berm area**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.8	CL		Silty Sandy CLAY with Gravel, 10YR3/1, weak structure, soft, poor gradation, dry/damp, low plasticity, many pores and paths in between gravels, majority fines, fill material; steel	fill material from berm area that separates sluice and former ephemeral pond
1		CL		Silty CLAY, 2.5Y4/2, moderate structure, stiff, poor gradation, damp, medium plasticity, few pores and paths in between small roots, majority fines, fill material	fill material from berm area that separates sluice and former ephemeral pond
2					
3		ML		SILT, 10YR2/2, weak structure, soft, poor gradation, damp/moist, low plasticity, few pores and paths in between peat, roots, loose sediment, majority fines, possible reddish brick or clay material, strong sulfur smell	former wetlands sediment
4	1.7				
5					
6					
7				End of Boring at 7.0 ft	
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

					START	FINISH
Water Level						
Time					TIME	TIME
Date					DATE 7/27/95	DATE 7/27/95

LOG OF SOIL BORING: **RADSBH06**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	3.0	CH		Fat Silty CLAY, 2.5Y4/2, moderate structure, stiff, poor gradation, moist, medium plasticity, many pores and paths in between peat, majority fines, pipeline 45' from location, peat, mild sulfur odor	former wetlands/surface sediment
1					
2				End of Boring at 2.0 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/27/95	DATE 7/27/95

LOG OF SOIL BORING: **RADSBI04**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	2.2	ML		Clayey SILT, 10YR3/2, weak to moderate structure, medium stiff, poor gradation, moist, low plasticity, many pores and paths in between roots, majority fines, peat, mild sulfur odor	former wetlands/surface sediment
1		CL		Silty CLAY, 5Y2.5/1, weak to moderate structure, medium stiff, poor gradation, moist, low plasticity, many pores and paths in between roots, majority fines, peat, mild sulfur odor	former wetlands/surface sediment
2				End of Boring at 2.0 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/27/95	DATE 7/27/95

LOG OF SOIL BORING: **RADSBI08**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **sparse grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	2.0	ML		Clayey SILT, 10YR3/2, weak structure, very soft, poor gradation, wet, low plasticity, many pores and paths in between peat, majority fines, gravels, area may have been cut in half connecting the two ephermeral ponds	ephemeral pond sediment
1		CL		Silty CLAY, 5Y2.5/1, moderate structure, medium stiff, poor gradation, moist, low plasticity, many pores and paths in between peat, majority fines, some gravels	ephemeral pond sediment
2					
3					
4				End of Boring at 4.0 ft	
5					
6					
7					
8					
9					
10					

\2738 ID: WALNUT1

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

LOG OF SOIL BORING: **RADSBJ02**						START	FINISH
Coordinates: **R Area Disposal Site**	Water Level						
	Time					TIME	TIME
	Date					DATE 8/23/95	DATE 8/23/95

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG	SURFACE CONDITIONS: **fill material from railroad** GEOLOGIST: **Y.LEUNG**	FEATURES/REMARKS
0	0.5	SM		Fine Silty SAND, 2.5Y4/4, weak structure, medium dense, poor gradation, damp, nonplastic, many pores and paths in between sand, 15% fines, sand fill material; wood	fill material from surrounding railroad berms
1					
		SW		Medium to Coarse SAND, Mica, 2.5Y4/4, weak structure, loose, well gradation, damp, nonplastic, many pores and paths in between sand, 10% fines, sand fill material	fill material from surrounding railroad berms
2					
		CL		Silty CLAY, 10YR5/3, strong structure, stiff, poor gradation, moist, medium to high plasticity, no pores and paths, majority fines	fill material from surrounding railroad berms
3		ML		SILT, 10YR2/1, weak structure, very soft, poor gradation, moist, low plasticity, many pores and paths in between rootlets, majority fines, peat material	former wetlands sediment
4					
		CH		Fat CLAY, GLEY4/5GY, GLEY4/10GY, strong structure, very stiff, poor gradation, moist, high plasticity, few pores and paths in between rootlets, majority fines, peat material	emplaced soil (bay mud)
5					
6					
7				End of Boring at 7.0 ft	
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

					START	FINISH
Water Level						
Time					TIME	TIME
Date					DATE 7/27/95	DATE 7/27/95

LOG OF SOIL BORING: **RADSBK08**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **berm with dry grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		ML		Clayey SILT with Sand and Gravel, 10YR4/2, weak to moderate structure, hard, poor gradation, dry, nonplastic, many pores and paths in between gravels, sand, grass roots, majority fines, wood pieces, nails	fill material from berm area
		CL		Silty CLAY, 2.5Y5/3, weak structure, medium stiff, poor gradation, damp, low plasticity, few pores and paths in between gravels, majority fines, gravels	former wetlands
1					
2		CL		Silty CLAY, 2.5Y3/1, moderate structure, medium stiff, poor gradation, damp, medium plasticity, no pores and paths, majority fines, possible hydrocarbon odor	former wetlands
3				End of Boring at 2.5 ft	
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/27/95	DATE 7/27/95

LOG OF SOIL BORING: **RADSBM08**

Coordinates: **R Area Disposal Site**

SURFACE CONDITIONS: **grassy ridge**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.0	CH		Fat Silty CLAY, 2.5Y4/2, moderate structure, stiff, poor gradation, moist, medium to high plasticity, no pores and paths, majority fines, wood pieces	former wetlands/surface fill sediment
1					
	3.5				
2		CH		Fat Silty CLAY, 2.5Y3/1, moderate structure, stiff, poor gradation, moist, medium to high plasticity, no pores and paths, majority fines	former wetlands/surface sediment
3				End of Boring at 2.3 ft	
4					
5					
6					
7					
8					
9					
10					

\2738 ID: WALNUT1

FROID AND TAYLOR ROADS SITE

BORING LOGS

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/5/95	DATE 7/5/95

LOG OF SOIL BORING: **FTSSB001**

Coordinates: **Froid & Taylor Site**

SURFACE CONDITIONS: **dry grass/fill material**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		ML		SILT with Medium to Fine Sand & Humus, 10YR 5/2, mod. structure, very soft, poor gradation, dry, nonplastic, many pores in between worm holes, fox holes, crevesses in between concrete, majority fines, iron banding wire, asphalt, PVC pipe, vegetation change	surface sediment overlying emplaced soil
1		CH		Fat CLAY with Sand, 10YR3/2, moderate structure, very soft, poor gradation, moist, high plasticity, few pores and paths, majority fines, concrete	emplaced soil (bay mud)
2				End of Boring at 1.3 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON

365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

DRILLING AND SAMPLING METHODS: Hand Geoprobe

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/5/95	DATE 7/5/95

LOG OF SOIL BORING: **FTSSB002**

Coordinates: **Froid & Taylor Site**

SURFACE CONDITIONS: **tall grass/pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		ML		SILT with Medium to Fine Sand and Humus, 10YR2/1, weak structure, very soft, poor gradation, moist, low plasticity, many pores between humus and between grains, majority fines, corroded 2x4" (9V) bolt batteries, white/black corrosion on surface	intertidal marsh/surface sediment
1		CH		Fat CLAY with Sand, 10YR3/2, moderate structure, very soft, poor gradation, moist, high plasticity, few pores and paths, majority fines	emplaced soil (bay mud)
2				End of Boring at 1.8 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON
365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

DRILLING AND SAMPLING METHODS: **Hand Geoprobe**

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/5/95	DATE 7/5/95

LOG OF SOIL BORING: **FTSSB003**

Coordinates: **Froid & Taylor Site**

SURFACE CONDITIONS: **tall grass/pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		ML		SILT with Medium to Fine Sand and Humus, 5YR5/6-surface, 10YR2/1, weak structure, very soft, poor gradation, moist, low plasticity, many pores between humus and between grains, majority fines, rusty brown stain on grass/wood chips, depression - 3'x3' stain	intertidal marsh/surface sediment
1		CH		Fat CLAY with Sand, 10YR 3/2, moderate structure, very soft, poor gradation, moist, high plasticity, few pores and paths, majority fines	emplaced soil (bay mud)
2				End of Boring at 1.75 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/6/95	DATE 7/6/95

LOG OF SOIL BORING: **FTSSB004**

Coordinates: **Froid & Taylor Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		CL		Lean CLAY with Sand, 7.5YR4/1, moderate structure, very soft, poor gradation, moist, high plasticity, few pores and paths, pore spaces between sediment, majority fines, clayey sediment in boring	intertidal marsh/surface sediment
		CH		Fat CLAY, 7.5YR4/1, moderate structure, soft, poor gradation, wet, high plasticity, few to no pores and paths, majority fines	emplaced soil (bay mud)
1					
2				End of Boring at 2.0 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON

365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

DRILLING AND SAMPLING METHODS: Hand Geoprobe

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/6/95	DATE 7/6/95

LOG OF SOIL BORING: **FTSSB005**

Coordinates: **Froid & Taylor Site**

SURFACE CONDITIONS: **grasses/pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		CL		Silty CLAY with Sand, 10YR2/1, moderate structure, very soft, poor gradation, moist to wet, high plasticity, few pores and paths in betw sediment, majority fines, jet black organic soil beneath surface w/decaying odor	intertidal marsh/surface sediment
3				End of Boring at 3.0 ft	

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/6/95	DATE 7/6/95

LOG OF SOIL BORING: **FTSSB006**

Coordinates: **Frold & Taylor Site**

SURFACE CONDITIONS: **grasses/pickle weed**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		CL		Silty CLAY with Sand, 10YR2/1, moderate structure, very soft to soft, poor gradation, moist to wet, high plasticity, few pores and paths, pores space betw sediment, majority fines, jet black organic soil beneath surface w/decaying odor	intertidal marsh/surface sediment
3				End of Boring at 3.0 ft	

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

LOG OF SOIL BORING: **FTSSB007**					START	FINISH
Coordinates: **Froid & Taylor Site**	Water Level					
	Time				TIME	TIME
	Date				DATE 7/6/95	DATE 7/6/95

SURFACE CONDITIONS: **no vegetation/evaporite deposits**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
1		~~SC~~ CL		Clayey SAND, Evaporite Deposits, 10YR5/6, 10YR6/6, weak structure, stiff, poor gradation, moist, low plasticity, few pores and paths, pore spaces between sediment, 25% Fines, iron colored, black and olive banding concentric in deposition/evaporite deposits	intertidal marsh sediment with slightly higher energy of deposition
2				Sandy Lean CLAY, Pieces of Sandstone, 10YR5/6, 10YR6/6, strong structure, very hard, poor gradation, damp to dry, medium plasticity, few pores and paths, pore spaces between sediment, majority fines, compacted sand pieces up to 1 cm in diameter	intertidal marsh sediment with slightly higher energy of deposition
3				End of Boring at 3.0 ft	
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

LOG OF SOIL BORING: **FTSSB008** Coordinates: **Froid & Taylor Site**					START	FINISH
	Water Level					
	Time				TIME	TIME
	Date				DATE 7/6/95	DATE 7/6/95

SURFACE CONDITIONS: **fill material nearby manma**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
1		CL		Silty CLAY with Sand, 10YR2/1, weak structure, very soft, poor gradation, moist to wet, low plasticity, many pore spaces betw sediment, majority fines, jet black organic soil beneath surface w/decaying odor	intertidal water depositing sediment into manmade gully during high waters
2				End of Boring at 1.75 ft	
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON

365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

DRILLING AND SAMPLING METHODS: Hand Geoprobe

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/6/95	DATE 7/6/95

LOG OF SOIL BORING: **FTSSB009**

Coordinates: **Froid & Taylor Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
1		CL		Silty CLAY with Sand and Gravel, 2.5Y6/4, weak structure, very soft, moderate gradation, wet, low plasticity, many pores and paths in worm holes, majority fines, nearby concrete and gravel, water at ~6" from ground surface, lots of worms	emplaced soil
				End of Boring at 1.3 ft	
2					
3					
4					
5					
6					
7					
8					
9					
10					

WOOD HOGGER SITE

BORING LOGS

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Geoprobe		
		Water Level	START	FINISH
LOG OF SOIL BORING: **WHSSB201**		Time	TIME	TIME
Coordinates: **Wood Hogger Site**		Date	DATE: 8/28/95	DATE: 8/29/95

SURFACE CONDITIONS: **road base**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		ASPHAL		ASPHALT, strong structure, dense, poor gradation, dry, nonplastic, few pores and paths in between small cracks	asphalt; manmade
		GW		GRAVELS up to 3/4", weak structure, loose, well gradation, wet, nonplastic, many pores and paths in between gravels, <10% fines, gravel road base	fill material from leveling and stabilizing area near Wood Hogger
1		CH		Fat CLAY with Sand and Gravel, 10YR6/6, moderate structure, stiff, poor gradation, moist, high plasticity, no pores and paths, majority fines, fill material	fill material; silty peat material probably excavated to add more stable fill material
2		GM/SM		GRAVELS and Coarse SAND, 5Y4/1, weak structure, loose, poor gradation, saturated, low plasticity, many pores and paths in between gravels, sand, 15% fines, floating product; motor oil ~1cm, strong hydrocarbon odor though HNU does not indicate	fill material; silty peat material probably excavated to add more stable fill material
3		CL		Sandy CLAY with Gravel, 5Y5/2, moderate structure, stiff, poor gradation, moist, medium plasticity, few pores and paths in between gravels, majority fines, fill material	fill material; silty peat material probably excavated to add more stable fill material
4					
5					
6					
7					
8		CL		Sandy CLAY, 2.5Y5/3, moderate structure, very stiff, poor gradation, damp, low plasticity, few pores and paths in between sand, majority fines, calcite nodules	emplaced soil
9				End of Boring at 8.0 ft	
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/31/95	DATE 8/31/95

LOG OF SOIL BORING: **WHSSB202**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **road base**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		FILL/GM		ASPHALT and Silty GRAVELS, 5Y4/1, weak structure, loose, poor gradation, damp, nonplastic, many pores and paths in between gravels, 30% fines	fill material from leveling and stabilizing area near Wood Hogger
1		CL		Sandy CLAY with Gravels, 10YR5/4, moderate structure, medium stiff, poor gradation, damp, low to medium plasticity, few pores and paths in between sand, majority fines, fill material	fill material; silty peat material probably excavated to add more stable fill material
2					
3					
4		GM/SM		Silty Coarse SAND and GRAVELS, 5Y4/2, weak structure, loose, poor gradation, saturated, low plasticity, many pores and paths in between gravels and sand, 25% fines, fill material, strong hydrocarbon odor though HNU does not indicate	fill material; silty peat material probably excavated to add more stable fill material
5				End of Boring at 5.5 ft	
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/31/95	DATE 8/31/95

LOG OF SOIL BORING: **WHSSB203**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **road base**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		FILL/GM		ASPHALT and Silty GRAVELS, 5Y4/1, weak structure, loose, poor gradation, damp, nonplastic, many pores and paths in between gravels, 30% fines	fill material from leveling and stabilizing area near Wood Hogger
1		CL		Sandy CLAY with Gravels, 10YR5/4, moderate structure, medium stiff, poor gradation, damp, low to medium plastic, few pores and paths in between sand, majority fines, fill material	fill material; silty peat material probably excavated to add more stable fill material
4		GM/SM		Silty Coarse SAND and GRAVELS, 5Y4/2, weak structure, loose, poor gradation, saturated, low plasticity, many pores and paths in between gravels and sand, 25% fines, black tar from former road construction, hydrocarbon odor	fill material; silty peat material probably excavated to add more stable fill material
5.5				End of Boring at 5.5 ft	
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/31/95	DATE 8/31/95

LOG OF SOIL BORING: **WHSSB204**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **road base**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0		FILL/GM		ASPHALT and Silty GRAVELS, 5Y4/1, weak structure, loose, poor gradation, damp, nonplastic, many pores and paths in between gravels, 30% fines	fill material from leveling and stabilizing area near Wood Hogger
1		CL		Sandy CLAY with Gravels, 10YR5/4, moderate structure, medium stiff, poor gradation, damp, low to medium plasticity, few pores and paths in between sand, majority fines, fill material	fill material; silty peat material probably excavated to add more stable fill material
2					
3					
4		GM/SM		Silty Coarse SAND and GRAVELS, 5Y4/2, weak structure, loose, poor gradation, saturated, low plasticity, many pores and paths in between gravels and sand, 25% fines, fill material, slight hydrocarbon odor	fill material; silty peat material probably excavated to add more stable fill material
5				End of Boring at 5.5 ft	
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/25/95	DATE 8/25/95

LOG OF SOIL BORING: **WHSSBA06**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **berm/dry grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	1.1	SP		SAND and GRAVEL, 10YR3/2, weak structure, very loose, poor gradation, dry, nonplastic, many pores and paths in between sand, gravels, 10% fines, fill material from berm, sample collected after berm fill material	fill material from berm area
1		CL		Sandy CLAY, 10YR5/4, moderate structure, medium stiff, poor gradation, damp, low plasticity, few pores and paths in between sand, minerals, majority fines, calcite nodule, red rock with clear striated mineral	fill material; silty peat material probably excavated to add more stable fill material
2				No Recovery	
3					
4					
5		SM		Silty SAND with 10% Small Gravels, 5Y5/2, weak to moderate structure, medium dense, well graded, wet, nonplastic, many pores and paths in between sand grains and gravels, 20% fines	fill material; silty peat material probably excavated to add more stable fill material
		CL		Sandy CLAY with Gravel, 5Y5/3, moderate structure, stiff, poor gradation, moist, medium plasticity, majority fines	emplaced soil
6		CL		Sandy CLAY, 2.5Y5/3, weak to moderate structure, medium stiff, well gradation, moist, low plasticity, majority fines	emplaced soil
7					
8		CL		Sandy CLAY, Chromium, Calcite Nodules, 5Y4/1, 10YR5/4, moderate structure, medium stiff, poor gradation, moist, low plasticity, no pores and paths, majority fines	emplaced soil
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		LOG OF SOIL BORING: **WHSSBA06**		

Sandy CLAY continued

11
12
13
14

End of Boring at 14.0 ft

15
16
17
18
19
20
21

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/11/95	DATE 8/11/95

LOG OF SOIL BORING: **WHSSBC02**

Coordinates: **Wood Hogger Site**

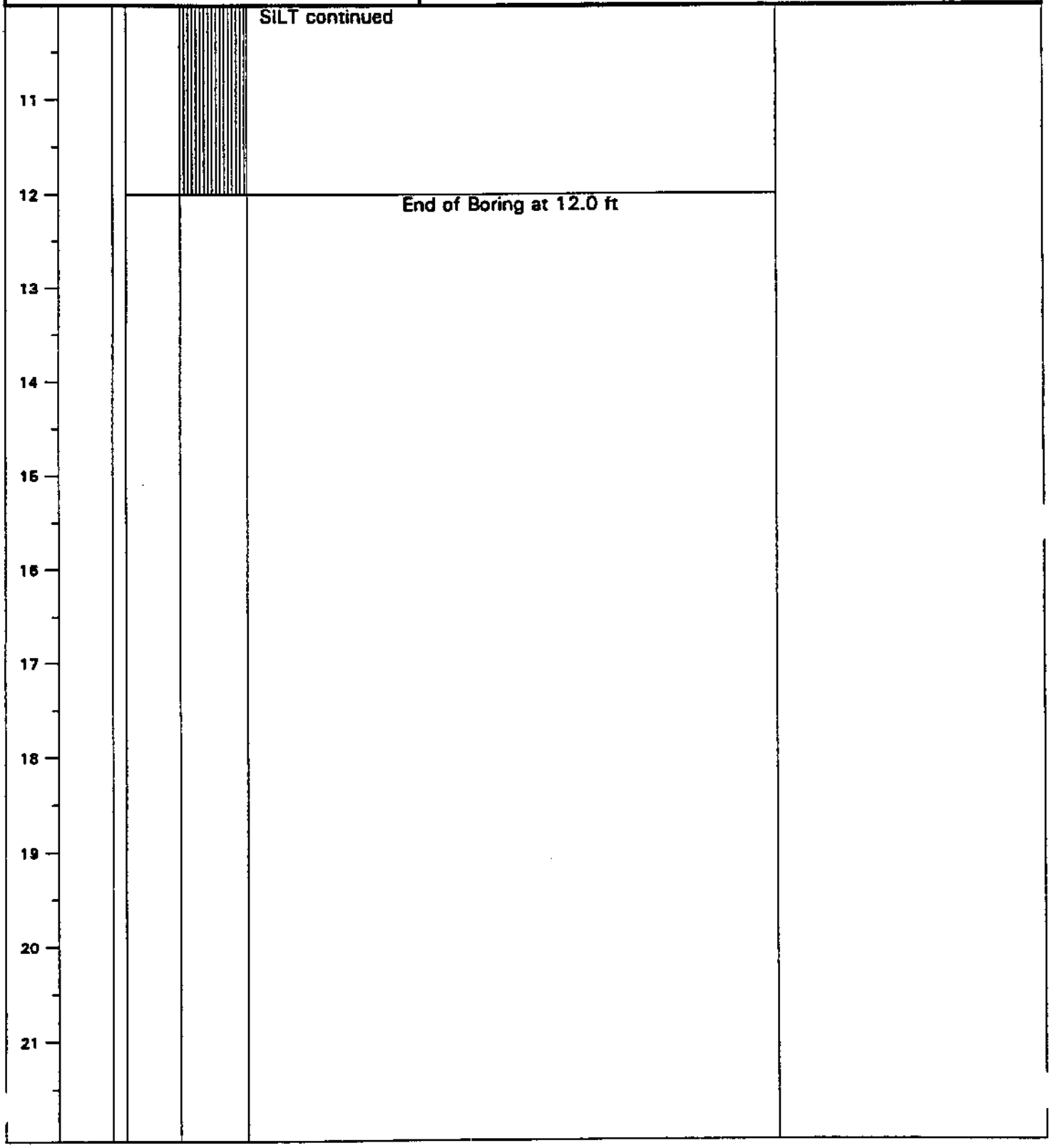
SURFACE CONDITIONS: **pickle weed/grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.0	ML		SILT, 10YR3/2, weak structure, very soft, poor gradation, wet, low plasticity, many pores and paths in between peat, majority fines, peat material; sample collected in 1' of water	intertidal marsh area sediment
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA

LOG OF SOIL BORING: **WHSSBC02**



MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/25/95	DATE 7/26/95

LOG OF SOIL BORING: **WHSSBD03**

Coordinates: **Wood Hogger Site**

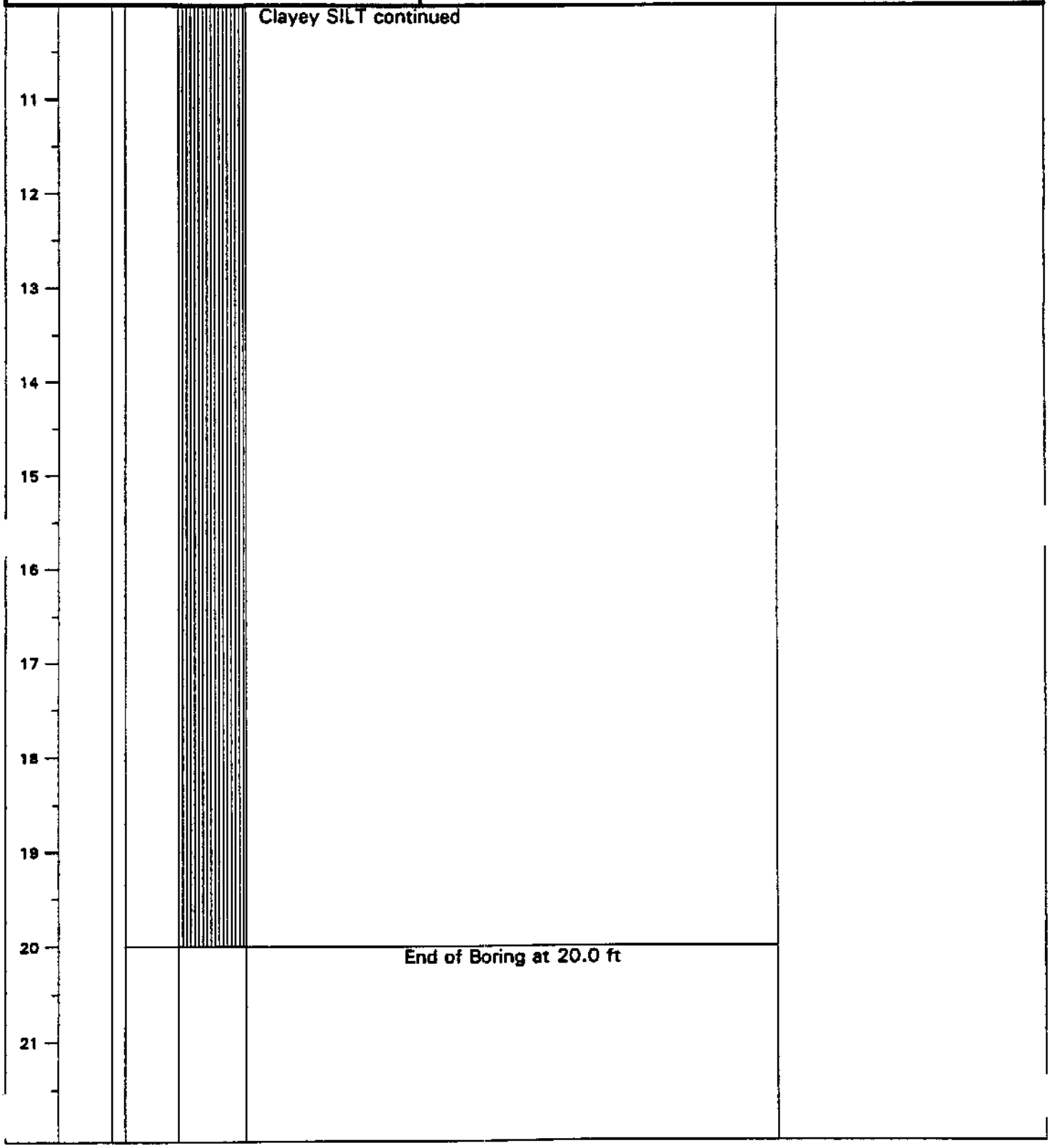
SURFACE CONDITIONS: **pickle weed/grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	2.3	ML		Clayey SILT with Sand, 10YR2/1, weak structure, very soft, poor gradation, wet, low plasticity, few pores and paths in between peat, majority fines, large wood pieces at surface, mild to strong sulfur odor	intertidal marsh/surface sediment
1		ML		Clayey SILT, 10YR2/1, weak structure, very soft, poor gradation, wet, low plasticity, few pores and paths in between peat, majority fines, very strong sulfur odor from 4'-15', mild odor from 0'-4'	intertidal marsh/surface sediment
2					
3					
4					
5					
6					
7					
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA

LOG OF SOIL BORING: **WHSSBD03**



MONTGOMERY WATSON

365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

DRILLING AND SAMPLING METHODS: Hand Geoprobe

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/18/95	DATE 7/18/95

LOG OF SOIL BORING: **WHSSBD07**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	167.0	SM		Silty SAND and GRAVEL, 10YR3/2, weak structure, very loose, poor gradation, dry, nonplastic, many pores and paths, pore spaces between sediment and grass, 20% fines, fine grained wood chips	wood chips and sediment from former wood hogger
1					
2		FILL		Large Pieces of WOOD Chips, 10YR2.5/1, weak structure, very loose, poor gradation, damp, nonplastic, many pores and paths, pore spaces between wood chips and gravels, 10% fines, fine to pebble sized wood chips	wood chips and sediment from former former wood hogger
3		CL		Sandy CLAY with Gravel, Quartz, 5Y3/1, 7.5YR5/6, moderate structure, medium stiff, poor gradation, moist, medium plasticity, many pores and paths, pore spaces between gravels, majority fines, hydrocarbon odor	(road base) with underlying clay
4		SW/SC		Well Graded SAND with Silt and Gravel, 5Y5/3, weak structure, very loose, moderate gradation, wet, low plasticity, many pores and paths between gravels and sand, 20% Fines	(road base) with underlying clay
5		CL		Sandy CLAY with Gravel, 10YR5/4, 5Y4/1, moderate structure, stiff, poor gradation, moist, medium plasticity, few pores and paths in between large gravels, majority fines, hydrocarbon odor	(road base) with underlying clay
6					
7		GW/GM		Well Graded GRAVEL with Silt and Sand, 10YR5/4, weak structure, very loose, moderate gradation, wet, nonplastic, many pores and paths in between gravels, 20% fines	(road base)
8		CL		Sandy CLAY with Gravel, 10YR5/3, strong structure, stiff, poor gradation, moist to wet, medium to high plasticity, few pores and paths in between some gravels, majority fines, hydrocarbon odor	fill material to elevate area around Wood Hogger
9					
10				End of Boring at 10.0 ft	

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/25/95	DATE 8/25/95

LOG OF SOIL BORING: **WHSSBE08**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.4	ML		Clayey SILT, 10YR4/2, 10YR3/1, weak structure, soft, poor gradation, moist, low plasticity, many pores and paths in between loose sediment, wood, majority fines, fill material; wood chips, very soft sediment	fill material to build up foundation around old Wood Hogger
2		FILL		WOOD/CONCRETE, 10YR3/1, strong structure, very dense, moist, nonplastic, many pores and paths, through wood, 0% fines, fill material; wood; concrete	fill material as boards used to lay and flatten area prior to placing fill material on top
3		SC/SM		Silty Clayey SAND, 5Y4/1, weak structure, loose, well gradation, wet, low plasticity, many pores and paths in between sand, 20% fines, fill material	fill material to build up foundation around old Wood Hogger
9		ML		Clayey SILT, 10YR3/1, weak structure, medium stiff, poor gradation, wet, low to medium plasticity, few pores and paths in between peat, majority fines, peat material; H2S odor; becomes clayier with depth	former wetlands/intertidal sediment

MONTGOMERY WATSON
365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

LOG OF SOIL BORING: **WHSSBE08**

Clayey SILT continued

End of Boring at 11.0 ft

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/25/95	DATE 7/25/95

LOG OF SOIL BORING: **WHSSBF03**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **sand**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	1.5	CL		Sandy CLAY with Gravel, 2.5 Y4/3, weak structure, very soft, poor gradation, wet, medium plasticity, few pores/paths in between gravels and sand, majority fines, 20% coarse, wood & metals, sample located near rusting metal containers	intertidal marsh/surface sediment
1		CL		Sandy CLAY, 10YR4/4, 5Y4/2, strong structure, very hard, poor gradation, damp, low plasticity, no pores/paths, majority fines, 35% coarse	compacted clay marsh sediment
2	2.0			Not Recorded	
3					
4					
5		CL/CH		Fat, Silty CLAY, 10YR3/1,5Y2.5/1, moderate structure, stiff, poor gradation, wet, high plasticity, few pores/paths in between peat, majority	intertidal marsh/ emplace
6					
7					
8					
9					
10					

MONTGOMERY WATSON
365 Lennon Lane
Walnut Creek,
California 94598
(510) 975-3400

CLIENT	PROJECT NUMBER	LOCATION
CONCORD WPNSTA	CTO 281	TIDAL AREA

LOG OF SOIL BORING: **WHSSBF03**

	Fat. Silty CLAY continued	
11	End of Boring at 11.0 ft	
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		DRILLING AND SAMPLING METHODS Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/25/95	DATE 8/25/95

LOG OF SOIL BORING: **WHSSBG06**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **wood debris**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	1.0	ML		Compacted SILT with Gravel, 2.5Y4/3, weak structure, stiff, poor gradation, dry, low plasticity, many pores and paths in between loose sediment, majority fines, gravels, fill material, wood	fill material from former debris dumpage area
		CL			fill material from former debris dumpage area
		GP/SP			
1	9.3			Silty CLAY, 2.5Y4/2, moderate structure, stiff, poor gradation, damp, low plasticity, no pores and paths, majority fines, fill material; wood chips	fill material from former debris dumpage area
2		CL		GRAVELS and Coarse SAND, GLEY4/10Y weak structure, loose, poor gradation, wet, nonplastic, many pores and paths in between gravels, 15% Fines, fill material	fill material from former debris dumpage area
3				Sandy CLAY, 5Y4/1, 5Y3/1, moderate to strong structure, stiff, poor gradation, moist, medium plasticity few pores and paths in between sand, majority fines, fill material	
4					
5					
6					
7		ML		SILT, 10YR2/1, weak structure, soft, poor gradation, moist, low plasticity, many pores and paths in between peat, loose sediment, majority fines, peat material; strong H2S odor	former wetlands/intertidal sediment
8					
9					
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA
		LOG OF SOIL BORING: **WHSSBG06**		

SILT continued

End of Boring at 11.0 ft

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 8/24/95	DATE 8/24/95

LOG OF SOIL BORING: **WHSSBH07**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.8	CL		Sandy CLAY with Gravel, 10YR4/2, 10YR5/4, moderate structure, medium stiff, poor gradation, moist, medium plasticity, many pores & paths in between sand, gravels, saturated sediment, majority fines, gravels, wood pieces, fill material, gw at 1' bgs; sweet odor	fill material overlying former wood dumpage
1		WOOD		WOOD, weak structure, loose, poor gradation, wet, nonplastic, many pores and paths in between wood, 0% fines, wood chunks, wood	wood and wood chips
2		FILL		DEBRIS; wood, concrete, 10YR4/6, weak structure, dense, damp to wet, nonplastic, many pores and paths in between wood, through soaked wood, 0% fines, wood pieces, concrete over 1' in thickness, refusal at 1' due to large wood pieces and concrete	wood dumpage and concrete material; fill material
3		ML		SILT, 2.5Y3/1, weak structure, very soft, poor gradation, moist, low plasticity, few pores and paths in between rootlets, loose sediment, saturated, majority fines, some peat; strong organic odor	former intertidal/wetlanc sediment
4	1.3				
5					
6					
7					
8					
9					
10				End of Boring at 9.5 ft	

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/20/95	DATE 7/20/95

LOG OF SOIL BORING: **WHSSBK06**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.0	ML		Sandy SILT with Gravels, 10YR2/2, weak structure, very soft, poor gradation, damp, low plasticity, few pores and paths in and around large gravels, majority fines, wood chips/gravels	surface sediment with gravel base from FAA tower
1		CL		Sandy CLAY, 10YR4/2, moderate structure, soft, poor gradation, moist, medium plasticity, no pores and paths, majority fines	fill material to build up slightly higher elevation for tower
		CL		Silty CLAY, 10YR3/2, strong structure, soft, poor gradation, moist, high plasticity, no pores and paths, majority fines	fine clays to build up slightly higher elvation for tower
2		FILL		Decayed WOOD, 10YR3/1, weak structure, soft, wet, nonplastic, many pores and paths in between wood chunks, 10% Fines, Wood, Decayed Wood	stacked wood that decayed; soil placed on top of wood
3					
4		CL		Sandy CLAY, 10YR2/2, weak structure, very soft, poor gradation, wet, low plasticity, few pores and paths in between sand, majority fines, wood chips	fill material from FAA tower
5					
6		CL		Sandy CLAY, 5Y3/1, moderate structure, medium stiff, poor gradation, wet, medium plasticity, no pores and paths, majority fines, peat	surface sediment/marsh sediment
7					
8					
9					
10				End of Boring at 10.0 ft	

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		

				START	FINISH
Water Level					
Time				TIME	TIME
Date				DATE 7/21/95	DATE 7/21/95

LOG OF SOIL BORING: **WHSSBL03**

Coordinates: **Wood Hogger Site**

SURFACE CONDITIONS: **road base**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	1.9	SC		Clayey SAND with Gravels, 10YR5/4, strong structure, hard, poor gradation, dry, low plasticity, many pores and paths in between sand and gravels, 30% fines, gravel base to rail road tracks, wood, hillside leading to rail road tracks	road base fill material
2		CL		Sandy CLAY, 10YR5/6, moderate structure, stiff, poor gradation, moist to very moist, low plasticity, no pores and paths, majority fines	road base fill material
4		GW		Well Graded GRAVELS with Clayey Sand, Quartz, 10YR5/6, weak structure, dense, well gradation, wet, low plasticity, many pores and paths in between gravels, 15% fines	road base fill material
6		CL		Silty CLAY, 10YR3/1, moderate structure, stiff, poor gradation, moist, medium plasticity, few pores and paths in between peat roots, majority fines, methane odor; clay becomes stiffer with depth	intertidal marsh
10				End of Boring at 10.0 ft	

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT: CONCORD WPNSTA	PROJECT NUMBER: CTO 281	LOCATION: TIDAL AREA
		DRILLING AND SAMPLING METHODS: Hand Geoprobe		
		Water Level	START	FINISH
LOG OF SOIL BORING: **WHSSBM08**		Time	TIME	TIME
Coordinates: **Wood Hogger Site**		Date	DATE 7/28/95	DATE 7/28/95

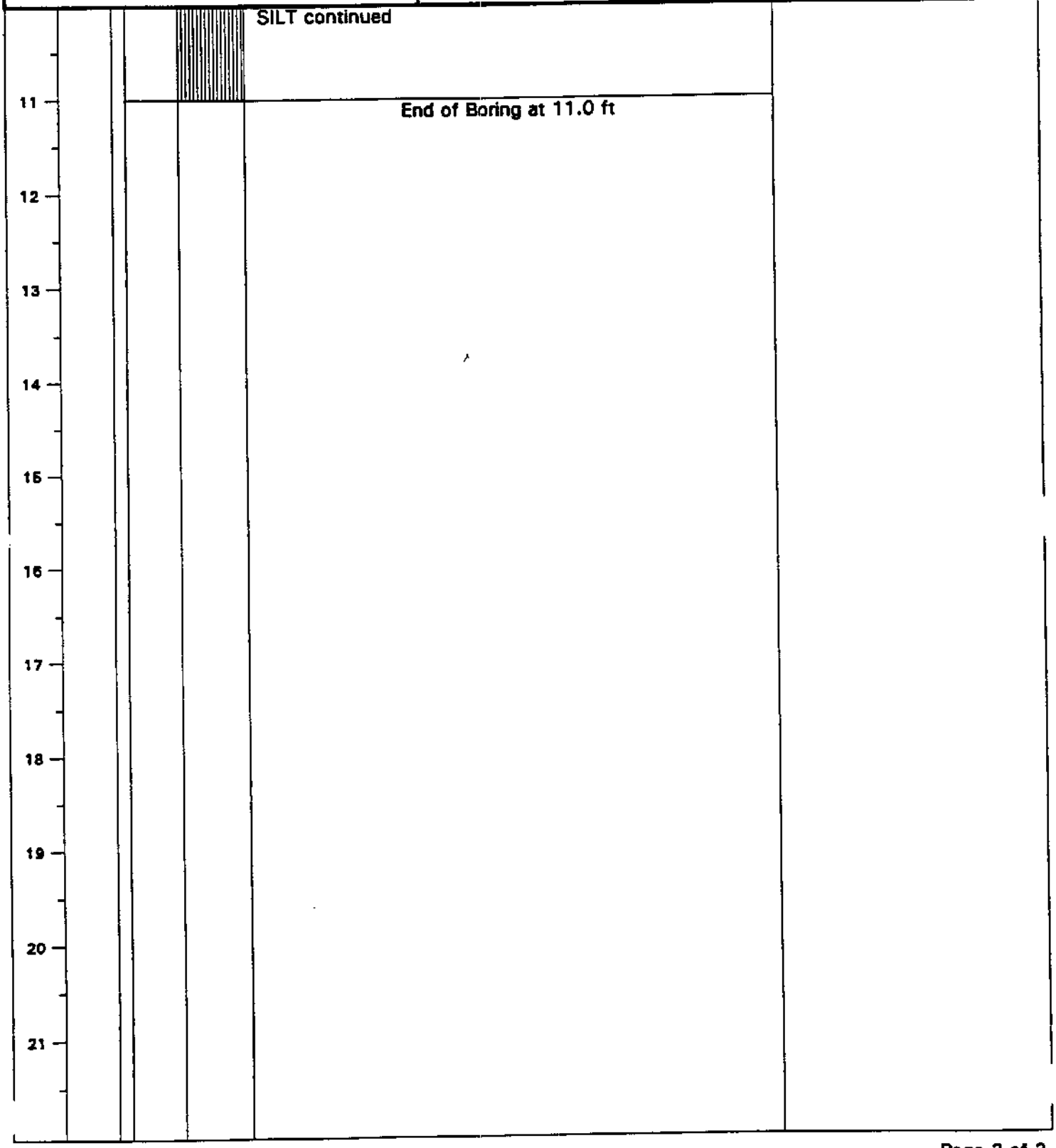
SURFACE CONDITIONS: **sparse grasses**

GEOLOGIST: **Y.LEUNG**

DEPTH (ft)	PID (ppm)	USCS	GRAPHIC LOG		FEATURES/REMARKS
0	0.4	CL		Sandy CLAY with Gravel, 5Y3/2, weak to moderate structure, medium stiff, poor gradation, wet, low plasticity, many pores and paths in between sand, gravels, majority fines, expended bullet casings, gravel road base, oil & reosote from overlying RR structure	intertidal marsh overlying former road base/layered fill w/intertidal surface sediment
2		GC		GRAVEL with Sandy Clay, 5Y5/3, weak structure, medium stiff, poor gradation, wet, low plasticity, many pores and paths in between gravels, 30% fines, gravel road base	road base fillmaterial underlying former road structure
3		CH		Fat Silty CLAY, 10YR4/2, GLEY3/10Y, strong structure, hard, poor gradation, damp, high plasticity, no pores and paths, majority fines, very compacted clays	possible compacted fill material underlying the road base gravels
4		CL		Silty CLAY with Sand, 5Y4/2, moderate structure, stiff, poor gradation, damp, medium plasticity, no pores and paths, majority fines	possible fill from former road/intertidal marsh sediment
7				Contact unknown sample unattainable	
9	2.3	ML		SILT, 10YR2/1, weak structure, soft, poor gradation, moist, low plasticity, many pores and paths in between peat and roots, majority fines, very strong sulfur odor	intertidal marsh sediment
10					

MONTGOMERY WATSON	365 Lennon Lane Walnut Creek, California 94598 (510) 975-3400	CLIENT CONCORD WPNSTA	PROJECT NUMBER CTO 281	LOCATION TIDAL AREA

LOG OF SOIL BORING: **WHSSBM08**



SWMU 37

BORING LOGS

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-01

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 1.51 ft. MSL
DATE DRILLED: 11-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vermilman	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS005	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp to moist, with trace angular to subrounded gravel Concrete fragments in shoe Refusal @ 3 ft. T.D. of boring @ 3.0 feet	

10
20
30

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-02

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 3.16 ft. MSL
DATE DRILLED: 13-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS007	0.0	PUSH		GW	FILL (af)	
						SM	SILTY GRAVEL (GW), gray (2.5Y 5/1), subangular to subrounded, well graded, damp, loose	
							COLLUVIUM (Qco)	
							SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained, poorly graded, dense, damp	
		SS008	0.0	PUSH			Water level @ 1.0 ft. bgs	
							Saturated @ 4.5 ft.	
							Refusal @ 5 ft.	
							T.D. of boring @ 5.0 feet	
10								
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ???????.DWG ??/??/?? PLOT 1=1 RGD1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-03

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 2.44 ft. MSL
DATE DRILLED: 13-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS009	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), gray (5Y 5/1), subangular to subrounded, well graded, damp, loose to medium dense, with trace fine-grained sand Moist @ 2.5 ft. Water level @ 3.3 ft. bgs	
		SS010	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/8) and dark grayish brown (2.5Y 4/2), mottled, very fine-grained, poorly graded, damp, medium dense	
							T.D. of boring @ 7.0 feet	
10								
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-04

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 2.46 ft. MSL
DATE DRILLED: 13-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS011	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), gray (5Y 5/1), angular to subrounded, well graded, damp, medium dense, with little fine-grained sand	
						ML	FILL (af) SANDY SILT (ML), light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6), mottled, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff	
		SS012	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), very dark gray (2.5Y 3/1), angular to subrounded, well graded, moist, dense, with little fine-grained sand	
10						ML	FILL (af) GRAVELLY SILT (GW), yellowish brown (10YR 5/6), with dark gray (10YR 4/1) gravel, low plasticity, damp, stiff, with little sand Refusal @ 6 ft.	
							T.D. of boring @ 6.0 feet	
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-05

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 4.5 ft. MSL
DATE DRILLED: 17-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS021	0.0	PUSH		GW	ASPHALT (~1 in.)	
						ML	FILL (af) SANDY GRAVEL (GW), gray (2.5Y 5/1) gravels with yellowish brown (10YR 5/6) fine-grained sand, well graded, angular to subangular, damp, loose COLLUVIUM (Qco) SANDY SILT (ML), dark grayish brown (2.5Y 4/2) and olive gray (5Y 4/2), mottled, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff	
		SS022	0.0	PUSH				
10							T.D. of boring @ 7.0 feet	
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-06

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 5.92 ft. MSL
DATE DRILLED: 17-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS023	0.0	PUSH		SM	ASPHALT (~1 in.) over BASEROCK (~4 in.) COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained, poorly graded, damp, medium dense Color changes to olive brown (2.5Y 4/4)	
		SS024	0.0	PUSH		SP	COLLUVIUM (Qco) SAND (SP), olive brown (2.5Y 4/4), fine-grained, poorly graded, wet, medium dense, with trace silt	
10							T.D. of boring @ 7.0 feet	
20								
30								

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-07

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 2.2 ft. MSL
DATE DRILLED: 13-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS013	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), gray (5Y 5/1), angular to subrounded, well graded, damp, medium dense	
						ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff, with trace gravel	
		SS014	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), light brown (2.5Y 5/4) and olive brown (2.5Y 4/3), mottled, very fine-grained, poorly graded, wet, medium dense, with trace clay	
							T.D. of boring @ 7.0 feet	
10								
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-08

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 1.44 ft. MSL
DATE DRILLED: 11-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS001	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/8), low plasticity, fine-grained sand, poorly graded, damp, medium dense with trace gravel	
							Change to moist	
		SS002	0.0	PUSH			FILL (af) CLAYEY SILT (ML), yellow brown (10YR 5/8) with dark gray (N4) mottling, medium plasticity, moist, medium soft	
							ASPHALT Refusal @ 6 ft.	
							T.D. of boring @ 6.0 feet	
10								
20								
30								

rrrr(r)(rrr-rrr) rrrrrrrr.DWG rr/rr/rr PLOT 1=1 RG01

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-09

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 1.37 ft. MSL
DATE DRILLED: 11-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS003	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp, stiff with trace angular gravel	
		SS004	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), gray (7.5YR 5/1), angular to subangular, well graded, damp, dense Asphalt @ 5.4 ft., refusal @ 5.5 ft.	
							T.D. of boring @ 5.5 feet	
10								
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-10

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 0.77 ft. MSL
DATE DRILLED: 17-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS025	0.0	PUSH		ML	ASPHALT (~3 in.) over BASEROCK (~2 in.) FILL (af) SANDY SILT (ML), olive brown (2.5Y 4/3) and dark yellowish brown (10YR 4/4), mottled, low plasticity, very fine-grained sand, poorly graded, moist, medium stiff, with little subrounded gravel	
		SS026	0.0				Color change to very dark gray (5Y 3/1) @ 3.5 ft. Refusal @ 4 ft.	
10							T.D. of boring @ 4.0 feet	
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-11

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 3.93 ft. MSL
DATE DRILLED: 18-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS028	0.0	PUSH		GW	ASPHALT (~1 in.)	
						SP	FILL (af) SILTY GRAVEL (GW), very dark gray (5Y 3/1), subangular to subrounded, well graded, damp, loose	
						SM	FILL (af) SAND (SP), yellowish brown (10YR 5/6), very fine-grained, poorly graded, damp, medium dense	
		SS029	0.0	PUSH		SP	COLLUVIUM (Qco) SILTY SAND (SM), very dark grayish brown (2.5Y 3/2), very fine-grained, poorly graded, moist, dense Trace asphaltic gravel @ 2 ft.	
						ML	COLLUVIUM (Qco) SAND (SP), very dark grayish brown (2.5Y 3/2), medium-grained, poorly graded, saturated, medium dense	
10						CL	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6) and dark gray (10YR 4/1), mottled, low plasticity, very fine-grained sand, poorly graded, moist, stiff, with trace siltstone fragments	
							YOUNGER BAY MUD (Qyb) SILTY CLAY (CL), very dark gray (5Y 3/1), medium plasticity, wet, soft, with little decayed organic material	
							T.D. of boring @ 11.0 feet	
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 ROOI

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-12

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 1.88 ft. MSL
DATE DRILLED: 14-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
		SS016	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/8) and olive brown (2.5Y 4/3), mottled, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff, with trace gravel and wood pieces Color change to yellowish brown (10YR 5/8) @ 4 ft., moist, minus wood pieces	
		SS017	0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/8), medium plasticity, very fine-grained sand, poorly graded, moist, medium stiff, with trace clay Color grading to olive gray (5Y 4/2) and dark yellowish brown (10YR 4/4) @ 7.5 ft., mottled Wet @ 10 ft. Saturated @ 10.5 ft.	
10							COLLUVIUM (Qco) CLAYEY SILT (ML), olive gray (5Y 4/2) and yellowish brown (10YR 5/6), mottled, medium plasticity, moist, medium stiff, with trace fine-grained sand	
							T.D. of boring @ 13.0 feet	
20								
30								

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF GEOPROBE BORING
37-13

PROJECT: INLAND/TIDAL AREA SI	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 3.93 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	CHEMICAL CONCENTRATIONS * (mg/kg) ▲ Diesel ■ Gasoline
						GW	ASPHALT (~1 in.)	
						SP	FILL (af)	
						SM	SILTY GRAVEL (GW), very dark gray (5Y 3/1), subangular to subrounded, well graded, damp, loose	
							FILL (af)	
							SAND (SP), yellowish brown (10YR 5/6), very fine-grained, poorly graded, damp, medium dense	
						SP	COLLUVIUM (Qco)	
							SILTY SAND (SM), very dark grayish brown (2.5Y 3/2), very fine-grained, poorly graded, moist, dense	
						ML	COLLUVIUM (Qco)	
							SAND (SP), very dark grayish brown (2.5Y 3/2), medium-grained, poorly graded, moist, medium dense	
10							COLLUVIUM (Qco)	
						CL	SANDY SILT (ML), yellowish brown (10YR 5/6) and dark gray (10YR 4/1), mottled, low plasticity, very fine-grained sand, poorly graded, moist, stiff, with trace siltstone fragments	
							YOUNGER BAY MUD (Qyb)	
							SILTY CLAY (CL), very dark gray (5Y 3/1), medium plasticity, wet, soft, with little decayed organic material	
20							T.D. of boring @ 12.0 feet	
30								

* Field screening Analytical Results

SHEET: 1 of 1

APPENDIX H

TIDAL INFLUENCE SURVEY DATA

(12 Pages)

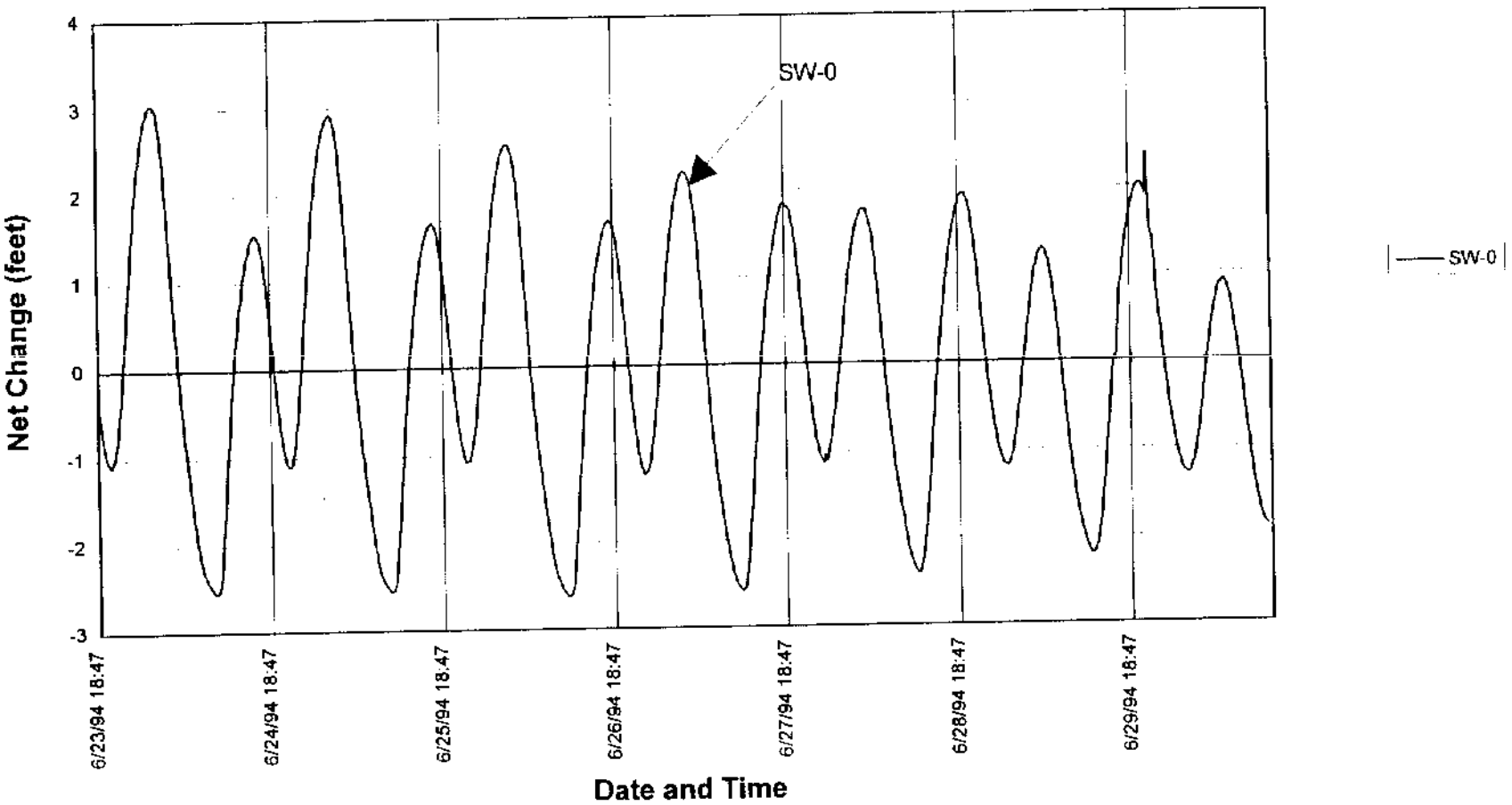
LOCATION OF WATER LEVEL MEASURING POINTS FOR THE TIDAL INFLUENCE SURVEY AT NWS CONCORD

Location	Surface Water Monitoring Site	Groundwater Monitoring Site
Suisun Bay	SW-0	NA
Otter Sluice	SW-1	NA
	SW-2	NA
	SW-5	NA
	SW-7	NA
	SW-8	NA
Tidal Area	NA	TLW-2
R Area Disposal	SW-3	RDW-2 RDW-3 RDW-4 RDW-5
Froid and Taylor Roads	SW-4	FTW-3
Wood Hogger	SW-6	NA
	NA	WHW-2
	NA	WHW-3

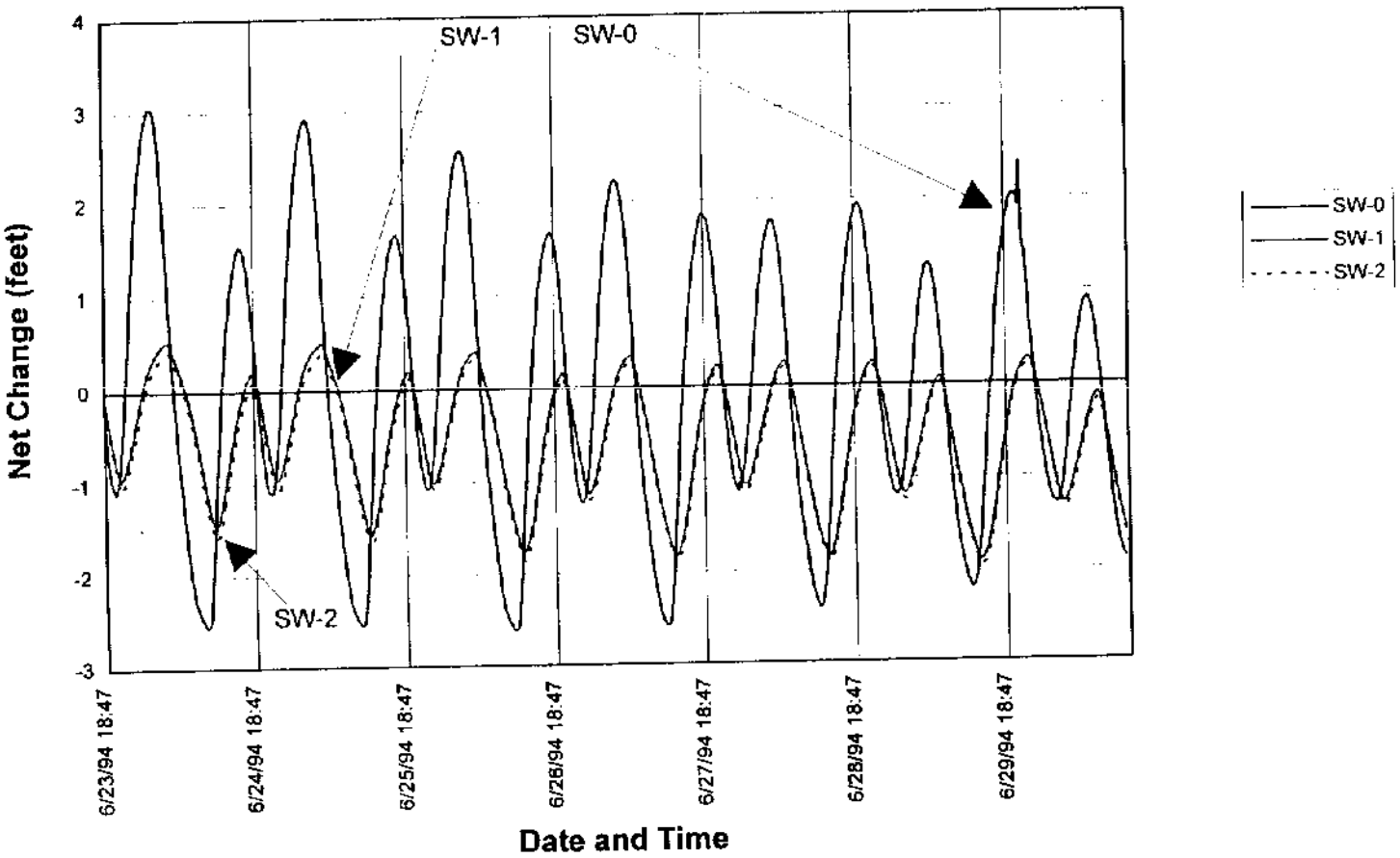
Notes:

NA Not applicable

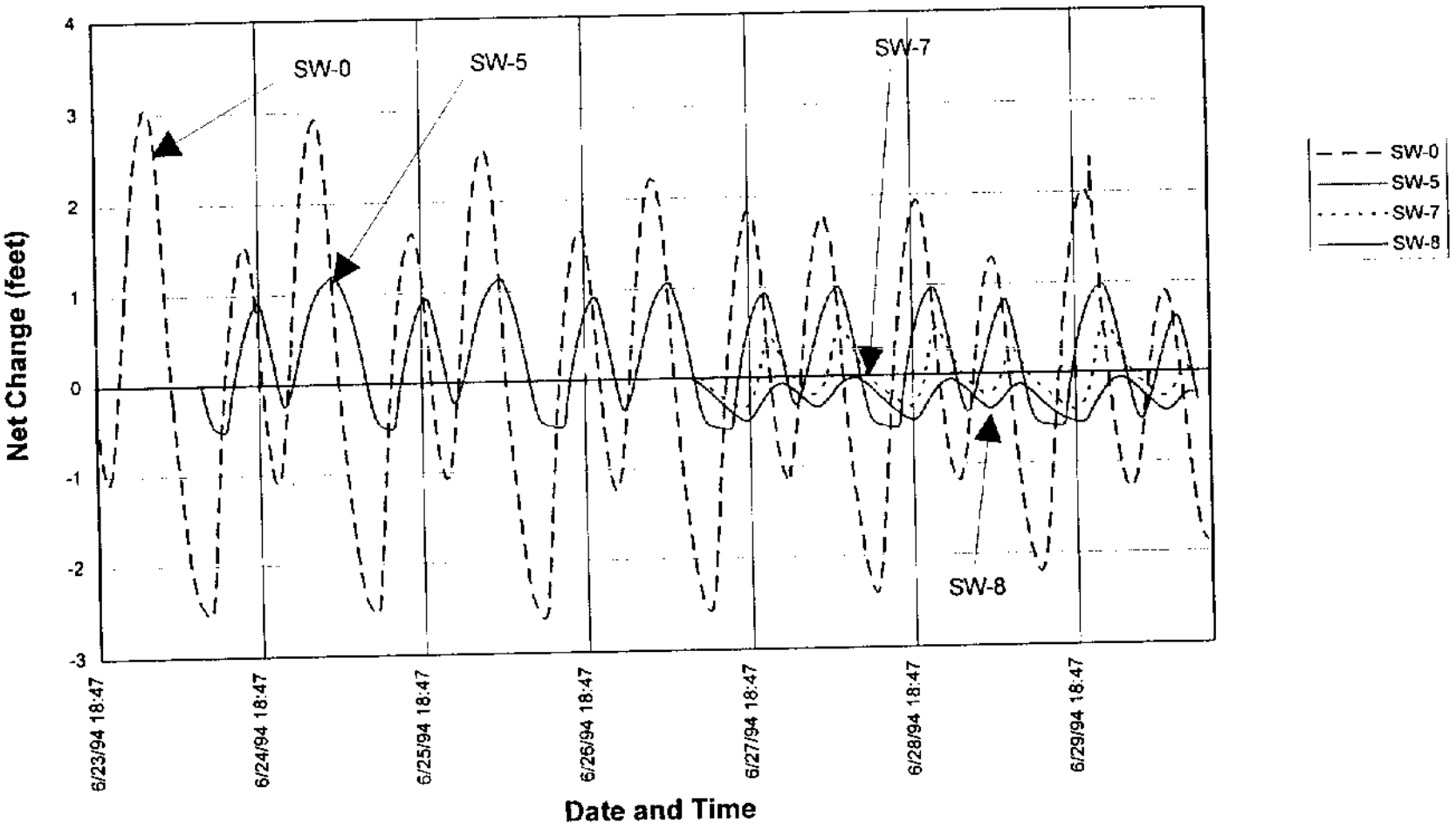
SW-0


SW-0
Net Change (feet)
4
3
2
1
0
-1
-2
-3
6/23/94 18:47
6/24/94 18:47
6/25/94 18:47
6/26/94 18:47
6/27/94 18:47
6/28/94 18:47
6/29/94 18:47
Date and Time
SW-0

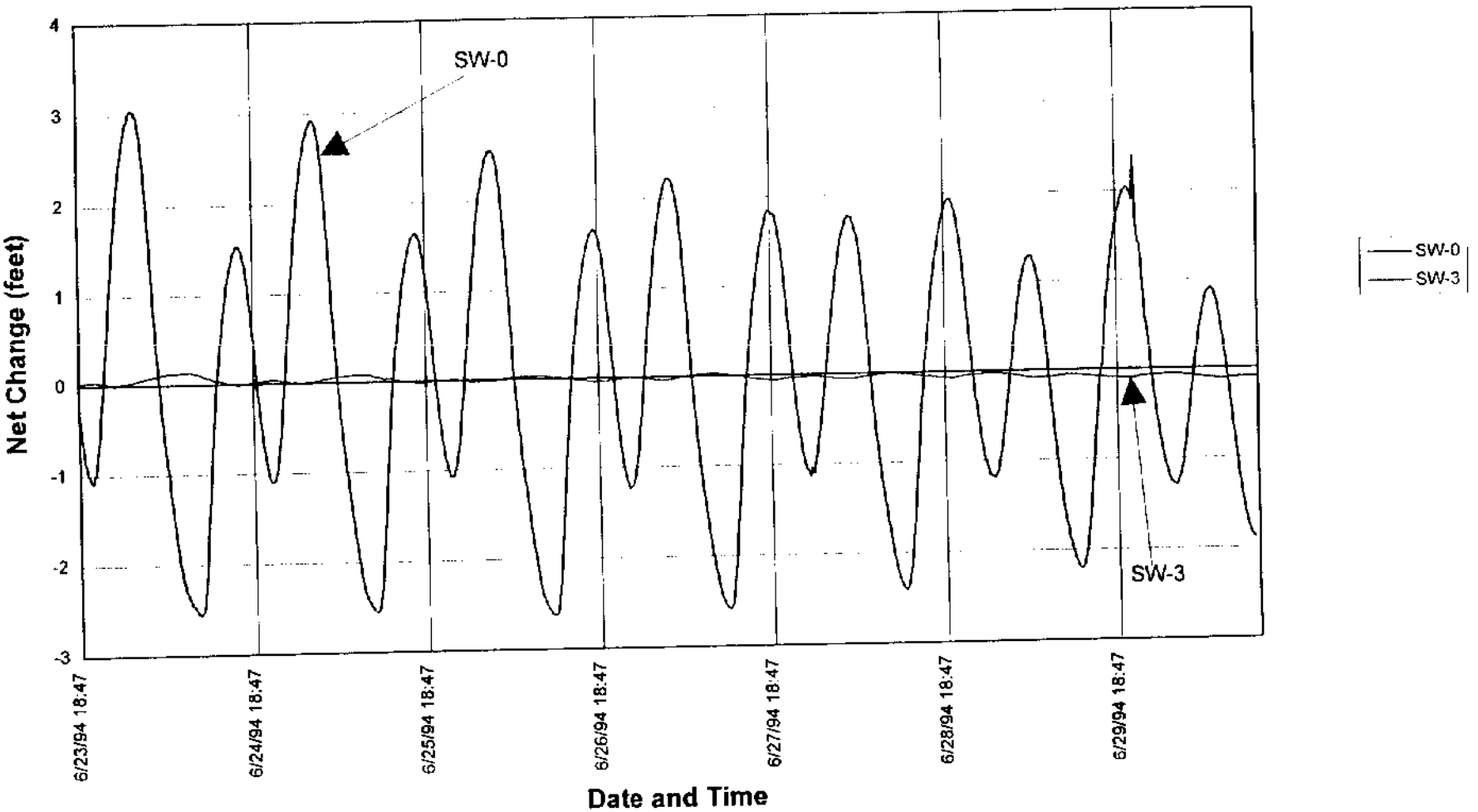
SW-0, SW-1, SW-2


SW-1
SW-0
SW-2
Net Change (feet)
4
3
2
1
0
-1
-2
-3
6/23/94 18:47
6/24/94 18:47
6/25/94 18:47
6/26/94 18:47
6/27/94 18:47
6/28/94 18:47
6/29/94 18:47
Date and Time
SW-0
SW-1
SW-2

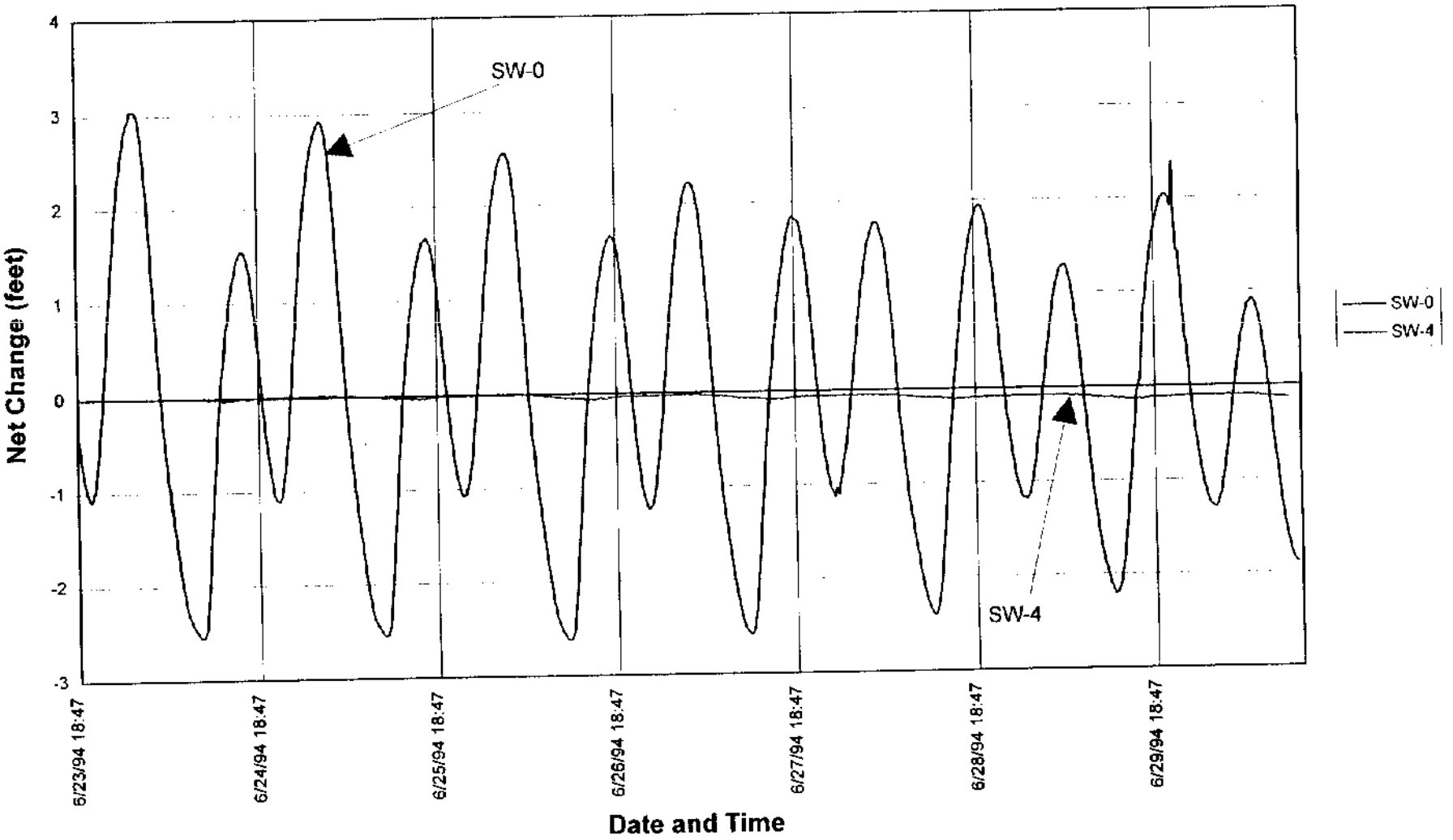
SW-0, SW-5, SW-7, SW-8



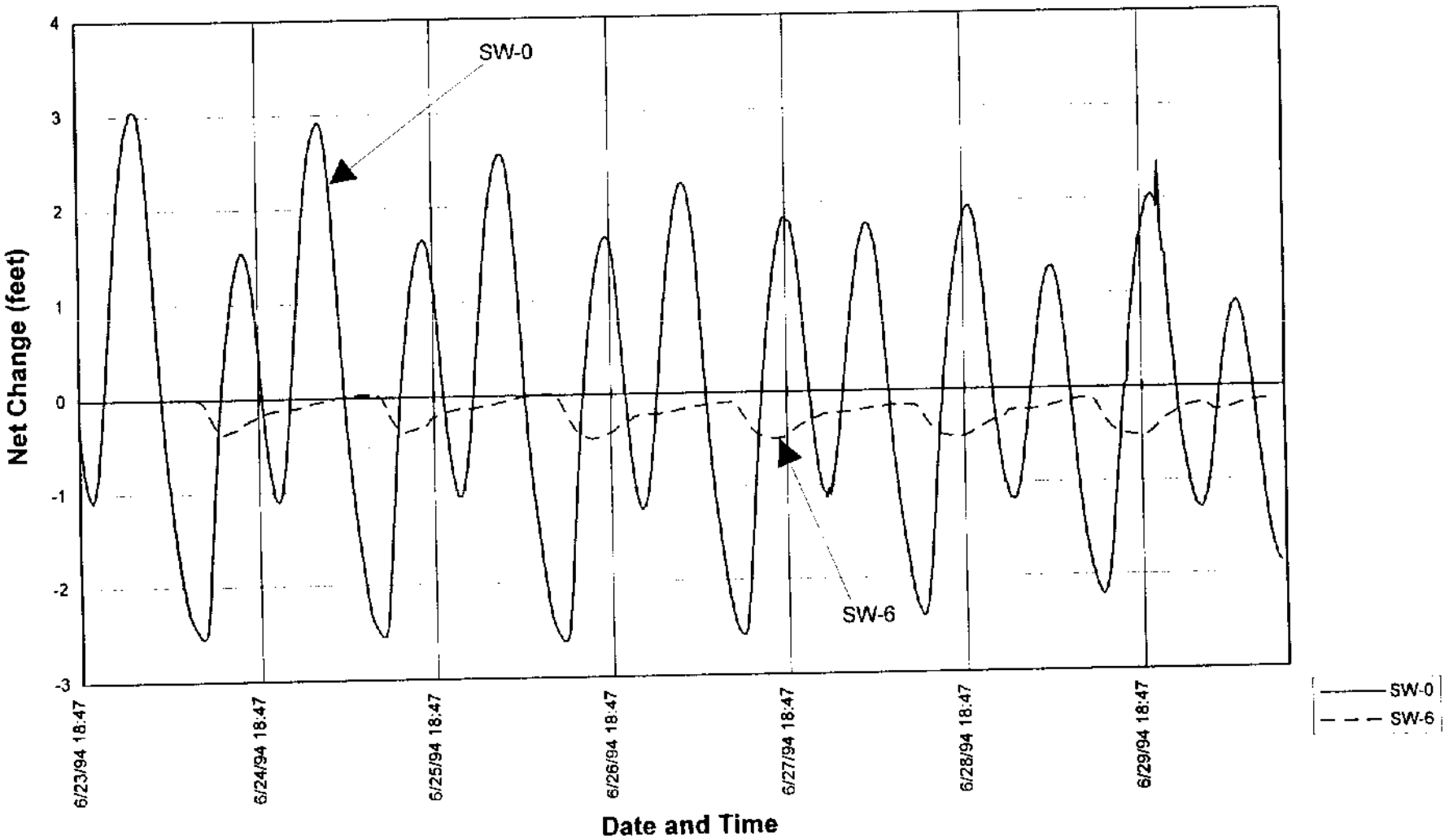
SW-0, SW-3


SW-0
SW-3
Net Change (feet)
4
3
2
1
0
-1
-2
-3
6/23/94 18:47
6/24/94 18:47
6/25/94 18:47
6/26/94 18:47
6/27/94 18:47
6/28/94 18:47
6/29/94 18:47
Date and Time
SW-0
SW-3

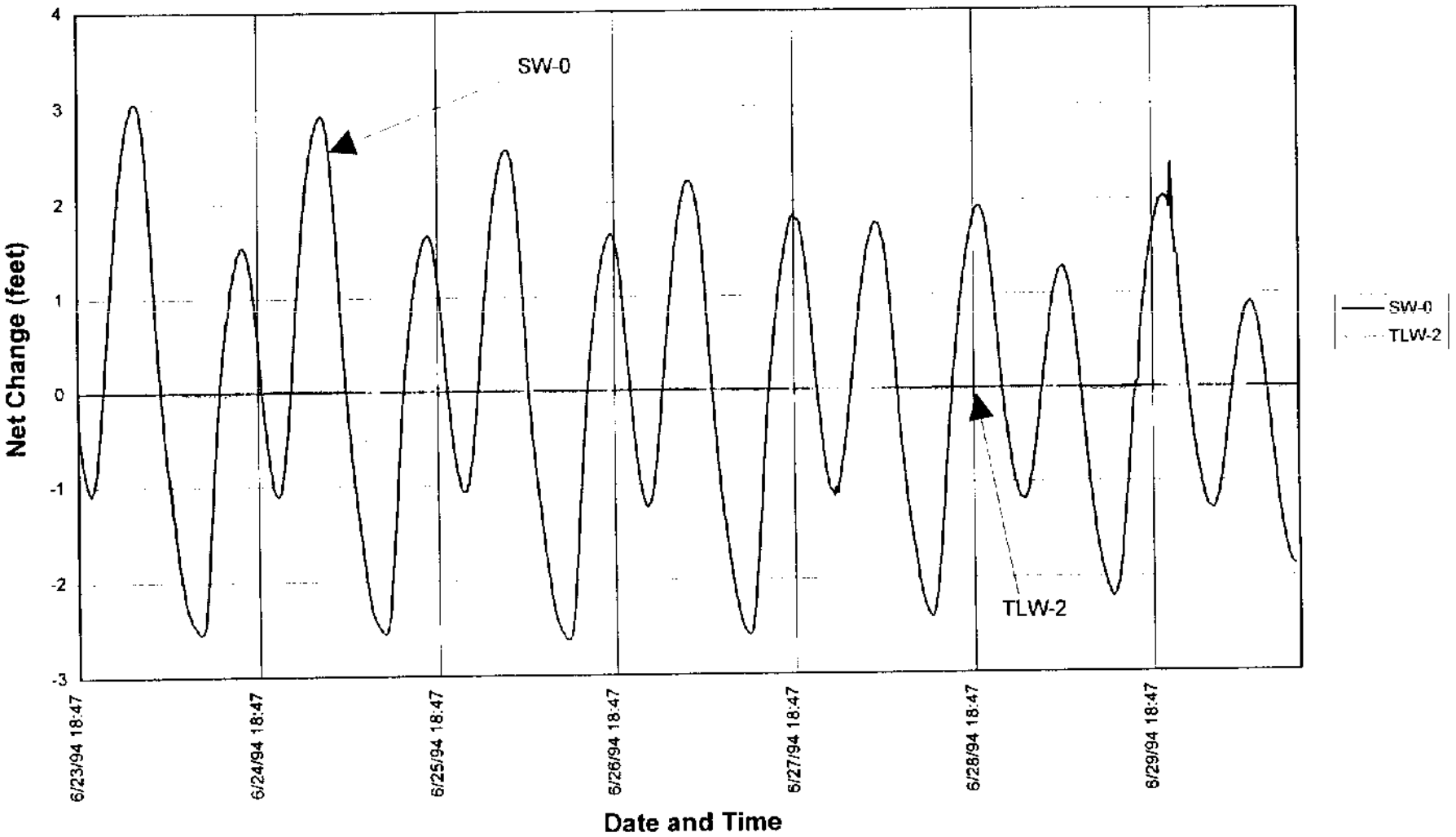
SW-0, SW-4


SW-0
SW-4
Net Change (feet)
4
3
2
1
0
-1
-2
-3
6/23/94 18:47
6/24/94 18:47
6/25/94 18:47
6/26/94 18:47
6/27/94 18:47
6/28/94 18:47
6/29/94 18:47
Date and Time
SW-0
SW-4

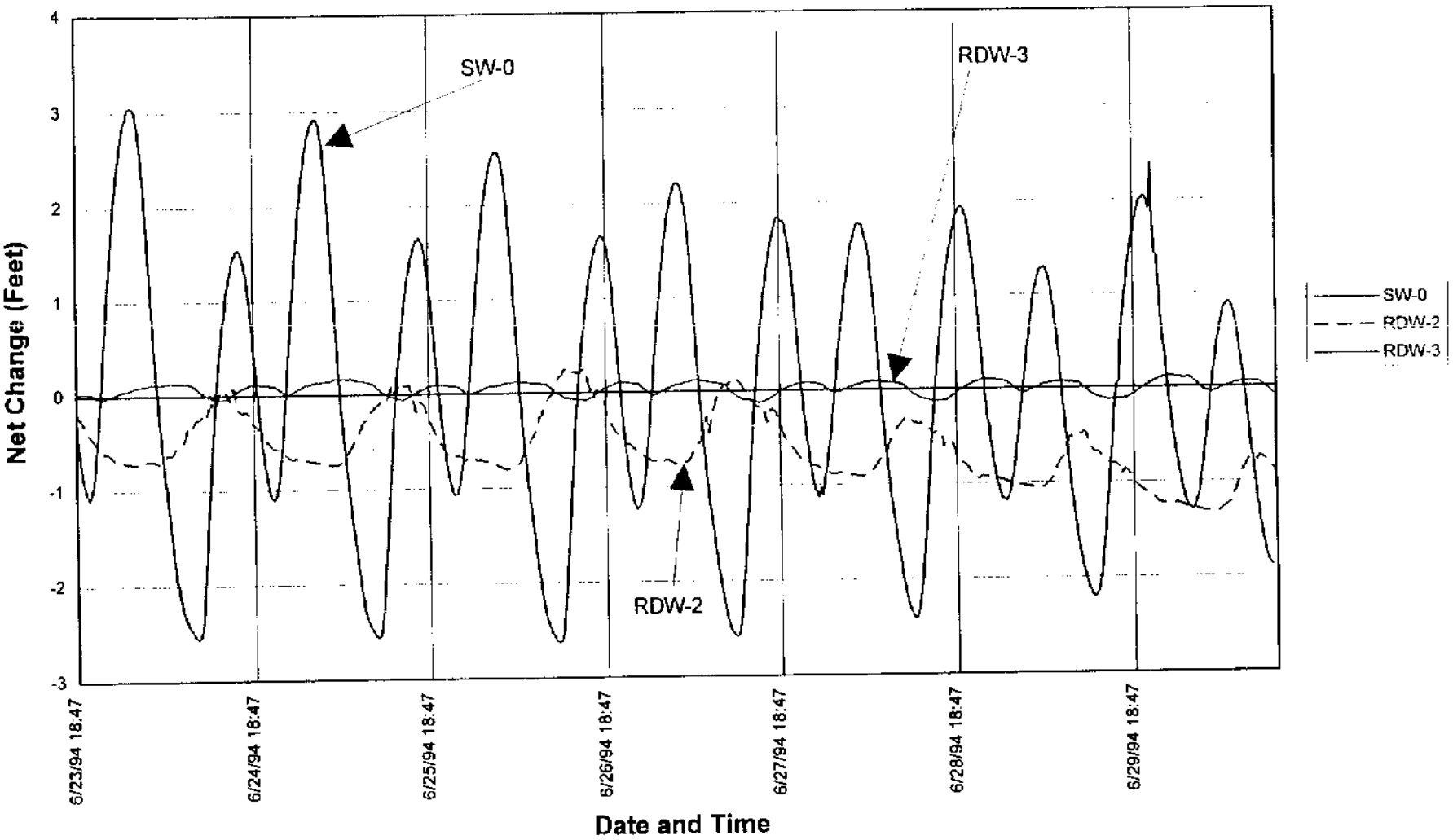
SW-0, SW-6


SW-0
SW-6
Net Change (feet)
4
3
2
1
0
-1
-2
-3
6/23/94 18:47
6/24/94 18:47
6/25/94 18:47
6/26/94 18:47
6/27/94 18:47
6/28/94 18:47
6/29/94 18:47
Date and Time
SW-0
SW-6

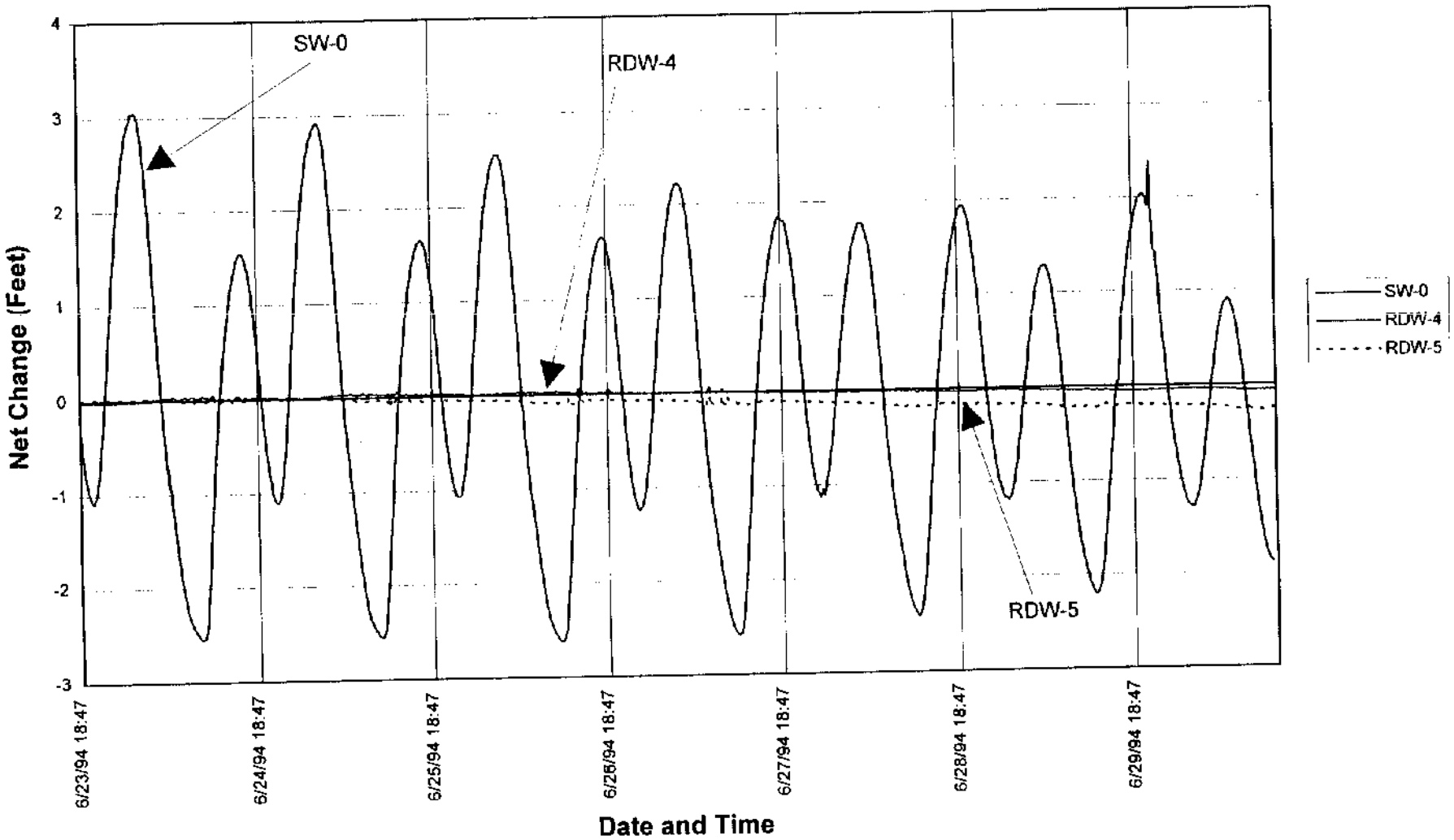
SW-0, TLW-2


SW-0
TLW-2
Net Change (feet)
4
3
2
1
0
-1
-2
-3
6/23/94 18:47
6/24/94 18:47
6/25/94 18:47
6/26/94 18:47
6/27/94 18:47
6/28/94 18:47
6/29/94 18:47
Date and Time
SW-0
TLW-2

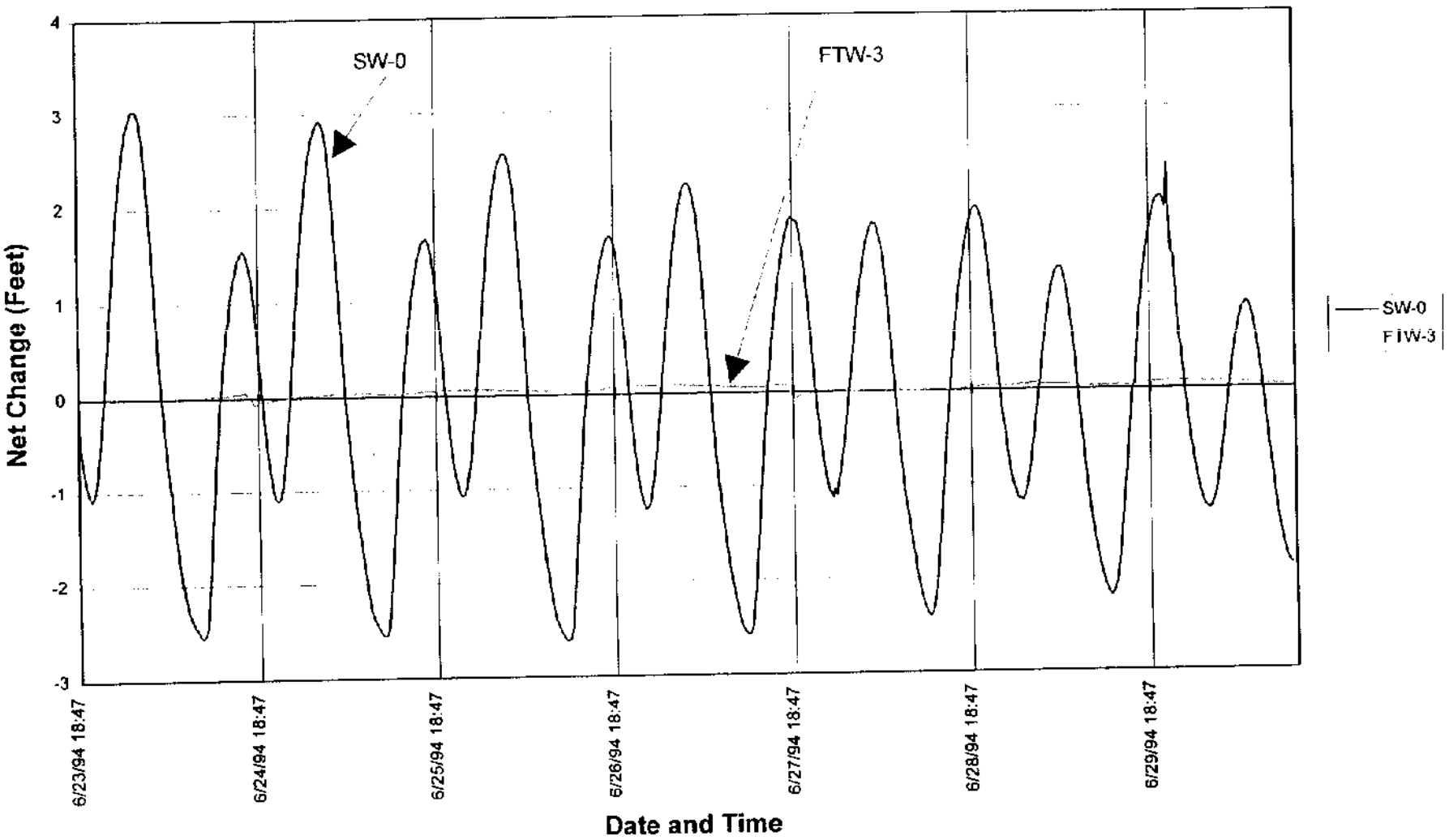
SW-0, RDW-2, RDW-3



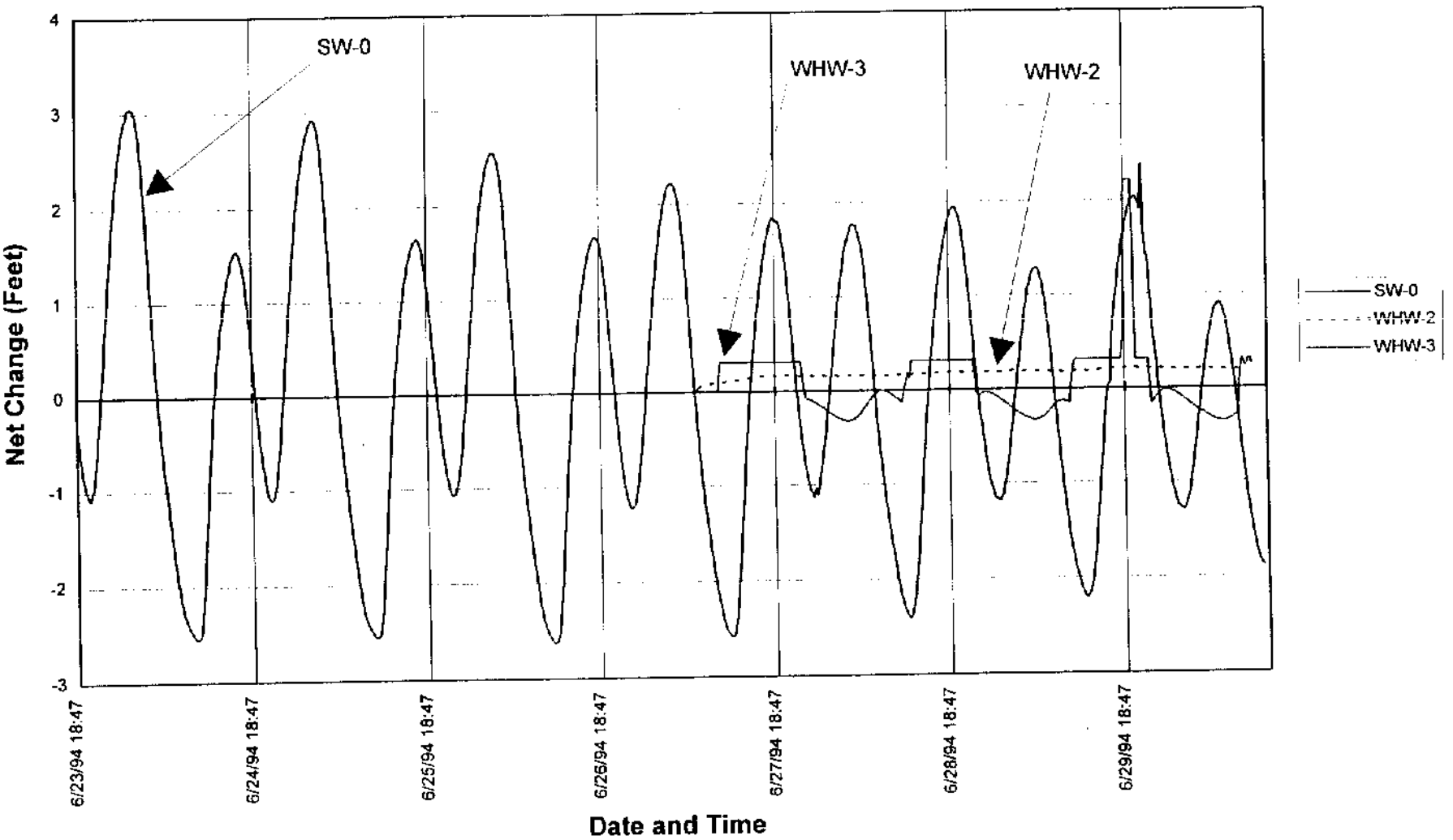
SW-0, RDW-4, RDW-5



SW-0, FTW-3


SW-0
FTW-3
Net Change (Feet)
4
3
2
1
0
-1
-2
-3
6/23/94 18:47
6/24/94 18:47
6/25/94 18:47
6/26/94 18:47
6/27/94 18:47
6/28/94 18:47
6/29/94 18:47
Date and Time
SW-0
FTW-3

SW-0, WHW-2, WHW-3



APPENDIX I

HUMAN HEALTH RISK ASSESSMENT TOXICITY PROFILES

Key: i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)								SOIL SCREENING LEVELS	
				V O C	skin abs. soils			Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDI (mg/kg-d)			CAS No.											
8.7E-03 i	4.0E-03 i	8.7E-03 r	4.0E-03 r	0	0.10	33660-19-1	Acephate	5.1E+01	ca**	3.4E+02	ca*	7.7E-01	ca*	7.7E+00	ca*		6.0E+01
7.7E-03 r	2.6E-03 r	7.7E-03 i	2.6E-03 i	1	0.10	75-07-0	Acetaldehyde	9.2E+00	ca**	2.2E+01	ca**	8.7E-01	ca*	1.5E+00	ca*		
	2.0E-02 i		2.0E-02 r	0	0.10	34256-82-1	Acetochlor	1.1E+03	nc	2.1E+04	nc	7.3E+01	nc	7.3E+02	nc		
	1.0E-01 i		1.0E-01 r	1	0.10	67-64-1	Acetone	1.4E+03	nc	6.1E+03	nc	3.7E+02	nc	6.1E+02	nc	1.6E+01	8.0E-01
	8.0E-04 h		2.9E-03 x	0	0.10	75-86-5	Acetone cyanohydrin	4.4E+01	nc	8.6E+02	nc	1.0E+01	nc	2.9E+01	nc		
	6.0E-03 i		1.4E-02 h	1	0.10	75-05-8	Acetonitrile	2.0E+02	nc	1.3E+03	nc	5.2E+01	nc	7.1E+01	nc		
	1.0E-01 i		5.7E-06 x	1	0.10	98-86-2	Acetophenone	4.9E-01	nc	1.6E+00	nc	2.1E-02	nc	4.2E-02	nc		
1.1E-01 o	1.3E-02 i	1.1E-01 r	1.3E-02 r	0	0.10	50594-66-6	Acifluorfen	4.0E+00	ca	2.7E+01	ca	6.1E-02	ca	6.1E-01	ca		
	2.0E-02 h		5.7E-06 i	1	0.10	107-02-8	Acrolein	1.0E-01	nc	3.4E-01	nc	2.1E-02	nc	4.2E-02	nc		
4.5E+00 i	2.0E-04 i	4.5E+00 i	2.0E-04 r	0	0.10	79-06-1	Acrylamide	9.8E-02	ca	6.6E-01	ca	1.5E-03	ca	1.5E-02	ca		
	5.0E-01 i		2.9E-04 i	0	0.10	79-10-7	Acrylic acid	2.6E+04	nc	4.2E+05	nc	1.0E+00	nc	1.8E+04	nc		
5.4E-01 i	1.0E-03 h	2.4E-01 i	5.7E-04 i	1	0.10	107-13-1	Acrylonitrile	1.9E-01	ca*	4.9E-01	ca*	2.8E-02	ca*	3.7E+00	ca*		
8.1E-02 h	1.0E-02 i	8.0E-02 r	1.0E-02 r	0	0.10	15972-60-8	Alachlor	5.5E+00	ca*	3.7E+01	ca	8.4E-02	ca	8.4E-01	ca		
	1.5E-01 i		1.5E-01 r	0	0.10	1596-84-5	Alar	8.2E+03	nc	1.6E+05	nc	5.5E+02	nc	5.5E+03	nc		
	1.0E-03 i		1.0E-03 r	0	0.10	116-06-3	Aldicarb	5.5E+01	nc	1.1E+03	nc	3.7E+00	nc	3.7E+01	nc		
	1.0E-03 i		1.0E-03 r	0	0.10	1646-88-4	Aldicarb sulfone	5.5E+01	nc	1.1E+03	nc	3.7E+00	nc	3.7E+01	nc		
1.7E+01 i	3.0E-05 i	1.7E+01 i	3.0E-05 r	0	0.10	309-00-2	Aldrin	2.6E-02	ca*	1.8E-01	ca	3.9E-04	ca	4.0E-03	ca	1.2E+04	5.9E+02
	2.5E-01 i		2.5E-01 r	0	0.10	5585-64-8	Ally	1.4E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
	5.0E-03 x		5.0E-03 r	0	0.10	107-18-6	Allyl alcohol	2.7E+02	nc	5.3E+03	nc	1.8E+01	nc	1.8E+02	nc		
	5.0E-02 h		2.9E-04 i	0	0.10	107-05-1	Allyl chloride	2.7E+03	nc	5.2E+04	nc	1.0E+00	nc	1.8E+03	nc		
	1.0E+00 n			0	0.01	7429-90-5	Aluminum	7.5E+04	nc	1.0E+05	max			3.7E+04	nc		
	4.0E-04 i			0	0.01	20859-73-8	Aluminum phosphide	3.0E+01	nc	7.5E+02	nc			1.5E+01	nc		
	3.0E-04 i		3.0E-04 r	0	0.10	67485-29-4	Amdro	1.6E+01	nc	3.2E+02	nc	1.1E+00	nc	1.1E+01	nc		
	9.0E-03 i		9.0E-03 r	0	0.10	834-12-8	Ametryn	4.9E+02	nc	9.6E+03	nc	3.3E+01	nc	3.3E+02	nc		
	7.0E-02 h		7.0E-02 r	0	0.10	591-27-5	m-Aminophenol	3.8E+03	nc	7.5E+04	nc	2.6E+02	nc	2.6E+03	nc		
	2.0E-05 h		2.0E-05 r	0	0.10	504-24-5	4-Aminopyridine	1.1E+00	nc	2.1E+01	nc	7.3E-02	nc	7.3E-01	nc		
	2.5E-03 i		2.5E-03 r	0	0.10	33089-61-1	Amitraz	1.4E+02	nc	2.7E+03	nc	9.1E+00	nc	9.1E+01	nc		
			2.9E-02 i	n/a	n/a	7664-41-7	Ammonia					1.0E+02	nc				
	2.0E-01 i			0	0.10	7773-06-0	Ammonium sulfamate	1.1E+04	nc	1.0E+05	max			7.3E+03	nc		
5.7E-03 i	7.0E-03 n	5.7E-03 r	2.9E-04 i	0	0.10	62-53-3	Aniline	7.8E+01	ca**	5.3E+02	ca*	1.0E+00	nc	1.2E+01	ca*		
	4.0E-04 i			0	0.01	7440-36-0	Antimony and compounds	3.0E+01	nc	7.5E+02	nc			1.5E+01	nc	5.0E+00	3.0E-01
	5.0E-04 h			0	0.01	1314-60-9	Antimony pentoxide	3.7E+01	nc	9.4E+02	nc			1.8E+01	nc		
	9.0E-04 h			0	0.01	28300-74-5	Antimony potassium tartrate	6.7E+01	nc	1.7E+03	nc			3.3E+01	nc		
	4.0E-04 h			0	0.01	1332-81-6	Antimony tetroxide	3.0E+01	nc	7.5E+02	nc			1.5E+01	nc		
	4.0E-04 h			0	0.01	1309-64-4	Antimony trioxide	3.0E+01	nc	7.5E+02	nc			1.5E+01	nc		
	1.3E-02 i		1.3E-02 r	0	0.10	74115-24-5	Apollo	7.1E+02	nc	1.4E+04	nc	4.7E+01	nc	4.7E+02	nc		
2.5E-02 i	5.0E-02 h	2.5E-02 i	5.0E-02 r	0	0.10	140-57-8	Aramite	1.8E+01	ca	1.2E+02	ca	2.7E-01	ca	2.7E+00	ca		
	3.0E-04 i			0	0.03	7440-38-2	Arsenic (noncancer endpoint)	2.1E+01	nc	4.8E+02	nc						
1.5E+00 i	3.0E-04 i	1.5E+01 i		0	0.03	7440-38-2	Arsenic (cancer endpoint)	3.8E-01	ca*	3.0E+00	ca	4.5E-04	ca	4.5E-02	ca	2.9E+01	1.0E+00
			1.4E-05 i	n/a	n/a	7784-42-1	Arsine (see arsenic for cancer endpoint)					5.2E-02	nc				
	9.0E-03 i		9.0E-03 r	0	0.10	76578-12-6	Assure	4.9E+02	nc	9.6E+03	nc	3.3E+01	nc	3.3E+02	nc		
	5.0E-02 i		5.0E-02 r	0	0.10	3337-71-1	Asulam	2.7E+03	nc	5.3E+04	nc	1.8E+02	nc	1.8E+03	nc		
2.2E-01 h	3.5E-02 h	2.2E-01 r	3.5E-02 h	0	0.10	1912-24-9	Atrazine	2.0E+00	ca	1.3E+01	ca	3.1E-02	ca	3.0E-01	ca		
	4.0E-04 i		4.0E-04 r	0	0.10	71751-41-2	Avermectin B1	2.2E+01	nc	4.3E+02	nc	1.5E+00	nc	1.5E+01	nc		
1.1E-01 i		1.1E-01 i		0	0.10	103-33-3	Azobenzene	4.0E+00	ca	2.7E+01	ca	6.2E-02	ca	6.1E-01	ca		

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
				V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFI 1/(mg/kg-d)	RfDI (mg/kg-d)										
	7.0E-02 i		1.4E-04 h	0	0.01	7440-39-3	**Barium and compounds**	5.2E+03 nc	1.0E+05 max	5.2E-01 nc	2.6E+03 nc	1.6E+03	8.2E+01
	4.0E-03 x		4.0E-03 r	0	0.10	114-26-1	Baygon	2.2E+02 nc	4.3E+03 nc	1.5E+01 nc	1.5E+02 nc		
	3.0E-02 i		3.0E-02 r	0	0.10	43121-43-3	Bayleton	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
	2.5E-02 i		2.5E-02 r	0	0.10	68359-37-5	Baythroid	1.4E+03 nc	2.7E+04 nc	9.1E+01 nc	9.1E+02 nc		
	3.0E-01 i		3.0E-01 r	0	0.10	1861-40-1	Benefin	1.6E+04 nc	1.0E+05 max	1.1E+03 nc	1.1E+04 nc		
	5.0E-02 i		5.0E-02 r	0	0.10	17804-35-2	Benomyl	2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		
	3.0E-02 i		3.0E-02 r	0	0.10	25057-89-0	**Bentazon**	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
	1.0E-01 i		1.0E-01 r	0	0.10	100-52-7	Benzaldehyde	5.5E+03 nc	1.1E+05 nc	3.7E+02 nc	3.7E+03 nc		
2.9E-02 i	3.0E-03 n	2.9E-02 i	1.7E-03 n	1	0.10	71-43-2	**Benzene**	6.2E-01 ca*	1.4E+00 ca*	2.3E-01 ca*	3.9E-01 ca*	3.0E-02	2.0E-03
2.3E+02 i	3.0E-03 i	2.3E+02 i	3.0E-03 r	0	0.10	92-87-5	Benzidine	1.9E-03 ca	1.3E-02 ca	2.9E-05 ca	2.9E-04 ca		
	4.0E+00 i		4.0E+00 i	0	0.10	65-85-0	Benzoic acid	1.0E+05 max	1.0E+05 max	1.5E+04 nc	1.5E+05 nc	4.0E+02	2.0E+01
1.3E+01 i		1.3E+01 r		0	0.10	98-07-7	Benzotrichloride	3.4E-02 ca	2.3E-01 ca	5.2E-04 ca	5.2E-03 ca		
	3.0E-01 h		3.0E-01 r	0	0.10	100-51-6	Benzyl alcohol	1.6E+04 nc	1.0E+05 max	1.1E+03 nc	1.1E+04 nc		
1.7E-01 i		1.7E-01 r		1	0.10	100-44-7	Benzyl chloride	8.1E-01 ca	2.2E+00 ca	4.0E-02 ca	6.6E-02 ca		
	2.0E-03 i	8.4E+00 i	5.7E-05 i	0	0.01	7440-41-7	**Beryllium and compounds**	1.5E+02 nc	3.4E+03 nc	8.0E-04 ca*	7.3E+01 nc	6.3E+01	3.0E+00
	1.0E-04 i		1.0E-04 r	0	0.10	141-66-2	Bidrin	5.5E+00 nc	1.0E+00 nc	3.7E-01 nc	3.7E+00 nc		
	1.5E-02 i		1.5E-02 r	0	0.10	82657-04-3	Biphenthrin (Talstar)	8.2E+02 nc	1.6E+04 nc	5.5E+01 nc	5.5E+02 nc		
	5.0E-02 i		5.0E-02 r	1	0.10	92-52-4	**1,1-Biphenyl**	2.3E+03 nc	2.4E+04 nc	1.8E+02 nc	3.0E+02 nc		
1.1E+00 i		1.2E+00 i		1	0.10	111-44-4	Bis(2-chloroethyl)ether	1.8E-01 ca	5.6E-01 ca	5.8E-03 ca	9.8E-03 ca	4.0E-04	2.0E-05
7.0E-02 h	4.0E-02 i	3.5E-02 h	4.0E-02 r	1	0.10	39638-32-9	Bis(2-chloroisopropyl)ether	2.5E+00 ca	7.4E+00 ca	1.9E-01 ca	2.7E-01 ca		
2.2E+02 i		2.2E+02 i		1	0.10	542-88-1	Bis(chloromethyl)ether	1.9E-04 ca	4.3E-04 ca	3.1E-05 ca	5.2E-05 ca		
7.0E-02 h		3.5E-02 h		0	0.10	108-60-1	Bis(2-chloro-1-methylethyl)ether	6.3E+00 ca	4.3E+01 ca	1.9E-01 ca	9.6E-01 ca		
1.4E-02 i	2.0E-02 i	1.4E-02 r	2.2E-02 r	0	0.10	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	3.2E+01 ca*	2.1E+02 ca	4.8E-01 ca	4.8E+00 ca		
	5.0E-02 i		5.0E-02 r	0	0.10	80-05-7	Bisphenol A	2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		
	9.0E-02 i		5.7E-03 h	0	0.10	7440-42-8	Boron	4.9E+03 nc	9.6E+04 nc	2.1E+01 nc	3.3E+03 nc		
			2.0E-04 h	0	0.10	7637-07-2	Boron trifluoride			7.3E-01 nc			
	2.0E-02 n		2.9E-03 n	1	0.10	S 108-86-1	**Bromobenzene**	2.8E+01 nc	9.2E+01 nc	1.0E+01 nc	2.0E+01 nc		
6.2E-02 i	2.0E-02 i	6.2E-02 r	2.0E-02 r	1	0.10	75-27-4	Bromodichloromethane	9.8E-01 ca	2.3E+00 ca	1.1E-01 ca	1.8E-01 ca	5.0E-01	3.0E-02
7.9E-03 i	2.0E-02 i	3.9E-03 i	2.0E-02 r	0	0.10	75-25-2	Bromoform (tribromomethane)	5.6E+01 ca*	3.8E+02 ca*	1.7E+00 ca*	8.5E+00 ca*	8.0E-01	4.0E-02
	1.4E-03 i		1.4E-03 i	1	0.10	74-83-9	Bromomethane (Methyl bromide)	3.8E+00 nc	1.3E+01 nc	5.2E+00 nc	8.7E+00 nc	2.0E-01	1.0E-02
				0	0.10	101-55-3	4-Bromophenyl phenyl ether						
	5.0E-03 h		5.0E-03 r	0	0.10	2104-96-3	Bromophos	2.7E+02 nc	5.3E+03 nc	1.8E+01 nc	1.8E+02 nc		
	2.0E-02 i		2.0E-02 r	0	0.10	1689-84-5	Bromoxynil	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	1.8E+02 nc		
	2.0E-02 i		2.0E-02 r	0	0.10	1689-99-2	Bromoxynil octanoate	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		
9.8E-01 r		9.8E-01 i		1	0.10	106-99-0	1,3-Butadiene	6.5E-03 ca	1.4E-02 ca	6.9E-03 ca	1.1E-02 ca		
	1.0E-01 i		1.0E-01 r	0	0.10	71-36-3	1-Butanol	5.5E+03 nc	1.1E+05 nc	3.7E+02 nc	3.7E+03 nc	1.7E+01	9.0E-01
	5.0E-02 i		5.0E-02 r	0	0.10	2008-41-5	Butylate	2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		
	1.0E-02 n		1.0E-02 r	1	0.10	104-51-8	***n*-Butylbenzene**	1.3E+02 nc	5.5E+02 nc	3.7E+01 nc	6.1E+01 nc		
	1.0E-02 n		1.0E-02 r	1	0.10	135-9-88	**sec-Butylbenzene**	1.0E+02 nc	4.1E+02 nc	3.7E+01 nc	6.1E+01 nc		
	1.0E-02 n		1.0E-02 r	1	0.10	104-5-18	**tert-Butylbenzene**	1.2E+02 nc	4.9E+02 nc	3.7E+01 nc	6.1E+01 nc		
	2.0E-01 i		2.0E-01 r	0	0.10	85-68-7	Butyl benzyl phthalate	9.3E+02 sat	9.3E+02 sat	7.3E+02 nc	7.3E+03 nc	9.3E+02	8.1E+02
	1.0E+00 i		1.0E+00 r	0	0.10	85-70-1	Butylphthalyl butylglycolate	5.5E+04 nc	1.0E+05 max	3.7E+03 nc	3.7E+04 nc		
	3.0E-03 h		3.0E-03 r	0	0.10	75-60-5	Cacodylic acid	1.6E+02 nc	3.2E+03 nc	1.1E+01 nc	1.1E+02 nc		
	5.0E-04 i	6.3E+00 i	5.7E-05 x	0	0.01	7440-43-9	Cadmium and compounds	3.7E+01 nc	9.3E+02 nc	1.1E-03 ca	1.8E+01 nc	8.0E+00	4.0E-01
							"CAL-Modified PRG" (PEA, 1994)	**9.0E+00**					

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION								CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
				V O C	skin abs. soils	CAS No.			Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFI 1/(mg/kg-d)	RfDi (mg/kg-d)											
	5.0E-01 i		5.0E-01 r	0	0.10	105-60-2	Caprolactam		2.7E+04 nc	1.0E+05 max	1.8E+03 nc	1.8E+04 nc		
8.5E-03 h	2.0E-03 i	8.6E-03 r	2.0E-03 r	0	0.10	2425-06-1	Captafol		5.2E+01 ca**	3.5E+02 ca**	7.8E-01 ca*	7.8E+00 ca*		
3.5E-03 h	1.3E-01 i	3.5E-03 r	1.3E-01 r	0	0.10	133-06-2	Captan		1.3E+02 ca*	8.6E+02 ca	1.9E+00 ca	1.9E+01 ca		
	1.0E-01 i		1.1E-01 r	0	0.10	63-25-2	Carbaryl		5.5E+03 nc	1.1E+05 nc	4.0E+02 nc	3.7E+03 nc		
2.0E-02 h		2.0E-02 r		0	0.10	86-74-8	Carbazole		2.2E+01 ca	1.5E+02 ca	3.4E-01 ca	3.4E+00 ca	6.0E-01	3.0E-02
	5.0E-03 i		5.0E-03 r	0	0.10	1563-66-2	Carbofuran		2.7E+02 nc	5.3E+03 nc	1.8E+01 nc	1.8E+02 nc		
	1.0E-01 i		2.0E-01 i	1	0.10	75-15-0	Carbon disulfide		3.5E+02 nc	1.2E+03 nc	7.3E+02 nc	1.0E+03 nc	3.2E+01	2.0E+00
1.3E-01 i	7.0E-04 i	5.3E-02 i	5.7E-04 x	1	0.10	56-23-5	Carbon tetrachloride		2.3E-01 ca**	5.2E-01 ca*	1.3E-01 ca*	1.7E-01 ca*	7.0E-02	3.0E-03
	1.0E-02 i		1.0E-02 r	0	0.10	55285-14-8	Carbosulfan		5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	1.0E-01 i		1.0E-01 r	0	0.10	5234-68-4	Carboxin		5.5E+03 nc	1.1E+05 nc	3.7E+02 nc	3.7E+03 nc		
	2.0E-03 i		2.0E-03 r	0	0.10	302-17-0	Chloral		1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
	1.5E-02 i		1.5E-02 r	0	0.10	133-90-4	Chloramben		8.2E+02 nc	1.6E+04 nc	5.5E+01 nc	5.5E+02 nc		
4.0E-01 h		4.0E-01 r		0	0.10	118-75-2	Chloranil		1.1E+00 ca	7.4E+00 ca	1.7E-02 ca	1.7E-01 ca		
3.5E-01 i	5.0E-04 i	3.5E-01 i	2.3E-05 i	0	0.04	57-74-9	Chlordane		1.6E+00 ca*	1.2E+01 ca*	1.9E-02 ca**	1.9E-01 ca*	1.0E+01	5.0E-01
	2.0E-02 i		2.0E-02 r	0	0.10	90982-32-4	Chlorimuron-ethyl		1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		
	1.0E-01 i			0	0.01	7782-50-5	Chlorine					3.7E+03 nc		
			5.7E-05 i	n/a	n/a	10049-04-4	Chlorine dioxide				2.1E-01 nc			
				1	0.10	107-20-0	Chloroacetaldehyde							
	2.0E-03 h		2.0E-03 r	0	0.10	79-11-8	Chloroacetic acid		1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
	8.5E-06 r		8.6E-06 i	1	0.10	S 532-27-4	2-Chloroacetophenone		3.2E-02 nc	1.1E-01 nc	3.1E-02 nc	5.2E-02 nc		
	4.0E-03 i		4.0E-03 r	0	0.10	106-47-8	4-Chloroaniline		2.2E+02 nc	4.3E+03 nc	1.5E+01 nc	1.5E+02 nc	7.0E-01	3.0E-02
	2.0E-02 i		5.7E-03 h	1	0.10		Chlorobenzene		5.4E+01 nc	1.8E+02 nc	2.1E+01 nc	3.9E+01 nc	1.0E+00	7.0E-02
2.7E-01 h	2.0E-02 i	2.7E-01 h	2.0E-02 r	0	0.10		Chlorobenzilate		1.6E+00 ca	1.1E+01 ca	2.5E-02 ca	2.5E-01 ca		
	2.0E-01 h		2.0E-01 r	0	0.10		p-Chlorobenzoic acid		1.1E+04 nc	1.0E+05 max	7.3E+02 nc	7.3E+03 nc		
	2.0E-02 h		2.0E-02 r	0	0.10		4-Chlorobenzotrifluoride		1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		
	2.0E-02 h		2.0E-03 h	1	0.10		2-Chloro-1,3-butadiene		3.6E+00 nc	1.2E+01 nc	7.3E+00 nc	1.4E+01 nc		
	4.0E-01 h		4.0E-01 r	1	0.10	S 109-69-3	1-Chlorobutane		4.8E+02 sat	4.8E+02 sat	1.5E+03 nc	2.4E+03 nc		
	1.4E+01 r		1.4E+01 i	1	0.10	S 75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)		3.4E+02 sat	3.4E+02 sat	5.2E+04 nc	8.7E+04 nc		
	1.4E+01 r		1.4E+01 i	1	0.10	S 75-45-6	Chlorodifluoromethane		3.4E+02 sat	3.4E+02 sat	5.1E+04 nc	8.5E+04 nc		
				1	0.10	110-75-8	2-Chloroethyl vinyl ether							
6.1E-03 i	1.0E-02 i	6.1E-02 i	1.0E-02 r	1	0.10	67-66-3	Chloroform		2.4E-01 ca	5.2E-01 ca	8.4E-02 ca	1.6E-01 ca	6.0E-01	3.0E-02
1.3E-02 h		5.3E-03 h		1	0.10	74-87-3	Chloromethane		1.2E+00 ca	2.6E+00 ca	1.1E+00 ca	1.5E+00 ca		
5.8E-01 h		5.8E-01 r		0	0.10	95-69-2	4-Chloro-2-methylaniline		7.7E-01 ca	5.2E+00 ca	1.2E-02 ca	1.2E-01 ca		
4.6E-01 h		4.6E-01 r		0	0.10	3165-93-3	4-Chloro-2-methylaniline hydrochloride		9.7E-01 ca	6.5E+00 ca	1.5E-02 ca	1.5E-01 ca		
	8.0E-02 i		8.0E-02 r	1	0.10		beta-Chloronaphthalene		3.7E+03 nc	2.4E+04 nc	2.9E+02 nc	4.9E+02 nc		
2.5E-02 h		2.5E-02 r	r	0	0.10	88-73-3	o-Chloronitrobenzene		1.8E+01 ca	1.2E+02 ca	2.7E-01 ca	2.7E+00 ca		
1.8E-02 h		1.8E-02 r	r	0	0.10	100-00-5	p-Chloronitrobenzene		2.5E+01 ca	1.7E+02 ca	3.7E-01 ca	3.7E+00 ca		
	5.0E-03 i		5.0E-03 r	1	0.10	95-57-8	2-Chlorophenol		5.9E+01 nc	2.4E+02 nc	1.8E+01 nc	3.8E+01 nc	4.0E+00	2.0E-01
	2.9E-02 r		2.9E-02 h	1	0.10	S 75-29-6	2-Chloropropane		1.6E+02 nc	5.9E+02 nc	1.0E+02 nc	1.7E+02 nc		
1.1E-02 h	1.5E-02 i	1.1E-02 r	1.5E-02 r	0	0.10	1897-45-6	Chlorothalonil		4.0E+01 ca*	2.7E+02 ca*	6.1E-01 ca*	6.1E+00 ca*		
	2.0E-02 i		2.0E-02 r	1	0.10	S 95-49-8	o-Chlorotoluene		1.5E+02 nc	5.6E+02 nc	7.3E+01 nc	1.2E+02 nc		
	2.0E-01 i		2.0E-01 r	0	0.10	101-21-3	Chlorpropham		1.1E+04 nc	1.0E+05 max	7.3E+02 nc	7.3E+03 nc		
	3.0E-03 i		3.0E-03 r	0	0.10	2921-88-2	Chlorpyrifos		1.5E+02 nc	3.2E+03 nc	1.1E+01 nc	1.1E+02 nc		
	1.0E-02 h		1.0E-02 r	0	0.10	5598-13-0	Chlorpyrifos-methyl		5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	5.0E-02 i		5.0E-02 r	0	0.10	64902-72-3	Chlorsulfuron		2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		

Key: i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION								CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDi (mg/kg-d)	V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
	8.0E-04 h		8.0E-04 r	0	0.10	60238-56-4	Chlorthiophos	4.4E+01 nc	8.6E+02 nc	2.9E+00 nc	2.9E+01 nc		
		4.2E+01 i		0	0.01	n/a	Total Chromium (1/6 ratio Cr VI/Cr III)	2.1E+02 ca	4.5E+02 ca	1.6E-04 ca		3.8E+01	2.0E+00
	5.0E-03 i	2.9E+02 i		0	0.01	7440-47-3	Chromium VI	3.0E+01 ca*	6.4E+01 ca	2.3E-05 ca	1.8E+02 nc	3.8E+01	2.0E+00
							"CAL-Modified PRG" (PEA, 1994)	**2.0E-01**			**1.6E-01**		
	6.0E-02 x		5.7E-06 x	0	0.01	7440-48-4	Cobalt	3.3E+03 nc	2.9E+04 nc	2.1E-02 nc	2.2E+03 nc		
		2.2E+00 i		0	0.01	8007-45-2	Coke Oven Emissions			3.1E-03 ca			
	3.7E-02 h			0	0.01	7440-50-8	Copper and compounds	2.8E+03 nc	7.0E+04 nc		1.4E+03 nc		
1.9E+00 h	1.0E-02 x	1.9E+00 x	1.0E-02 r	1	0.10 S	123-73-9	Crotonaldehyde	5.3E-03 ca	1.1E-02 ca	3.5E-03 ca	5.9E-03 ca		
	1.0E-01 i		1.1E-01 i	1	0.10	98-82-8	Cumene (isopropylbenzene)	1.6E+02 nc	5.2E+02 nc	4.0E+02 nc	6.6E+02 nc		
8.4E-01 h	2.0E-03 h	8.4E-01 i	2.0E-03 r	0	0.10	21725-46-2	Cyanazine	5.3E-01 ca	3.6E+00 ca	8.0E-03 ca	8.0E-02 ca		
						n/a	Cyanides						
	1.0E-01 h			0	0.10	542-62-1	Barium cyanide	5.5E+03 nc	1.0E+05 max		3.7E+03 nc		
	4.0E-02 i			0	0.10	592-01-8	Calcium cyanide	2.2E+03 nc	4.3E+04 nc		1.5E+03 nc		
	5.0E-03 i			0	0.10	544-92-3	Copper cyanide	2.7E+02 nc	5.3E+03 nc		1.8E+02 nc		
	4.0E-02 i			0	0.10	460-19-5	Cyanogen	2.2E+03 nc	4.3E+04 nc		1.5E+03 nc		
	9.0E-02 i			0	0.10	506-68-3	Cyanogen bromide	4.9E+03 nc	1.0E+05 max		3.3E+03 nc		
	5.0E-02 i			0	0.10	506-77-4	Cyanogen chloride	2.7E+03 nc	5.3E+04 nc		1.8E+03 nc		
	2.0E-02 i			0	0.10	57-12-5	Free cyanide	1.1E+03 nc	2.1E+04 nc		7.3E+02 nc	4.0E+01	2.0E+00
	2.0E-02 i		8.6E-04 i	1	0.10	74-90-8	Hydrogen cyanide	1.1E+01 nc	3.5E+01 nc	3.1E+00 nc	6.2E+00 nc		
	5.0E-02 i			0	0.10	151-50-8	Potassium cyanide	2.7E+03 nc	5.3E+04 nc		1.8E+03 nc		
	2.0E-01 i			0	0.10	506-61-6	Potassium silver cyanide	1.1E+04 nc	1.0E+05 max		7.3E+03 nc		
	1.0E-01 i			0	0.10	506-64-9	Silver cyanide	5.5E+03 nc	1.1E+05 nc		3.7E+03 nc		
	4.0E-02 i			0	0.10	143-33-9	Sodium cyanide	2.2E+03 nc	4.3E+04 nc		1.5E+03 nc		
	5.0E-02 i			0	0.10	557-21-1	Zinc cyanide	2.7E+03 nc	5.3E+04 nc		1.8E+03 nc		
	5.0E+00 i		5.0E+00 r	0	0.10	108-94-1	Cyclohexanone	1.0E+05 max	1.0E+05 max	1.8E+04 nc	1.8E+05 nc		
	2.0E-01 i		2.0E-01 r	0	0.10	108-91-8	Cyclohexylamine	1.1E+04 nc	1.0E+05 max	7.3E+02 nc	7.3E+03 nc		
	5.0E-03 i		5.0E-03 r	0	0.10	68085-85-8	Cyhalothrin/Karate	2.7E+02 nc	5.3E+03 nc	1.8E+01 nc	1.8E+02 nc		
	1.0E-02 i		1.0E-02 r	0	0.10	52315-07-8	Cypermethrin	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	7.5E-03 i		7.5E-03 r	0	0.10	88215-27-8	Cyromazine	4.1E+02 nc	8.0E+03 nc	2.7E+01 nc	2.7E+02 nc		
	1.0E-02 i		1.0E-02 r	0	0.10	1861-32-1	Dacthal	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	3.0E-02 i		3.0E-02 r	0	0.10	75-99-0	Dalapon	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
	2.5E-02 i		2.5E-02 r	0	0.10	39515-41-8	Danitol	1.4E+03 nc	2.7E+04 nc	9.1E+01 nc	9.1E+02 nc		
2.4E-01 i		2.4E-01 r		0	0.03	72-54-8	DDD	2.4E+00 ca	1.9E+01 ca	2.8E-02 ca	2.8E-01 ca	1.6E+01	8.0E-01
3.4E-01 i		3.4E-01 r		0	0.03	72-55-9	DDE	1.7E+00 ca	1.3E+01 ca	2.0E-02 ca	2.0E-01 ca	5.4E+01	3.0E+00
3.4E-01 i	5.0E-04 i	3.4E-01 i	5.0E-04 r	0	0.03	50-29-3	DDT	1.7E+00 ca*	1.3E+01 ca*	2.0E-02 ca*	2.0E-01 ca*	3.2E+01	2.0E+00
	1.0E-02 i		1.0E-02 r	0	0.10	1163-19-5	Decabromodiphenyl ether	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	4.0E-05 i		4.0E-05 r	0	0.10	8065-48-3	Demeton	2.2E+00 nc	4.3E+01 nc	1.5E-01 nc	1.5E+00 nc		
6.1E-02 h		6.1E-02 r		0	0.10	2303-16-4	Diallate	7.3E+00 ca	4.9E+01 ca	1.1E-01 ca	1.1E+00 ca		
	9.0E-04 h		9.0E-04 r	0	0.10	333-41-5	Diazinon	4.9E+01 nc	9.6E+02 nc	3.3E+00 nc	3.3E+01 nc		
	4.0E-03 x		4.0E-03 r	1	0.10	132-64-9	Dibenzofuran	2.1E+02 nc	3.2E+03 nc	1.5E+01 nc	2.4E+01 nc		
	1.0E-02 i		1.0E-02 r	0	0.10	106-37-6	1,4-Dibromobenzene	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
8.4E-02 i	2.0E-02 i	8.4E-02 r	2.0E-02 r	0	0.10	124-48-1	Dibromochloromethane	5.3E+00 ca	3.6E+01 ca	8.0E-02 ca	1.0E+00 ca	4.0E-01	2.0E-02
1.4E+00 h	5.7E-05 r	2.4E-03 h	5.7E-05 i	0	0.10	96-12-8	1,2-Dibromo-3-chloropropane	3.2E-01 ca**	2.1E+00 ca*	2.1E-01 nc	4.8E-02 ca*		
							"CAL-Modified PRG" (PEA, 1994)	**6.0E-02**		**9.6E-04**	**4.7E-03**		
8.5E+01 i	5.7E-05 r	7.7E-01 i	5.7E-05 h	1	0.10	106-93-4	1,2-Dibromoethane	4.9E-03 ca	2.9E-02 ca*	8.7E-03 ca*	7.6E-04 ca		

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDi (mg/kg-d)	V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
	1.0E-01 i		1.0E-01 r	0	0.10	84-74-2	Dibutyl phthalate	5.5E+03 nc	1.1E+05 nc	3.7E+02 nc	3.7E+03 nc	2.3E+03	2.7E+02
	3.0E-02 i		3.0E-02 r	0	0.10	1918-00-9	Dicamba	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
	9.0E-02 i		5.7E-02 h	1	0.10	95-50-1	1,2-Dichlorobenzene	3.7E+02 sat	3.7E+02 sat	2.1E+02 nc	3.7E+02 nc	1.7E+01	9.0E-01
	3.0E-02 n		2.3E-03 n	1	0.10	541-73-1	1,3-Dichlorobenzene	4.1E+01 nc	1.4E+02 nc	8.4E+00 nc	1.7E+01 nc		
2.4E-02 h	2.0E-01 n	2.4E-02 r	2.3E-01 i	1	0.10	106-46-7	1,4-Dichlorobenzene	3.0E+00 ca	7.3E+00 ca	2.8E-01 ca	4.7E-01 ca	2.0E+00	1.0E-01
4.5E-01 i		4.5E-01 r		0	0.10	91-94-1	3,3-Dichlorobenzidine	9.9E-01 ca	6.7E+00 ca	1.5E-02 ca	1.5E-01 ca	7.0E-03	3.0E-04
9.3E+00 r		9.3E+00 h		1	0.10	764-41-0	1,4-Dichloro-2-butene	7.5E-03 ca	1.8E-02 ca	7.2E-04 ca	1.2E-03 ca		
	2.0E-01 i		5.7E-02 h	1	0.10	75-71-8	Dichlorodifluoromethane	9.4E+01 nc	3.1E+02 nc	2.1E+02 nc	3.9E+02 nc		
	1.0E-01 h		1.4E-01 h	1	0.10	75-34-3	1,1-Dichloroethane	5.7E+02 nc	2.0E+03 nc	5.2E+02 nc	8.1E+02 nc	2.3E+01	1.0E+00
9.1E-02 i	2.9E-03 r	9.1E-02 i	2.9E-03 x	1	0.10	107-06-2	1,2-Dichloroethane (EDC)	3.4E-01 ca*	7.6E-01 ca*	7.4E-02 ca	1.2E-01 ca	2.0E-02	1.0E-03
6.0E-01 i	9.0E-03 i	1.8E-01 i	9.0E-03 r	1	0.10	75-35-4	1,1-Dichloroethylene	5.2E-02 ca	1.2E-01 ca	3.8E-02 ca	4.6E-02 ca	6.0E-02	3.0E-03
	1.0E-02 h		1.0E-02 r	1	0.10	156-59-2	1,2-Dichloroethylene (cis)	4.2E+01 nc	1.5E+02 nc	3.7E+01 nc	6.1E+01 nc	4.0E-01	2.0E-02
	2.0E-02 i		2.0E-02 r	1	0.10	156-60-5	1,2-Dichloroethylene (trans)	6.2E+01 nc	2.1E+02 nc	7.3E+01 nc	1.2E+02 nc	7.0E-01	3.0E-02
	3.0E-03 i		3.0E-03 r	0	0.10	120-83-2	2,4-Dichlorophenol	1.6E+02 nc	3.2E+03 nc	1.1E+01 nc	1.1E+02 nc	1.0E+00	5.0E-02
	8.0E-03 x		8.0E-03 r	0	0.10	94-82-6	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	4.4E+02 nc	8.6E+03 nc	2.9E+01 nc	2.9E+02 nc		
	1.0E-02 i		1.0E-02 r	0	0.05	94-75-7	2,4-Dichlorophenoxyacetic Acid (2,4-D)	8.4E+02 nc	1.4E+04 nc	3.7E+01 nc	3.7E+02 nc		
6.8E-02 h	1.1E-03 r	6.8E-02 r	1.1E-03 i	1	0.10	78-87-5	1,2-Dichloropropane	3.4E-01 ca*	7.6E-01 ca*	9.9E-02 ca*	1.6E-01 ca*	3.0E-02	1.0E-03
1.8E-01 h	3.0E-04 i	1.3E-01 h	5.7E-03 i	1	0.10	542-75-6	1,3-Dichloropropene	8.1E-02 ca*	1.8E-01 ca	5.2E-02 ca	8.1E-02 ca	4.0E-03	2.0E-04
	3.0E-03 i		3.0E-03 r	0	0.10	616-23-9	2,3-Dichloropropanol	1.6E+02 nc	3.2E+03 nc	1.1E+01 nc	1.1E+02 nc		
2.9E-01 i	5.0E-04 i	2.9E-01 r	1.4E-04 i	0	0.10	62-73-7	Dichlorvos	1.5E+00 ca*	1.0E+01 ca*	2.3E-02 ca*	2.3E-01 ca*		
4.4E-01 x		4.4E-01 r		0	0.10	115-32-2	Dicofol	1.0E+00 ca	6.8E+00 ca	1.5E-02 ca	1.5E-01 ca		
	3.0E-02 h		5.7E-05 h	1	0.10	77-73-6	Dicyclopentadiene	5.4E-01 nc	1.8E+00 nc	2.1E-01 nc	4.2E-01 nc		
1.6E+01 i	5.0E-05 i	1.6E+01 i	5.0E-05 r	0	0.10	60-57-1	Dieldrin	2.8E-02 ca*	1.9E-01 ca	4.2E-04 ca	4.2E-03 ca	4.0E-03	2.0E-04
	5.7E-03 h		5.7E-03 x	0	0.10	112-34-5	Diethylene glycol, monobutyl ether	3.1E+02 nc	6.1E+03 nc	2.1E+01 nc	2.1E+02 nc		
	2.0E+00 h		2.0E+00 r	0	0.10	111-90-0	Diethylene glycol, monoethyl ether	1.0E+05 max	1.0E+05 max	7.3E+03 nc	7.3E+04 nc		
	1.1E-02 h		1.1E-02 r	0	0.10	617-84-5	Diethylformamide	6.0E+02 nc	1.2E+04 nc	4.0E+01 nc	4.0E+02 nc		
1.2E-03 i	6.0E-01 i	1.2E-03 r	6.0E-01 r	0	0.10	103-23-1	Di(2-ethylhexyl)adipate	3.7E+02 ca	2.5E+03 ca	5.6E+00 ca	5.6E+01 ca		
	8.0E-01 i		8.0E-01 r	0	0.10	84-66-2	Diethyl phthalate	4.4E+04 nc	1.0E+05 max	2.9E+03 nc	2.9E+04 nc		
4.7E+03 h		4.7E+03 r		0	0.10	56-53-1	Diethylstilbestrol	9.4E-05 ca	6.4E-04 ca	1.4E-06 ca	1.4E-05 ca		
	8.0E-02 i		8.0E-02 r	0	0.10	43222-48-6	Difenzoquat (Avenge)	4.4E+03 nc	8.6E+04 nc	2.9E+02 nc	2.9E+03 nc		
	2.0E-02 i		2.0E-02 r	0	0.10	35367-38-5	Diflubenzuron	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		
	1.1E+01 r		1.1E+01 i	1	0.10	75-37-6	1,1-Difluoroethane			4.2E+04 nc	6.9E+04 nc		
	8.0E-02 i		8.0E-02 r	0	0.10	1445-75-6	Diisopropyl methylphosphonate	4.4E+03 nc	8.6E+04 nc	2.9E+02 nc	2.9E+03 nc		
	2.0E-02 i		2.0E-02 r	0	0.10	55290-64-7	Dimethipin	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		
	2.0E-04 i		2.0E-04 r	0	0.10	60-51-5	Dimethoate	1.1E+01 nc	2.1E+02 nc	7.3E-01 nc	7.3E+00 nc		
1.4E-02 h		1.4E-02 r		0	0.10	119-90-4	3,3'-Dimethoxybenzidine	3.2E+01 ca	2.1E+02 ca	4.8E-01 ca	4.8E+00 ca		
	5.7E-06 r		5.7E-06 x	1	0.10	124-40-3	Dimethylamine	6.3E-02 nc	2.5E-01 nc	2.1E-02 nc	3.5E-02 nc		
	2.0E-03 i		2.0E-03 r	0	0.10	121-69-7	N-N-Dimethylaniline	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
7.5E-01 h		7.5E-01 r		0	0.10	95-68-1	2,4-Dimethylaniline	5.9E-01 ca	4.0E+00 ca	9.0E-03 ca	9.0E-02 ca		
5.8E-01 h		5.8E-01 r		0	0.10	21436-96-4	2,4-Dimethylaniline hydrochloride	7.7E-01 ca	5.2E+00 ca	1.2E-02 ca	1.2E-01 ca		
9.2E+00 h		9.2E+00 r		0	0.10	119-93-7	3,3'-Dimethylbenzidine	4.8E-02 ca	3.3E-01 ca	7.3E-04 ca	7.3E-03 ca		
2.6E+00 x		3.5E+00 x		0	0.10	57-14-7	1,1-Dimethylhydrazine	1.7E-01 ca	1.2E+00 ca	1.9E-03 ca	2.6E-02 ca		
3.7E+01 x		3.7E+01 x		0	0.10	540-73-8	1,2-Dimethylhydrazine	1.2E-02 ca	8.1E-02 ca	1.8E-04 ca	1.8E-03 ca		
	1.0E-01 h		8.6E-03 i	0	0.10	68-12-2	N,N-Dimethylformamide	5.4E+03 nc	1.1E+05 nc	3.1E+01 nc	3.7E+03 nc		
	1.0E-03 n		1.0E-03 r	0	0.10	122-09-8	Dimethylphenethylamine	5.5E+01 nc	1.1E+03 nc	3.7E+00 nc	3.7E+01 nc		

Key : I=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
				V	skin							Migration to Ground Water	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDi (mg/kg-d)	O C	abs. soils	CAS No.		Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	DAF 20 (mg/kg)	DAF 1 (mg/kg)
	2.0E-02 i		2.0E-02 r	0	0.10	105-67-9	2,4-Dimethylphenol	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc	9.0E+00	4.0E-01
	6.0E-04 i		6.0E-04 r	0	0.10	576-26-1	2,6-Dimethylphenol	3.3E+01 nc	6.4E+02 nc	2.2E+00 nc	2.2E+01 nc		
	1.0E-03 i		1.0E-03 r	0	0.10	95-65-8	3,4-Dimethylphenol	5.5E+01 nc	1.1E+03 nc	3.7E+00 nc	3.7E+01 nc		
	1.0E+01 h		1.0E+01 r	0	0.10	131-11-3	Dimethyl phthalate	1.0E+05 max	1.0E+05 max	3.7E+04 nc	3.7E+05 nc		
	1.0E-01 I		1.0E-01 r	0	0.10	120-61-6	Dimethyl terephthalate	5.5E+03 nc	1.1E+05 nc	3.7E+02 nc	3.7E+03 nc		
	2.0E-03 i		2.0E-03 r	0	0.10	131-89-5	4,6-Dinitro-o-cyclohexyl phenol	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
	4.0E-04 h		4.0E-04 r	0	0.10	528-29-0	1,2-Dinitrobenzene	2.2E+01 nc	4.3E+02 nc	1.5E+00 nc	1.5E+01 nc		
	1.0E-04 i		1.0E-04 r	0	0.10	99-65-0	1,3-Dinitrobenzene	5.5E+00 nc	1.1E+02 nc	3.7E-01 nc	3.7E+00 nc		
	4.0E-04 h		4.0E-04 r	0	0.10	100-25-4	1,4-Dinitrobenzene	2.2E+01 nc	4.3E+02 nc	1.5E+00 nc	1.5E+01 nc		
	2.0E-03 i		2.0E-03 r	0	0.10	51-28-5	2,4-Dinitrophenol	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc	3.0E-01	1.0E-02
6.8E-01 i		6.8E-01 r		0	0.10	25321-14-6	Dinitrotoluene mixture	6.5E-01 ca	4.4E+00 ca	9.9E-03 ca	9.9E-02 ca	8.0E-04	4.0E-05
	2.0E-03 i		2.0E-03 r	0	0.10	121-14-2	2,4-Dinitrotoluene (also see Dinitrotoluene mixture)	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc	8.0E-04	4.0E-05
	1.0E-03 h		1.0E-03 r	0	0.10	606-20-2	2,6-Dinitrotoluene (also see Dinitrotoluene mixture)	5.5E+01 nc	1.1E+03 nc	3.7E+00 nc	3.7E+01 nc	7.0E-04	3.0E-05
	1.0E-03 i		1.0E-03 r	0	0.10	88-85-7	Dinoseb	5.5E+01 nc	1.1E+03 nc	3.7E+00 nc	3.7E+01 nc		
	2.0E-02 h		2.0E-02 r	0	0.10	117-84-0	di-n-Octyl phthalate	1.1E+03 nc	1.0E+04 sat	7.3E+01 nc	7.3E+02 nc	1.0E+04	1.0E+04
1.1E-02 i		1.1E-02 r		0	0.10	123-91-1	1,4-Dioxane	4.0E+01 ca	2.7E+02 ca	6.1E-01 ca	6.1E+00 ca		
1.5E+05 h		1.5E+05 h		0	0.03	1746-01-6	Dioxin (2,3,7,8-TCDD)	3.8E-06 ca	3.0E-05 ca	4.5E-08 ca	4.5E-07 ca		
	3.0E-02 i		3.0E-02 r	0	0.10	957-51-7	Diphenamid	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
	2.5E-02 i		2.5E-02 r	0	0.10	122-39-4	Diphenylamine	1.4E+03 nc	2.7E+04 nc	9.1E+01 nc	9.1E+02 nc		
8.0E-01 i		7.7E-01 i		0	0.10	122-66-7	1,2-Diphenylhydrazine	5.6E-01 ca	3.7E+00 ca	8.7E-03 ca	8.4E-02 ca		
	9.0E-03 n		9.0E-03 r	0	0.10	127-63-9	Diphenyl sulfone	4.9E+02 nc	9.6E+03 nc	3.3E+01 nc	3.3E+02 nc		
	2.2E-03 i		2.2E-03 r	0	0.10	85-00-7	Diquat	1.2E+02 nc	2.4E+03 nc	8.0E+00 nc	8.0E+01 nc		
8.6E+00 h		8.6E+00 r		0	0.10	1937-37-7	Direct black 38	5.2E-02 ca	3.5E-01 ca	7.8E-04 ca	7.8E-03 ca		
8.1E+00 h		8.1E+00 r		0	0.10	2602-46-2	Direct blue 6	5.5E-02 ca	3.7E-01 ca	8.3E-04 ca	8.3E-03 ca		
9.3E+00 h		9.3E+00 r		0	0.10	16071-86-6	Direct brown 95	4.8E-02 ca	3.2E-01 ca	7.2E-04 ca	7.2E-03 ca		
	4.0E-05 i		4.0E-05 r	0	0.10	298-04-4	Disulfoton	2.2E+00 nc	4.3E+01 nc	1.5E-01 nc	1.5E+00 nc		
	1.0E-02 i		1.0E-02 r	0	0.10	505-29-3	1,4-Dithiane	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	2.0E-03 i		2.0E-03 r	0	0.10	330-54-1	Diuron	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
	4.0E-03 i		4.0E-03 r	0	0.10	2439-10-3	Dodine	2.2E+02 nc	4.3E+03 nc	1.5E+01 nc	1.5E+02 nc		
	6.0E-03 I		6.0E-03 r	0	0.10	115-29-7	Endosulfan	3.3E+02 nc	6.4E+03 nc	2.2E+01 nc	2.2E+02 nc	1.8E+01	9.0E-01
	2.0E-02 i		2.0E-02 r	0	0.10	145-73-3	Endothall	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		
	3.0E-04 i		3.0E-04 r	0	0.10	72-20-8	Endrin	1.6E+01 nc	3.2E+02 nc	1.1E+00 nc	1.1E+01 nc	1.0E+00	5.0E-02
9.9E-03 i	2.0E-03 h	4.2E-03 i	2.9E-04 i	1	0.10	106-89-8	Epichlorohydrin	7.4E+00 nc	2.6E+01 nc	1.0E+00 nc	2.0E+00 nc		
	5.7E-03 r		5.7E-03 i	0	0.10	106-88-7	1,2-Epoxybutane	3.1E+02 nc	6.1E+03 nc	2.1E+01 nc	2.1E+02 nc		
	2.5E-02 i		2.5E-02 r	0	0.10	759-94-4	EPTC (S-Ethyl dipropylthiocarbamate)	1.4E+03 nc	2.7E+04 nc	9.1E+01 nc	9.1E+02 nc		
	5.0E-03 i		5.0E-03 r	0	0.10	16672-87-0	Ethephon (2-chloroethyl phosphonic acid)	2.7E+02 nc	5.3E+03 nc	1.8E+01 nc	1.8E+02 nc		
	5.0E-04 i		5.0E-04 r	0	0.10	563-12-2	Ethion	2.7E+01 nc	5.3E+02 nc	1.8E+00 nc	1.8E+01 nc		
	4.0E-01 h		5.7E-02 i	0	0.10	110-80-5	2-Ethoxyethanol	2.2E+04 nc	1.0E+05 max	2.1E+02 nc	1.5E+04 nc		
	3.0E-01 h		3.0E-01 r	0	0.10	111-15-9	2-Ethoxyethanol acetate	1.6E+04 nc	1.0E+05 max	1.1E+03 nc	1.1E+04 nc		
	9.0E-01 i		9.0E-01 r	1	0.10	141-78-6	Ethyl acetate	1.7E+04 nc	7.7E+04 sat	3.3E+03 nc	5.5E+03 nc		
4.8E-02 h		4.8E-02 r		1	0.10 S	140-88-5	Ethyl acrylate	2.1E-01 ca	4.5E-01 ca	1.4E-01 ca	2.3E-01 ca		
	1.0E-01 i		2.9E-01 i	1	0.10	100-41-4	Ethylbenzene	2.3E+02 sat	2.3E+02 sat	1.1E+03 nc	1.3E+03 nc	1.3E+01	7.0E-01
	4.0E-01 n		2.9E+00 i	1	0.10	75-00-3	Ethyl chloride	1.6E+03 sat	1.6E+03 sat	1.0E+04 nc	8.6E+03 nc		
	3.0E-01 h		3.0E-01 r	0	0.10	109-78-4	Ethylene cyanohydrin	1.6E+04 nc	1.0E+05 max	1.1E+03 nc	1.1E+04 nc		
	2.0E-02 h		2.0E-02 r	0	0.10	107-15-3	Ethylene diamine	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		

Key: i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION								CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)								SOIL SCREENING LEVELS	
				V	skin												Migration to Ground Water	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFI 1/(mg/kg-d)	RfDI (mg/kg-d)	O C	abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
	2.0E+00 i		2.0E+00 r	0	0.10	107-21-1	Ethylene glycol	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
	5.7E-03 r		5.7E-03 h	0	0.10	111-76-2	Ethylene glycol, monobutyl ether	3.1E+02	nc	6.1E+03	nc	2.1E+01	nc	2.1E+02	nc		
1.0E+00 h		3.5E-01 h		1	0.10	75-21-8	Ethylene oxide	1.3E-01	ca	3.4E-01	ca	1.9E-02	ca	2.4E-02	ca		
1.1E-01 h	8.0E-05 i	1.1E-01 r	8.0E-05 r	0	0.10	96-45-7	Ethylene thiourea (ETU)	4.0E+00	ca**	2.7E+01	ca**	6.1E-02	ca**	6.1E-01	ca**		
	2.0E-01 i		2.0E-01 r	1	0.10	S 60-29-7	Ethyl ether	1.8E+03	sat	1.8E+03	sat	7.3E+02	nc	1.2E+03	nc		
	9.0E-02 h		9.0E-02 r	1	0.10	S 97-63-2	Ethyl methacrylate	1.4E+02	sat	1.4E+02	sat	3.3E+02	nc	5.5E+02	nc		
	1.0E-05 i		1.0E-05 r	0	0.10	2104-64-5	Ethyl p-nitrophenyl phenylphosphorothioate	5.5E-01	nc	1.1E+01	nc	3.7E-02	nc	3.7E-01	nc		
	3.0E+00 i		3.0E+00 r	0	0.10	84-72-0	Ethylphthalyl ethyl glycolate	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc		
	8.0E-03 i		8.0E-03 r	0	0.10	101200-48-	Express	4.4E+02	nc	8.6E+03	nc	2.9E+01	nc	2.9E+02	nc		
	2.5E-04 i		2.5E-04 r	0	0.10	22224-92-6	Fenamiphos	1.4E+01	nc	2.7E+02	nc	9.1E-01	nc	9.1E+00	nc		
	1.3E-02 i		1.3E-02 r	0	0.10	2164-17-2	Fluometuron	7.1E+02	nc	1.4E+04	nc	4.7E+01	nc	4.7E+02	nc		
	6.0E-02 i			0	0.10	16984-48-8	Flouride (soluble)	3.3E+03	nc	6.4E+04	nc			2.2E+03	nc		
	8.0E-02 i		8.0E-02 r	0	0.10	59756-60-4	Fluoridone	4.4E+03	nc	8.6E+04	nc	2.9E+02	nc	2.9E+03	nc		
	2.0E-02 i		2.0E-02 r	0	0.10	56425-91-3	Flurprimidol	1.1E+03	nc	2.1E+04	nc	7.3E+01	nc	7.3E+02	nc		
	6.0E-02 i		6.0E-02 r	0	0.10	66332-96-5	Flutolanil	3.3E+03	nc	6.4E+04	nc	2.2E+02	nc	2.2E+03	nc		
	1.0E-02 i		1.0E-02 r	0	0.10	69409-94-5	Fluvalinate	5.5E+02	nc	1.1E+04	nc	3.7E+01	nc	3.7E+02	nc		
3.5E-03 i	1.0E-01 i	3.5E-03 r	1.0E-01 r	0	0.10	133-07-3	Folpet	1.3E+02	ca*	8.6E+02	ca	1.9E+00	ca	1.9E+01	ca		
1.9E-01 i		1.9E-01 r		0	0.10	72178-02-0	Fomesafen	2.3E+00	ca	1.6E+01	ca	3.5E-02	ca	3.5E-01	ca		
	2.0E-03 i		2.0E-03 r	0	0.10	944-22-9	Fonofos	1.1E+02	nc	2.1E+03	nc	7.3E+00	nc	7.3E+01	nc		
	1.5E-01 i	4.6E-02 i		0	0.10	50-00-0	Formaldehyde	8.2E+03	nc	1.0E+05	nc	1.5E-01	ca	5.5E+03	nc		
	2.0E+00 h		2.0E+00 r	0	0.10	64-18-6	Formic Acid	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
	3.0E+00 i		3.0E+00 r	0	0.10	39148-24-8	Fosetyl-al	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc		
	1.0E-03 i		1.0E-03 r	1	0.10	110-00-9	Furan	2.5E+00	nc	8.5E+00	nc	3.7E+00	nc	6.1E+00	nc		
3.8E+00 h		3.8E+00 r		0	0.10	67-45-8	Furazolidone	1.2E-01	ca	7.9E-01	ca	1.8E-03	ca	1.8E-02	ca		
	3.0E-03 i		1.4E-02 h	0	0.10	98-01-1	Furfural	1.6E+02	nc	3.2E+03	nc	5.2E+01	nc	1.1E+02	nc		
5.0E+01 h		5.0E+01 r		0	0.10	531-82-8	Furium	8.9E-03	ca	6.0E-02	ca	1.3E-04	ca	1.3E-03	ca		
3.0E-02 i		3.0E-02 r		0	0.10	60568-05-0	Furmecyclox	1.5E+01	ca	1.0E+02	ca	2.2E-01	ca	2.2E+00	ca		
	4.0E-04 i		4.0E-04 r	0	0.10	77182-82-2	Glufosinate-ammonium	2.2E+01	nc	4.3E+02	nc	1.5E+00	nc	1.5E+01	nc		
	4.0E-04 i		2.9E-04 h	0	0.10	765-34-4	Glycidaldehyde	2.2E+01	nc	4.3E+02	nc	1.0E+00	nc	1.5E+01	nc		
	1.0E-01 i		1.0E-01 r	0	0.10	1071-83-6	Glyphosate	5.5E+03	nc	1.1E+05	nc	3.7E+02	nc	3.7E+03	nc		
	5.0E-05 i		5.0E-05 r	0	0.10	69806-40-2	Haloxyfop-methyl	2.7E+00	nc	5.3E+01	nc	1.8E-01	nc	1.8E+00	nc		
	1.3E-02 i		1.3E-02 r	0	0.10	79277-27-3	Harmony	7.1E+02	nc	1.4E+04	nc	4.7E+01	nc	4.7E+02	nc		
4.5E+00 i	5.0E-04 i	4.6E+00 i	5.0E-04 r	0	0.10	76-44-8	Heptachlor	9.9E-02	ca	6.7E-01	ca	1.5E-03	ca	1.5E-02	ca	2.3E+01	1.0E+00
9.1E+00 i	1.3E-05 i	9.1E+00 i	1.3E-05 r	0	0.10	1024-57-3	Heptachlor epoxide	4.9E-02	ca*	3.3E-01	ca*	7.4E-04	ca*	7.4E-03	ca*	7.0E-01	3.0E-02
	2.0E-03 i		2.0E-03 r	0	0.10	87-82-1	Hexabromobenzene	1.1E+02	nc	2.1E+03	nc	7.3E+00	nc	7.3E+01	nc		
1.6E+00 i	8.0E-04 i	1.6E+00 i	8.0E-04 r	0	0.10	118-74-1	Hexachlorobenzene	2.8E-01	ca	1.9E+00	ca	4.2E-03	ca	4.2E-02	ca	2.0E+00	1.0E-01
7.8E-02 i	2.0E-04 h	7.7E-02 i	2.0E-04 r	0	0.10	87-68-3	Hexachlorobutadiene	5.7E+00	ca**	3.8E+01	ca**	8.7E-02	ca*	8.6E-01	ca*	2.0E+00	1.0E-01
6.3E+00 i		6.3E+00 i		0	0.04	319-84-6	HCH (alpha)	8.6E-02	ca	6.7E-01	ca	1.1E-03	ca	1.1E-02	ca	5.0E-04	3.0E-05
1.8E+00 i		1.8E+00 i		0	0.04	319-85-7	HCH (beta)	3.0E-01	ca	2.3E+00	ca	3.7E-03	ca	3.7E-02	ca	3.0E-03	1.0E-04
1.3E+00 h	3.0E-04 i	1.3E+00 r	3.0E-04 r	0	0.04	58-89-9	HCH (gamma) Lindane	4.2E-01	ca*	3.2E+00	ca	5.2E-03	ca	5.2E-02	ca	9.0E-03	5.0E-04
1.8E+00 i		1.8E+00 i		0	0.04	608-73-1	HCH-technical	3.0E-01	ca	2.3E+00	ca	3.8E-03	ca	3.7E-02	ca	3.0E-03	1.0E-04
	7.0E-03 i		2.0E-05 h	0	0.10	77-47-4	Hexachlorocyclopentadiene	3.8E+02	nc	7.1E+03	nc	7.3E-02	nc	2.6E+02	nc	4.0E+02	2.0E+01
6.2E+03 i		4.6E+03 i		0	0.10	19408-74-3	Hexachlorodibenzo-p-dioxin mixture (HxCDD)	7.2E-05	ca	4.8E-04	ca	1.5E-06	ca	1.1E-05	ca		
1.4E-02 i	1.0E-03 i	1.4E-02 i	1.0E-03 r	0	0.10	67-72-1	Hexachloroethane	3.2E+01	ca**	2.1E+02	ca**	4.8E-01	ca**	4.8E+00	ca**	5.0E-01	2.0E-02
	3.0E-04 i		3.0E-04 r	0	0.10	70-30-4	Hexachlorophene	1.6E+01	nc	3.2E+02	nc	1.1E+00	nc	1.1E+01	nc		

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
				V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	Migration to Ground Water DAF 20 (mg/kg)	Migration to Ground Water DAF 1 (mg/kg)
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFI 1/(mg/kg-d)	RfDi (mg/kg-d)										
1.1E-01 i	3.0E-03 i	1.1E-01 r	3.0E-03 r	0	0.10	121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	4.0E+00 ca*	2.7E+01 ca	6.1E-02 ca	6.1E-01 ca		
	2.9E-06 r		2.9E-06 i	0	0.10	822-06-0	1,6-Hexamethylene diisocyanate			1.0E-02 nc	1.0E-01 nc		
	6.0E-02 h		5.7E-02 i	1	0.10	110-54-3	n-Hexane	1.1E+02 sat	1.1E+02 sat	2.1E+02 nc	3.5E+02 nc		
	3.3E-02 i		3.3E-02 r	0	0.10	51235-04-2	Hexazinone	1.8E+03 nc	3.5E+04 nc	1.2E+02 nc	1.2E+03 nc		
3.0E+00 i		1.7E+01 i		0	0.10	302-01-2	Hydrazine, hydrazine sulfate	1.5E-01 ca	1.0E+00 ca	3.9E-04 ca	2.2E-02 ca		
			5.7E-03 i	0	0.10	7647-01-0	Hydrogen chloride			2.1E+01 nc			
	3.0E-03 i		2.9E-04 i	1	0.10	7783-06-4	Hydrogen sulfide			1.0E+00 nc	2.0E+00 nc		
	4.0E-02 h		4.0E-02 r	0	0.10	123-31-9	p-Hydroquinone	2.2E+03 nc	4.3E+04 nc	1.5E+02 nc	1.5E+03 nc		
	1.3E-02 i		1.3E-02 r	0	0.10	35554-44-0	Imazalil	7.1E+02 nc	1.4E+04 nc	4.7E+01 nc	4.7E+02 nc		
	2.5E-01 i		2.5E-01 r	0	0.10	81335-37-7	Imazaquin	1.4E+04 nc	1.0E+05 max	9.1E+02 nc	9.1E+03 nc		
	4.0E-02 i		4.0E-02 r	0	0.10	36734-19-7	Iprodione	2.2E+03 nc	4.3E+04 nc	1.5E+02 nc	1.5E+03 nc		
	3.0E-01 n			0	0.01	7439-89-6	Iron	2.2E+04 nc	1.0E+05 max		1.1E+04 nc		
	3.0E-01 i		3.0E-01 r	1	0.10	78-83-1	Isobutanol	1.0E+04 nc	4.0E+04 sat	1.1E+03 nc	1.8E+03 nc		
9.5E-04 i	2.0E-01 i	9.5E-04 r	2.0E-01 r	0	0.10	78-59-1	Isophorone	4.7E+02 ca*	3.2E+03 ca*	7.1E+00 ca	7.1E+01 ca	5.0E-01	3.0E-02
	1.5E-02 i		1.5E-02 r	0	0.10	33820-53-0	Isopropalin	8.2E+02 nc	1.6E+04 nc	5.5E+01 nc	5.5E+02 nc		
	1.0E-01 i		1.1E-01 r	0	0.10	1832-54-8	Isopropyl methyl phosphonic acid	5.5E+03 nc	1.1E+05 nc	4.0E+02 nc	3.7E+03 nc		
	5.0E-02 i		5.0E-02 r	0	0.10	82558-50-7	Isoxaben	2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		
1.8E+01 n		1.8E+01 r		0	0.10	143-50-0	Kepone	2.5E-02 ca	1.7E-01 ca	3.7E-04 ca	3.7E-03 ca		
	2.0E-03 i		2.0E-03 r	0	0.10	77501-63-4	Lactofen	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
PRGs Based on EPA Models, IEUBK (1994) and TRW (1996)						7439-92-1	Lead	4.0E+02 nc	1.0E+03 nc		4.0E+00 nc		
							"CAL-Modified PRG" (PEA, 1994)	1.3E+02					
	1.0E-07 i			0	0.10	78-00-2	Lead (tetraethyl)	5.5E-03 nc	1.1E-01 nc		3.7E-03 nc		
	2.0E-03 i		2.0E-03 r	0	0.10	330-55-2	Linuron	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
	2.0E-02 x			0	0.01	7439-93-2	Lithium	1.5E+03 nc	3.7E+04 nc		7.3E+02 nc		
	2.0E-01 i		2.0E-01 r	0	0.10	83055-99-6	Londax	1.1E+04 nc	1.0E+05 max	7.3E+02 nc	7.3E+03 nc		
	2.0E-02 i		2.0E-02 r	0	0.10	121-75-5	Malathion	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		
	1.0E-01 i		1.0E-01 r	0	0.10	108-31-6	Maleic anhydride	5.5E+03 nc	1.1E+05 nc	3.7E+02 nc	3.7E+03 nc		
	5.0E-01 i		5.0E-01 r	1	0.10	123-33-1	Maleic hydrazide	1.6E+03 nc	5.6E+03 nc	1.8E+03 nc	3.0E+03 nc		
	2.0E-05 h		2.0E-05 r	0	0.10	109-77-3	Malononitrile	1.1E+00 nc	2.1E+01 nc	7.3E-02 nc	7.3E-01 nc		
	3.0E-02 h		3.0E-02 r	0	0.10	8018-01-7	Mancozeb	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
6.0E-02 o	5.0E-03 i	6.0E-02 r	5.0E-03 r	0	0.10	12427-38-2	Maneb	7.4E+00 ca*	5.0E+01 ca	1.1E-01 ca	1.1E+00 ca		
	4.7E-02 i		1.4E-05 i	0	0.01	7439-96-5	Manganese and compounds	3.1E+03 nc	4.5E+04 nc	5.1E-02 nc	1.7E+03 nc		
	9.0E-05 h		9.0E-05 r	0	0.10	950-10-7	Mephosfolan	4.9E+00 nc	9.6E+01 nc	3.3E-01 nc	3.3E+00 nc		
	3.0E-02 i		3.0E-02 r	0	0.10	24307-26-4	Mepiquat	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
2.9E-02 n	1.0E-01 n	2.9E-02 r	1.0E-01 r	0	0.10	149-30-4	2-Mercaptobenzothiazole	1.5E+01 ca	1.0E+02 ca	2.3E-01 ca	2.3E+00 ca		
	3.0E-04 i			0	0.01	7487-94-7	Mercury and compounds	2.2E+01 nc	5.6E+02 nc		1.1E+01 nc		
			8.6E-05 i	n/a	n/a	7439-97-6	Mercury (elemental)			3.1E-01 nc			
	1.0E-04 i			0	0.10	22967-92-6	Mercury (methyl)	5.5E+00 nc	1.1E+02 nc		3.7E+00 nc		
	3.0E-05 i		3.0E-05 r	0	0.10	150-50-5	Merphos	1.6E+00 nc	3.2E+01 nc	1.1E-01 nc	1.1E+00 nc		
	3.0E-05 i		3.0E-05 r	0	0.10	78-48-8	Merphos oxide	1.6E+00 nc	3.2E+01 nc	1.1E-01 nc	1.1E+00 nc		
	6.0E-02 i		6.0E-02 r	0	0.10	57837-19-1	Metalaxyl	3.3E+03 nc	6.4E+04 nc	2.2E+02 nc	2.2E+03 nc		
	1.0E-04 i		2.0E-04 h	1	0.10	S 126-98-7	Methacrylonitrile	1.8E+00 nc	8.4E+00 nc	7.3E-01 nc	1.0E+00 nc		
	5.0E-05 i		5.0E-05 r	0	0.10	10265-92-6	Methamidophos	2.7E+00 nc	5.3E+01 nc	1.8E-01 nc	1.8E+00 nc		
	5.0E-01 i		5.0E-01 r	0	0.10	67-56-1	Methanol	2.7E+04 nc	1.0E+05 max	1.8E+03 nc	1.8E+04 nc		
	1.0E-03 i		1.0E-03 r	0	0.10	950-37-8	Methidathion	5.5E+01 nc	1.1E+03 nc	3.7E+00 nc	3.7E+01 nc		

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION								CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)								SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDi (mg/kg-d)	V O C	skin abs.	soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
	2.5E-02 i		2.5E-02 r	1	0.10		16752-77-5	Methomyl	4.4E+01	nc	1.5E+02	nc	9.1E+01	nc	1.5E+02	nc		
	5.0E-03 i		5.0E-03 r	0	0.10		72-43-5	Methoxychlor	2.7E+02	nc	5.3E+03	nc	1.8E+01	nc	1.8E+02	nc	1.6E+02	8.0E+00
	1.0E-03 h		5.7E-03 i	0	0.10		109-86-4	2-Methoxyethanol	5.5E+01	nc	1.1E+03	nc	2.1E+01	nc	3.7E+01	nc		
	2.0E-03 h		2.0E-03 r	0	0.10		110-49-6	2-Methoxyethanol acetate	1.1E+02	nc	2.1E+03	nc	7.3E+00	nc	7.3E+01	nc		
4.6E-02 h		4.6E-02 r		0	0.10		99-59-2	2-Methoxy-5-nitroaniline	9.7E+00	ca	6.5E+01	ca	1.5E-01	ca	1.5E+00	ca		
	1.0E+00 h		1.0E+00 r	1	0.10	S	79-20-9	Methyl acetate	2.0E+04	nc	9.2E+04	nc	3.7E+03	nc	6.1E+03	nc		
	3.0E-02 h		3.0E-02 r	1	0.10	S	96-33-3	Methyl acrylate	6.9E+01	nc	2.3E+02	nc	1.1E+02	nc	1.8E+02	nc		
2.4E-01 h		2.4E-01 r		0	0.10		95-53-4	2-Methylaniline (o-toluidine)	1.9E+00	ca	1.2E+01	ca	2.8E-02	ca	2.8E-01	ca		
1.8E-01 h		1.8E-01 r		0	0.10		636-21-5	2-Methylaniline hydrochloride	2.5E+00	ca	1.7E+01	ca	3.7E-02	ca	3.7E-01	ca		
	1.0E+00 x		1.0E+00 r	0	0.10		79-22-1	Methyl chlorocarbonate	5.5E+04	nc	1.0E+05	max	3.7E+03	nc	3.7E+04	nc		
	5.0E-04 i		5.0E-04 r	0	0.10		94-74-6	2-Methyl-4-chlorophenoxyacetic acid	2.7E+01	nc	5.3E+02	nc	1.8E+00	nc	1.8E+01	nc		
	1.0E-02 i		1.0E-02 r	0	0.10		94-81-5	4-(2-Methyl-4-chlorophenoxy) butyric acid	5.5E+02	nc	1.1E+04	nc	3.7E+01	nc	3.7E+02	nc		
	1.0E-03 i		1.0E-03 r	0	0.10		93-65-2	2-(2-Methyl-4-chlorophenoxy) propionic acid	5.5E+01	nc	1.1E+03	nc	3.7E+00	nc	3.7E+01	nc		
	1.0E-03 i		1.0E-03 r	0	0.10		16484-77-8	2-(2-Methyl-4,4-chlorophenoxy) propionic acid	5.5E+01	nc	1.1E+03	nc	3.7E+00	nc	3.7E+01	nc		
	8.6E-01 r		8.6E-01 h	0	0.10		108-87-2	Methylcyclohexane	4.7E+04	nc	1.0E+05	max	3.1E+03	nc	3.1E+04	nc		
2.5E-01 h		2.5E-01 r		0	0.10		101-77-9	4,4'-Methylenebisbenzeneamine	1.8E+00	ca	1.2E+01	ca	2.7E-02	ca	2.7E-01	ca		
1.3E-01 h	7.0E-04 h	1.3E-01 h	7.0E-04 r	0	0.10		101-14-4	4,4'-Methylene bis(2-chloroaniline)	3.4E+00	ca*	2.3E+01	ca*	5.2E-02	ca*	5.2E-01	ca*		
4.6E-02 i		4.6E-02 r		0	0.10		101-61-1	4,4'-Methylene bis(N,N'-dimethyl)aniline	9.7E+00	ca	6.5E+01	ca	1.5E-01	ca	1.5E+00	ca		
	1.0E-02 h		1.0E-02 r	0	0.10		74-95-3	Methylene bromide	5.5E+02	nc	1.1E+04	nc	3.7E+01	nc	3.7E+02	nc		
7.5E-03 i	6.0E-02 i	1.6E-03 i	8.6E-01 h	1	0.10		75-09-2	Methylene chloride	8.5E+00	ca	2.0E+01	ca	4.1E+00	ca	4.3E+00	ca	2.0E-02	1.0E-03
	1.7E-04 r		1.7E-04 i	0	0.10		101-68-8	**4,4'-Methylene diphenyl diisocyanate**	9.3E+00	nc	1.8E+02	nc	6.2E-01	nc	6.2E+00	nc		
	6.0E-01 i		2.9E-01 i	1	0.10		78-93-3	Methyl ethyl ketone	6.9E+03	nc	2.7E+04	nc	1.0E+03	nc	1.9E+03	nc		
1.1E+00 h		1.1E+00 r		0	0.10		60-34-4	Methyl hydrazine	4.0E-01	ca	2.7E+00	ca	6.1E-03	ca	6.1E-02	ca		
	8.0E-02 h		2.3E-02 h	1	0.10		108-10-1	**Methyl isobutyl ketone**	7.5E+02	nc	2.8E+03	nc	8.3E+01	nc	1.6E+02	nc		
	5.7E-04 r		5.7E-04 n	0	0.10		74-93-1	**Methyl Mercaptan**	3.1E+01	nc	6.1E+02	nc	2.1E+00	nc	2.1E+01	nc		
	1.4E+00 i		2.0E-01 i	1	0.10		80-62-6	**Methyl methacrylate**	2.2E+03	nc	7.3E+03	nc	7.3E+02	nc	1.4E+03	nc		
3.3E-02 h		3.3E-02 r		0	0.10		99-55-8	2-Methyl-5-nitroaniline	1.3E+01	ca	9.1E+01	ca	2.0E-01	ca	2.0E+00	ca		
	2.5E-04 i		2.5E-04 r	0	0.10		298-00-0	Methyl parathion	1.4E+01	nc	2.7E+02	nc	9.1E-01	nc	9.1E+00	nc		
	5.0E-02 x		5.0E-02 r	0	0.10		95-48-7	2-Methylphenol	2.7E+03	nc	5.3E+04	nc	1.8E+02	nc	1.8E+03	nc	1.5E+01	8.0E-01
	5.0E-02 x		5.0E-02 r	0	0.10		108-39-4	3-Methylphenol	2.7E+03	nc	5.3E+04	nc	1.8E+02	nc	1.8E+03	nc		
	5.0E-03 h		5.0E-03 r	0	0.10		106-44-5	4-Methylphenol	2.7E+02	nc	5.3E+03	nc	1.8E+01	nc	1.8E+02	nc		
	2.0E-02 n		2.0E-02 r	0	0.10		993-13-5	**Methyl phosphonic acid**	1.1E+03	nc	2.1E+04	nc	7.3E+01	nc	7.3E+02	nc		
	6.0E-03 h		1.1E-02 h	1	0.10	S	25013-15-4	Methyl styrene (mixture)	1.2E+02	nc	5.4E+02	nc	4.2E+01	nc	6.0E+01	nc		
	7.0E-02 h		7.0E-02 r	1	0.10	S	98-83-9	Methyl styrene (alpha)	6.8E+02	sat	6.8E+02	sat	2.6E+02	nc	4.3E+02	nc		
			8.6E-01 i	1	0.10		1634-04-4	**Methyl tertbutyl ether (MTBE)**	n/a		n/a		3.1E+03	nc	2.0E+01	nc/ca		
	1.5E-01 i		1.5E-01 r	0	0.10		51218-45-2	Metolachor (Dual)	8.2E+03	nc	1.0E+05	max	5.5E+02	nc	5.5E+03	nc		
	2.5E-02 i		2.5E-02 r	0	0.10		21087-64-9	Metribuzin	1.4E+03	nc	2.7E+04	nc	9.1E+01	nc	9.1E+02	nc		
1.8E+00 h	2.0E-04 i	1.8E+00 r	2.0E-04 r	0	0.10		2385-85-5	Mirex	2.5E-01	ca*	1.7E+00	ca	3.7E-03	ca	3.7E-02	ca		
	2.0E-03 i		2.0E-03 r	0	0.10		2212-67-1	Molinate	1.1E+02	nc	2.1E+03	nc	7.3E+00	nc	7.3E+01	nc		
	5.0E-03 h			0	0.01		7439-98-7	Molybdenum	3.7E+02	nc	9.4E+03	nc			1.8E+02	nc		
	1.0E-01 h		1.0E-01 h	0	0.10		10599-90-3	Monochloramine	5.5E+03	nc	1.1E+05	nc	3.7E+02	nc	3.7E+03	nc		
	2.0E-03 i		2.0E-03 r	0	0.10		300-76-5	Naled	1.1E+02	nc	2.1E+03	nc	7.3E+00	nc	7.3E+01	nc		
	1.0E-01 i		1.0E-01 r	0	0.10		15299-99-7	Napropamide	5.5E+03	nc	1.1E+05	nc	3.7E+02	nc	3.7E+03	nc		
	2.0E-02 i			0	0.01		7440-02-0	Nickel (soluble salts)	1.5E+03	nc	3.7E+04	nc			7.3E+02	nc	1.3E+02	7.0E+00
								"CAL-Modified PRG" (PEA, 1994)	**1.5E+02**									

Key : I=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDi (mg/kg-d)	V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
		8.4E-01 i		0	0.01	n/a	Nickel refinery dust			8.0E-03 ca			
		1.7E+00 i		0	0.01	12035-72-2	Nickel subsulfide		1.1E+04 ca	4.0E-03 ca			
	1.5E-03 x		1.5E-03 r	0	0.10	1929-82-4	Nitrapyrin	8.2E+01 nc	1.6E+03 nc	5.5E+00 nc	5.5E+01 nc		
Tap Water PRG Based on Infant NOAEL (see IRIS)						14797-55-8	Nitrate				1.0E+04 nc		
	1.0E-01 x			0	0.10	10102-43-9	Nitric Oxide	5.5E+03 nc	1.1E+05 nc		3.7E+03 nc		
Tap Water PRG Based on Infant NOAEL (see IRIS)						14797-65-0	Nitrite				1.0E+03 nc		
	6.0E-05 r		5.7E-05 h	0	0.10	88-74-4	2-Nitroaniline	3.3E+00 nc	6.4E+01 nc	2.1E-01 nc	2.2E+00 nc		
				0	0.10	99-09-2	3-Nitroaniline						
				0	0.10	100-01-6	4-Nitroaniline						
	5.0E-04 i		5.7E-04 h	1	0.10	98-95-3	Nitrobenzene	1.6E+01 nc	1.0E+02 nc	2.1E+00 nc	3.4E+00 nc	1.0E-01	7.0E-03
	7.0E-02 h		7.0E-02 r	0	0.10	67-20-9	Nitrofurantoin	3.8E+03 nc	7.5E+04 nc	2.6E+02 nc	2.6E+03 nc		
1.5E+00 h		9.4E+00 h		0	0.10	59-87-0	Nitrofurazone	3.0E-01 ca	2.0E+00 ca	7.2E-04 ca	4.5E-02 ca		
	1.0E+00 x			0	0.10	101102-44-	Nitrogen dioxide						
	1.0E-01 i		1.0E-01 r	0	0.10	556-88-7	Nitroguanidine	5.5E+03 nc	1.1E+05 nc	3.7E+02 nc	3.7E+03 nc		
	6.2E-02 o		6.2E-02 r	0	0.10	100-02-7	4-Nitrophenol	3.4E+03 nc	6.6E+04 nc	2.3E+02 nc	2.3E+03 nc		
9.4E+00 r	5.7E-03 r	9.4E+00 h	5.7E-03 r	1	0.10	79-46-9	2-Nitropropane			7.2E-04 ca	3.5E+01 ca		
5.4E+00 i		5.5E+00 i		1	0.10	924-16-3	N-Nitrosodi-n-butylamine	2.2E-02 ca	5.8E-02 ca	1.2E-03 ca	2.0E-03 ca		
2.8E+00 i		2.8E+00 r		0	0.10	1116-54-7	N-Nitrosodiethanolamine	1.6E-01 ca	1.1E+00 ca	2.4E-03 ca	2.4E-02 ca		
1.5E+02 i		1.5E+02 i		0	0.10	55-18-5	N-Nitrosodiethylamine	3.0E-03 ca	2.0E-02 ca	4.5E-05 ca	4.5E-04 ca		
5.1E+01 i		4.9E+01 i		0	0.10	62-75-9	N-Nitrosodimethylamine	8.7E-03 ca	5.9E-02 ca	1.4E-04 ca	1.3E-03 ca		
4.9E-03 i		4.9E-03 r		0	0.10	86-30-6	N-Nitrosodiphenylamine	9.1E+01 ca	6.1E+02 ca	1.4E+00 ca	1.4E+01 ca	1.0E+00	6.0E-02
7.0E+00 i		7.0E+00 r		0	0.10	621-64-7	N-Nitroso di-n-propylamine	6.3E-02 ca	4.3E-01 ca	9.6E-04 ca	9.6E-03 ca	5.0E-05	2.0E-06
2.2E+01 i		2.2E+01 r		0	0.10	10595-95-6	N-Nitroso-N-methylethylamine	2.0E-02 ca	1.4E-01 ca	3.1E-04 ca	3.1E-03 ca		
2.1E+00 i		2.1E+00 i		0	0.10	930-55-2	N-Nitrosopyrrolidine	2.1E-01 ca	1.4E+00 ca	3.1E-03 ca	3.2E-02 ca		
	1.0E-02 h		1.0E-02 r	0	0.10	99-08-1	m-Nitrotoluene	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	1.0E-02 h		1.0E-02 r	0	0.10	99-08-1	o-Nitrotoluene	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	1.0E-02 h		1.0E-02 r	0	0.10	99-99-0	p-Nitrotoluene	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	4.0E-02 i		4.0E-02 r	0	0.10	27314-13-2	Norflurazon	2.2E+03 nc	4.3E+04 nc	1.5E+02 nc	1.5E+03 nc		
	7.0E-04 i		7.0E-04 r	0	0.10	85509-19-9	NuStar	3.8E+01 nc	7.5E+02 nc	2.6E+00 nc	2.6E+01 nc		
	3.0E-03 i		3.0E-03 r	0	0.10	32536-52-0	Octabromodiphenyl ether	1.6E+02 nc	3.2E+03 nc	1.1E+01 nc	1.1E+02 nc		
	5.0E-02 i		5.0E-02 r	0	0.10	2691-41-0	Octahydro-1357-tetranitro-1357- tetrazocine (HMX)	2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		
	2.0E-03 h		2.0E-03 r	0	0.10	152-16-9	Octamethylpyrophosphoramide	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
	5.0E-02 i		5.0E-02 r	0	0.10	19044-88-3	Oryzalin	2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		
	5.0E-03 i		5.0E-03 r	0	0.10	19666-30-9	Oxadiazon	2.7E+02 nc	5.3E+03 nc	1.8E+01 nc	1.8E+02 nc		
	2.5E-02 i		2.5E-02 r	0	0.10	23135-22-0	Oxamyl	1.4E+03 nc	2.7E+04 nc	9.1E+01 nc	9.1E+02 nc		
	3.0E-03 i		3.0E-03 r	0	0.10	42874-03-3	Oxyfluorfen	1.6E+02 nc	3.2E+03 nc	1.1E+01 nc	1.1E+02 nc		
	1.3E-02 i		1.3E-02 r	0	0.10	76738-62-0	Paclobutrazol	7.1E+02 nc	1.4E+04 nc	4.7E+01 nc	4.7E+02 nc		
	4.5E-03 i		4.5E-03 r	0	0.10	4685-14-7	Paraquat	2.5E+02 nc	4.8E+03 nc	1.6E+01 nc	1.6E+02 nc		
	6.0E-03 h		6.0E-03 r	0	0.10	56-38-2	Parathion	3.3E+02 nc	6.4E+03 nc	2.2E+01 nc	2.2E+02 nc		
	5.0E-02 h		5.0E-02 r	0	0.10	1114-71-2	Pebulate	2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		
	4.0E-02 i		4.0E-02 r	0	0.10	40487-42-1	Pendimethalin	2.2E+03 nc	4.3E+04 nc	1.5E+02 nc	1.5E+03 nc		
2.3E-02 h		2.3E-02 r		0	0.10	87-84-3	Pentabromo-6-chloro cyclohexane	1.9E+01 ca	1.3E+02 ca	2.9E-01 ca	2.9E+00 ca		
	2.0E-03 i		2.0E-03 r	0	0.10	32534-81-9	Pentabromodiphenyl ether	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
	8.0E-04 i		8.0E-04 r	0	0.10	608-93-5	Pentachlorobenzene	4.4E+01 nc	8.6E+02 nc	2.9E+00 nc	2.9E+01 nc		
2.6E-01 h	3.0E-03 i	2.6E-01 r	3.0E-03 r	0	0.10	82-68-8	Pentachloronitrobenzene	1.7E+00 ca*	1.2E+01 ca	2.6E-02 ca	2.6E-01 ca		

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
				V O C	skin abs.	CAS No.		Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDi (mg/kg-d)										
1.2E-01 i	3.0E-02 i	1.2E-01 r	3.0E-02 r	0	0.25	87-86-5	Pentachlorophenol	2.5E+00 ca	1.5E+01 ca	5.6E-02 ca	5.6E-01 ca	3.0E-02	1.0E-03
	5.0E-04 n			0	0.01	7601-90-3	Perchlorate	3.7E+01 nc	9.4E+02 nc		1.8E+01 nc		
	5.0E-02 i		5.0E-02 r	0	0.10	52645-53-1	Permethrin	2.7E+03 nc	5.3E+04 nc	1.8E+02 nc	1.8E+03 nc		
	2.5E-01 i		2.5E-01 r	0	0.10	13684-63-4	Phenmedipham	1.4E+04 nc	1.0E+05 max	9.1E+02 nc	9.1E+03 nc		
	6.0E-01 i		6.0E-01 r	0	0.10	108-95-2	Phenol	3.3E+04 nc	1.0E+05 max	2.2E+03 nc	2.2E+04 nc	1.0E+02	5.0E+00
	2.0E-03 n		2.0E-03 r	0	0.10	92-84-2	Phenothiazine	1.1E+02 nc	2.1E+03 nc	7.3E+00 nc	7.3E+01 nc		
	6.0E-03 i		6.0E-03 r	0	0.10	108-45-2	m-Phenylenediamine	3.3E+02 nc	6.4E+03 nc	2.2E+01 nc	2.2E+02 nc		
	1.9E-01 h		1.9E-01 r	0	0.10	106-50-3	p-Phenylenediamine	1.0E+04 nc	1.0E+05 max	6.9E+02 nc	6.9E+03 nc		
	8.0E-05 i		8.0E-05 r	0	0.10	62-38-4	Phenylmercuric acetate	4.4E+00 nc	8.6E+01 nc	2.9E-01 nc	2.9E+00 nc		
1.9E-03 h		1.9E-03 r		0	0.10	90-43-7	2-Phenylphenol	2.3E+02 ca	1.5E+03 ca	3.5E+00 ca	3.5E+01 ca		
	2.0E-04 h		2.0E-04 r	0	0.10	298-02-2	Phorate	1.1E+01 nc	2.1E+02 nc	7.3E-01 nc	7.3E+00 nc		
	2.0E-02 i		2.0E-02 r	0	0.10	732-11-6	Phosmet	1.1E+03 nc	2.1E+04 nc	7.3E+01 nc	7.3E+02 nc		
	3.0E-04 h		8.6E-05 i	0	0.10	7803-51-2	Phosphine	1.6E+01 nc	3.2E+02 nc	3.1E-01 nc	1.1E+01 nc		
			2.8E-03 i	n/a	n/a	7664-38-2	Phosphoric acid			1.0E+01 nc			
	2.0E-05 i			0	0.01	7723-14-0	Phosphorus (white)	1.5E+00 nc	3.7E+01 nc		7.3E-01 nc		
	1.0E+00 h		1.0E+00 r	0	0.10	100-21-0	p-Phthalic acid	5.5E+04 nc	1.0E+05 max	3.7E+03 nc	3.7E+04 nc		
	2.0E+00 i		3.4E-02 h	0	0.10	85-44-9	Phthalic anhydride	1.0E+05 max	1.0E+05 max	1.2E+02 nc	7.3E+04 nc		
	7.0E-02 i		7.0E-02 r	0	0.10	1918-02-1	Picloram	3.8E+03 nc	7.5E+04 nc	2.6E+02 nc	2.6E+03 nc		
	1.0E-02 i		1.0E-02 r	0	0.10	23505-41-1	Pirimiphos-methyl	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
8.9E+00 h	7.0E-06 h	8.9E+00 r	7.0E-06 r	0	0.10		Polybrominated biphenyls	5.0E-02 ca**	3.4E-01 ca*	7.6E-04 ca*	7.6E-03 ca*		
2.0E+00 i		2.0E+00 r		0	0.14	1336-36-3	Polychlorinated biphenyls (PCBs)	2.0E-01 ca**	1.3E+00 ca*	3.4E-03 ca*	3.4E-02 ca*		
	7.0E-05 i		7.0E-05 r	0	0.14	12674-11-2	Aroclor 1016 (see PCBs for cancer endpoint)	3.4E+00 nc	6.3E+01 nc	2.6E-01 nc	2.6E+00 nc		
	2.0E-05 i		2.0E-05 r	0	0.14	11097-69-1	Aroclor 1254 (see PCBs for cancer endpoint)	9.7E-01 nc	1.8E+01 nc	7.3E-02 nc	7.3E-01 nc		
					0.13		Polynuclear aromatic hydrocarbons (PAHs)						
	6.0E-02 i		6.0E-02 r	1	0.13	83-32-9	Acenaphthene	2.6E+03 nc	2.8E+04 nc	2.2E+02 nc	3.7E+02 nc	5.7E+02	2.9E+01
	3.0E-01 i		3.0E-01 r	1	0.13	120-12-7	Anthracene	1.4E+04 nc	2.2E+05 nc	1.1E+03 nc	1.8E+03 nc	1.2E+04	5.9E+02
7.3E-01 n		3.1E-01 n		0	0.13	56-55-3	Benz[a]anthracene	5.6E-01 ca	3.6E+00 ca	2.2E-02 ca	9.2E-02 ca	2.0E+00	8.0E-02
7.3E-01 n		3.1E-01 n		0	0.13	205-99-2	Benzo[b]fluoranthene	5.6E-01 ca	3.6E+00 ca	2.2E-02 ca	9.2E-02 ca	5.0E+00	2.0E-01
7.3E-02 n		3.1E-02 n		0	0.13	207-08-9	Benzo[k]fluoranthene	5.6E+00 ca	3.6E+01 ca	2.2E-01 ca	9.2E-01 ca	4.9E+01	2.0E+00
							"CAL-Modified PRG" (PEA, 1994)	6.1E-01					
7.3E+00 i		3.1E+00 n		0	0.13	50-32-8	Benzo[a]pyrene	5.6E-02 ca	3.6E-01 ca	2.2E-03 ca	9.2E-03 ca	8.0E+00	4.0E-01
							"CAL-Modified PRG" (PEA, 1994)				1.5E-03		
7.3E-03 n		3.1E-03 n		0	0.13	218-01-9	Chrysene	5.6E+01 ca	3.6E+02 ca	2.2E+00 ca	9.2E+00 ca	1.6E+02	8.0E+00
							"CAL-Modified PRG" (PEA, 1994)	6.1E+00					
7.3E+00 n		3.1E+00 n		0	0.13	53-70-3	Dibenz[ah]anthracene	5.6E-02 ca	3.6E-01 ca	2.2E-03 ca	9.2E-03 ca	2.0E+00	8.0E-02
	4.0E-02 i		4.0E-02 r	0	0.13	206-44-0	Fluoranthene	2.0E+03 nc	3.7E+04 nc	1.5E+02 nc	1.5E+03 nc	4.3E+03	2.1E+02
	4.0E-02 i		4.0E-02 r	1	0.13	86-73-7	Fluorene	1.8E+03 nc	2.2E+04 nc	1.5E+02 nc	2.4E+02 nc	5.6E+02	2.8E+01
7.3E-01 n		3.1E-01 n		0	0.13	193-39-5	Indeno[1,2,3-cd]pyrene	5.6E-01 ca	3.6E+00 ca	2.2E-02 ca	9.2E-02 ca	1.4E+01	7.0E-01
	2.0E-02 i		8.6E-04 i	1	0.13	91-20-3	Naphthalene	5.5E+01 nc	1.9E+02 nc	3.1E+00 nc	6.2E+00 nc	8.4E+01	4.0E+00
	3.0E-02 i		3.0E-02 r	1	0.13	129-00-0	Pyrene	1.5E+03 nc	2.6E+04 nc	1.1E+02 nc	1.8E+02 nc	4.2E+03	2.1E+02
1.5E-01 i	9.0E-03 i	1.5E-01 r	9.0E-03 r	0	0.10	67747-09-5	Prochloraz	3.0E+00 ca	2.0E+01 ca	4.5E-02 ca	3.3E+02 ca		
	6.0E-03 h		6.0E-03 r	0	0.10	26399-36-0	Profluralin	3.3E+02 nc	6.4E+03 nc	2.2E+01 nc	2.2E+02 nc		
	1.5E-02 i		1.5E-02 r	0	0.10	1610-18-0	Prometon	8.2E+02 nc	1.6E+04 nc	5.5E+01 nc	5.5E+02 nc		
	4.0E-03 i		4.0E-03 r	0	0.10	7287-19-6	Prometryn	2.2E+02 nc	4.3E+03 nc	1.5E+01 nc	1.5E+02 nc		

Key: i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)								SOIL SCREENING LEVELS	
				V	skin			Residential		Industrial		Ambient Air		Tap Water		Migration to Ground Water	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDi (mg/kg-d)	O C	abs. soils	CAS No.		Soil (mg/kg)		Soil (mg/kg)		(ug/m^3)		(ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
	7.5E-02 i		7.5E-02 r	0	0.10	23950-58-5	Pronamide	4.1E+03	nc	8.0E+04	nc	2.7E+02	nc	2.7E+03	nc		
	1.3E-02 i		1.3E-02 r	0	0.10	1918-16-7	Propachlor	7.1E+02	nc	1.4E+04	nc	4.7E+01	nc	4.7E+02	nc		
	5.0E-03 i		5.0E-03 r	0	0.10	709-98-8	Propanil	2.7E+02	nc	5.3E+03	nc	1.8E+01	nc	1.8E+02	nc		
	2.0E-02 i		2.0E-02 r	0	0.10	2312-35-8	Propargite	1.1E+03	nc	2.1E+04	nc	7.3E+01	nc	7.3E+02	nc		
	2.0E-03 i		2.0E-03 r	0	0.10	107-19-7	Propargyl alcohol	1.1E+02	nc	2.1E+03	nc	7.3E+00	nc	7.3E+01	nc		
	2.0E-02 i		2.0E-02 r	0	0.10	139-40-2	Propazine	1.1E+03	nc	2.1E+04	nc	7.3E+01	nc	7.3E+02	nc		
	2.0E-02 i		2.0E-02 r	0	0.10	122-42-9	Propham	1.1E+03	nc	2.1E+04	nc	7.3E+01	nc	7.3E+02	nc		
	1.3E-02 i		1.3E-02 r	0	0.10	60207-90-1	Propiconazole	7.1E+02	nc	1.4E+04	nc	4.7E+01	nc	4.7E+02	nc		
	1.0E-02 n		1.0E-02 r	1	0.10	S 104-5-18	Iso-Propylbenzene	1.2E+02	nc	4.9E+02	nc	3.7E+01	nc	6.1E+01	nc		
	1.0E-02 n		1.0E-02 r	1	0.10	S 104-51-8	n-Propylbenzene	1.3E+02	nc	5.5E+02	nc	3.7E+01	nc	6.1E+01	nc		
	2.0E+01 h		2.0E+01 r	0	0.10	57-55-6	Propylene glycol	1.0E+05	max	1.0E+05	max	7.3E+04	nc	7.3E+05	nc		
	7.0E-01 h		7.0E-01 r	0	0.10	111-35-3	Propylene glycol, monoethyl ether	3.8E+04	nc	1.0E+05	max	2.6E+03	nc	2.6E+04	nc		
	7.0E-01 h		5.7E-01 i	0	0.10	107-98-2	Propylene glycol, monomethyl ether	3.8E+04	nc	1.0E+05	max	2.1E+03	nc	2.6E+04	nc		
2.4E-01 i	6.5E-03 r	1.3E-02 i	6.5E-03 i	1	0.10	75-56-9	Propylene oxide	1.5E+00	ca	6.8E+00	ca	5.2E-01	ca*	2.2E-01	ca		
	2.5E-01 i		2.5E-01 r	0	0.10	81335-77-5	Pursuit	1.4E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
	2.5E-02 i		2.5E-02 r	0	0.10	51630-58-1	Pydrin	1.4E+03	nc	2.7E+04	nc	9.1E+01	nc	9.1E+02	nc		
	1.0E-03 i		1.0E-03 r	0	0.10	110-86-1	Pyridine	5.5E+01	nc	1.1E+03	nc	3.7E+00	nc	3.7E+01	nc		
	5.0E-04 i		5.0E-04 r	0	0.10	13593-03-8	Quinalphos	2.7E+01	nc	5.3E+02	nc	1.8E+00	nc	1.8E+01	nc		
1.2E+01 h		1.2E+01 r		0	0.10	91-22-5	Quinoline	3.7E-02	ca	2.5E-01	ca	5.6E-04	ca	5.6E-03	ca		
1.1E-01 i	3.0E-03 i	1.1E-01 r	3.0E-03 r	0	0.10	121-82-4	RDX (Cyclonite)	4.0E+00	ca*	2.7E+01	ca	6.1E-02	ca	6.1E-01	ca		
	3.0E-02 i		3.0E-02 r	0	0.10	10453-86-8	Resmethrin	1.6E+03	nc	3.2E+04	nc	1.1E+02	nc	1.1E+03	nc		
	5.0E-02 h		5.0E-02 r	0	0.10	299-84-3	Ronnel	2.7E+03	nc	5.3E+04	nc	1.8E+02	nc	1.8E+03	nc		
	4.0E-03 i		4.0E-03 r	0	0.10	83-79-4	Rotenone	2.2E+02	nc	4.3E+03	nc	1.5E+01	nc	1.5E+02	nc		
	2.5E-02 i		2.5E-02 r	0	0.10	78587-05-0	Savey	1.4E+03	nc	2.7E+04	nc	9.1E+01	nc	9.1E+02	nc		
	5.0E-03 i			0	0.10	7783-00-8	Selenious Acid	2.7E+02	nc	5.3E+03	nc			1.8E+02	nc		
	5.0E-03 i			0	0.01	7782-49-2	Selenium	3.7E+02	nc	9.4E+03	nc			1.8E+02	nc	5.0E+00	3.0E-01
	5.0E-03 h			0	0.10	630-10-4	Selenourea	2.7E+02	nc	5.3E+03	nc			1.8E+02	nc		
	9.0E-02 i		9.0E-02 r	0	0.10	74051-80-2	Sethoxydim	4.9E+03	nc	9.6E+04	nc	3.3E+02	nc	3.3E+03	nc		
	5.0E-03 i			0	0.01	7440-22-4	Silver and compounds	3.7E+02	nc	9.4E+03	nc			1.8E+02	nc	3.4E+01	2.0E+00
1.2E-01 h	5.0E-03 i	1.2E-01 r	2.0E-03 r	0	0.10	122-34-9	Simazine	3.7E+00	ca*	2.5E+01	ca	5.6E-02	ca	5.6E-01	ca		
	4.0E-03 i		4.0E-03 r	0	0.10	26628-22-8	Sodium azide	2.2E+02	nc	4.3E+03	nc	1.5E+01	nc	1.5E+02	nc		
2.7E-01 h	3.0E-02 i	2.7E-01 r	3.0E-02 r	0	0.10	148-18-5	Sodium diethyldithiocarbamate	1.6E+00	ca	1.1E+01	ca	2.5E-02	ca	2.5E-01	ca		
	2.0E-05 i		2.0E-05 r	0	0.10	62-74-8	Sodium fluoroacetate	1.1E+00	nc	2.1E+01	nc	7.3E-02	nc	7.3E-01	nc		
	1.0E-03 h		1.0E-03 r	0	0.10	13718-26-8	Sodium metavanadate	5.5E+01	nc	1.1E+03	nc	3.7E+00	nc	3.7E+01	nc		
	6.0E-01 i			0	0.01	7440-24-6	Strontium, stable	4.5E+04	nc	1.0E+05	max			2.2E+04	nc		
	3.0E-04 i		3.0E-04 r	0	0.10	57-24-9	Strychnine	1.6E+01	nc	3.2E+02	nc	1.1E+00	nc	1.1E+01	nc		
	2.0E-01 i		2.9E-01 i	1	0.10	100-42-5	Styrene	1.7E+03	sat	1.7E+03	sat	1.1E+03	nc	1.6E+03	nc	4.0E+00	2.0E-01
	2.5E-02 i		2.5E-02 r	0	0.10	88671-89-0	Systhane	1.4E+03	nc	2.7E+04	nc	9.1E+01	nc	9.1E+02	nc		
1.5E+05 h		1.5E+05 h		0	0.03	1746-01-6	2,3,7,8-TCDD (dioxin)	3.8E-06	ca	3.0E-05	ca	4.5E-08	ca	4.5E-07	ca		
	7.0E-02 i		7.0E-02 r	0	0.10	34014-18-1	Tebuthiuron	3.8E+03	nc	7.5E+04	nc	2.6E+02	nc	2.6E+03	nc		
	2.0E-02 h		2.0E-02 r	0	0.10	3383-96-8	Temephos	1.1E+03	nc	2.1E+04	nc	7.3E+01	nc	7.3E+02	nc		
	1.3E-02 i		1.3E-02 r	0	0.10	5902-51-2	Terbacil	7.1E+02	nc	1.4E+04	nc	4.7E+01	nc	4.7E+02	nc		
	2.5E-05 h		2.5E-05 r	0	0.10	13071-79-9	Terbufos	1.4E+00	nc	2.7E+01	nc	9.1E-02	nc	9.1E-01	nc		
	1.0E-03 i		1.0E-03 r	0	0.10	886-50-0	Terbutryn	5.5E+01	nc	1.1E+03	nc	3.7E+00	nc	3.7E+01	nc		
	3.0E-04 i		3.0E-04 r	0	0.10	95-94-3	1,2,4,5-Tetrachlorobenzene	1.6E+01	nc	3.2E+02	nc	1.1E+00	nc	1.1E+01	nc		

Key: i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)				SOIL SCREENING LEVELS	
												Migration to Ground Water	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFI 1/(mg/kg-d)	RfDi (mg/kg-d)	V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)	Industrial Soil (mg/kg)	Ambient Air (ug/m^3)	Tap Water (ug/l)	DAF 20 (mg/kg)	DAF 1 (mg/kg)
2.6E-02 i	3.0E-02 i	2.6E-02 i	3.0E-02 r	1	0.10	630-20-6	1,1,1,2-Tetrachloroethane	2.8E+00 ca	6.8E+00 ca	2.6E-01 ca	4.3E-01 ca		
2.0E-01 i		2.0E-01 i		1	0.10	79-34-5	1,1,2,2-Tetrachloroethane	3.6E-01 ca	8.7E-01 ca	3.3E-02 ca	5.5E-02 ca	3.0E-03	2.0E-04
5.2E-02 n	1.0E-02 i	2.0E-03 n	1.1E-01 n	1	0.10	127-18-4	Tetrachloroethylene (PCE)	4.7E+00 ca*	1.6E+01 ca	3.3E+00 ca	1.1E+00 ca	6.0E-02	3.0E-03
							"CAL-Modified PRG" (PEA, 1994)			3.2E-01			
	3.0E-02 i		3.0E-02 r	0	0.10	58-90-2	2,3,4,6-Tetrachlorophenol	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
2.0E+01 h		2.0E+01 r		0	0.10	5216-25-1	p,a,a,a-Tetrachlorotoluene	2.2E-02 ca	1.5E-01 ca	3.4E-04 ca	3.4E-03 ca		
2.4E-02 h	3.0E-02 i	2.4E-02 r	3.0E-02 r	0	0.10	961-11-5	Tetrachlorvinphos	1.9E+01 ca*	1.2E+02 ca	2.8E-01 ca	2.8E+00 ca		
	5.0E-04 i		5.0E-04 r	0	0.10	3689-24-5	Tetraethyldithiopyrophosphate	2.7E+01 nc	5.3E+02 nc	1.8E+00 nc	1.8E+01 nc		
	8.6E-02 r		8.6E-02 n	0	0.10	109-99-9	Tetrahydrofuran	4.7E+03 nc	9.2E+04 nc	3.1E+02 nc	3.1E+03 nc		
	7.0E-05 h			0	0.01	1314-32-5	Thallic oxide	5.2E+00 nc	1.3E+02 nc		2.6E+00 nc		
	9.0E-05 i			0	0.01	563-68-8	Thallium acetate	6.7E+00 nc	1.7E+02 nc		3.3E+00 nc	7.0E-01	4.0E-01
	8.0E-05 i			0	0.01	6533-73-9	Thallium carbonate	6.0E+00 nc	1.5E+02 nc		2.9E+00 nc	7.0E-01	4.0E-01
	8.0E-05 i			0	0.01	7791-12-0	Thallium chloride	6.0E+00 nc	1.5E+02 nc		2.9E+00 nc	7.0E-01	4.0E-01
	9.0E-05 i			0	0.01	10102-45-1	Thallium nitrate	6.7E+00 nc	1.7E+02 nc		3.3E+00 nc	7.0E-01	4.0E-01
	9.0E-05 x			0	0.01	12039-52-0	Thallium selenite	6.7E+00 nc	1.7E+02 nc		3.3E+00 nc	7.0E-01	4.0E-01
	8.0E-05 i			0	0.01	7446-18-6	Thallium sulfate	6.0E+00 nc	1.5E+02 nc		2.9E+00 nc	7.0E-01	4.0E-01
	1.0E-02 i		1.0E-02 r	0	0.10	28249-77-6	Thiobencarb	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	1.0E-01 n		1.0E-01 r	0	0.10	N/A	Thiocyanate	5.5E+03 nc	1.0E+05 max	3.7E+02 nc	3.7E+03 nc		
	3.0E-02 x		3.0E-02 r	0	0.10	21564-17-0	2-(Thiocyanomethylthio)- benzothiazole (TCMTB)	1.6E+03 nc	3.2E+04 nc	1.1E+02 nc	1.1E+03 nc		
	3.0E-04 h		3.0E-04 r	0	0.10	39196-18-4	Thiofanox	1.6E+01 nc	3.2E+02 nc	1.1E+00 nc	1.1E+01 nc		
	8.0E-02 i		8.0E-02 r	0	0.10	23564-05-8	Thiophanate-methyl	4.4E+03 nc	8.6E+04 nc	2.9E+02 nc	2.9E+03 nc		
	5.0E-03 i		5.0E-03 r	0	0.10	137-26-8	Thiram	2.7E+02 nc	5.3E+03 nc	1.8E+01 nc	1.8E+02 nc		
	6.0E-01 h			0	0.01	n/a	Tin (inorganic, see tributyltin oxide for organic tin)	4.5E+04 nc	1.0E+05 max		2.2E+04 nc		
	2.0E-01 i		1.1E-01 h	1	0.10	108-88-3	Toluene	5.2E+02 sat	5.2E+02 sat	4.0E+02 nc	7.2E+02 nc	1.2E+01	6.0E-01
3.2E+00 h		3.2E+00 r		0	0.10	95-80-7	Toluene-2,4-diamine	1.4E-01 ca	9.4E-01 ca	2.1E-03 ca	2.1E-02 ca		
	6.0E-01 h		6.0E-01 r	0	0.10	95-70-5	Toluene-2,5-diamine	3.3E+04 nc	1.0E+05 max	2.2E+03 nc	2.2E+04 nc		
	2.0E-01 h		2.0E-01 r	0	0.10	823-40-5	Toluene-2,6-diamine	1.1E+04 nc	1.0E+05 max	7.3E+02 nc	7.3E+03 nc		
1.9E-01 i		1.9E-01 r		0	0.10	106-49-0	p-Toluidine	2.3E+00 ca	1.6E+01 ca	3.5E-02 ca	3.5E-01 ca		
1.1E+00 i		1.1E+00 i		0	0.10	8001-35-2	Toxaphene	4.0E-01 ca	2.7E+00 ca	6.0E-03 ca	6.1E-02 ca	3.1E+01	2.0E+00
	7.5E-03 i		7.5E-03 r	0	0.10	66841-25-	Tralomethrin	4.1E+02 nc	8.0E+03 nc	2.7E+01 nc	2.7E+02 nc		
	1.3E-02 i		1.3E-02 r	0	0.10	2303-17-5	Triallate	7.1E+02 nc	1.4E+04 nc	4.7E+01 nc	4.7E+02 nc		
	1.0E-02 i		1.0E-02 r	0	0.10	82097-50-5	Triasulfuron	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	5.0E-03 i		5.0E-03 r	0	0.10	615-54-3	1,2,4-Tribromobenzene	2.7E+02 nc	5.3E+03 nc	1.8E+01 nc	1.8E+02 nc		
	3.0E-04 i			0	0.10	56-35-9	Tributyltin oxide (TBTO)	1.6E+01 nc	3.2E+02 nc		1.1E+01 nc		
3.4E-02 h		3.4E-02 r		0	0.10	634-93-5	2,4,6-Trichloroaniline	1.3E+01 ca	8.8E+01 ca	2.0E-01 ca	2.0E+00 ca		
2.9E-02 h		2.9E-02 r		0	0.10	33663-50-2	2,4,6-Trichloroaniline hydrochloride	1.5E+01 ca	1.0E+02 ca	2.3E-01 ca	2.3E+00 ca		
	1.0E-02 i		5.7E-02 h	1	0.10	120-82-1	1,2,4-Trichlorobenzene	4.8E+02 nc	1.7E+03 sat	2.1E+02 nc	1.9E+02 nc	5.0E+00	3.0E-01
	3.5E-02 n		2.9E-01 n	1	0.10	71-55-6	1,1,1-Trichloroethane	6.8E+02 nc	1.4E+03 sat	1.0E+03 nc	7.9E+02 nc	2.0E+00	1.0E-01
5.7E-02 i	4.0E-03 i	5.6E-02 i	4.0E-03 r	1	0.10	79-00-5	1,1,2-Trichloroethane	8.2E-01 ca*	1.9E+00 ca*	1.2E-01 ca	2.0E-01 ca	2.0E-02	9.0E-04
1.1E-02 n	6.0E-03 x	6.0E-03 n	6.0E-03 r	1	0.10	79-01-6	Trichloroethylene (TCE)	2.7E+00 ca**	6.1E+00 ca*	1.1E+00 ca*	1.6E+00 ca*	6.0E-02	3.0E-03
	3.0E-01 i		2.0E-01 h	1	0.10	75-69-4	Trichlorofluoromethane	3.8E+02 nc	1.3E+03 nc	7.3E+02 nc	1.3E+03 nc		
	1.0E-01 i		1.0E-01 r	0	0.10	95-95-4	2,4,5-Trichlorophenol	5.5E+03 nc	1.1E+05 nc	3.7E+02 nc	3.7E+03 nc	2.7E+02	1.4E+01
1.1E-02 i		1.1E-02 i		0	0.10	88-06-2	2,4,6-Trichlorophenol	4.0E+01 ca	2.7E+02 ca	6.2E-01 ca	6.1E+00 ca	2.0E-01	8.0E-03
	1.0E-02 i		1.0E-02 r	0	0.10	93-76-5	2,4,5-Trichlorophenoxyacetic Acid	5.5E+02 nc	1.1E+04 nc	3.7E+01 nc	3.7E+02 nc		
	8.0E-03 i		8.0E-03 r	0	0.10	93-72-1	2-(2,4,5-Trichlorophenoxy) propionic acid	4.4E+02 nc	8.6E+03 nc	2.9E+01 nc	2.9E+02 nc		

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION							CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)								SOIL SCREENING LEVELS	
				V	skin			Residential		Industrial		Ambient Air		Tap Water		Migration to Ground Water	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)	SFi 1/(mg/kg-d)	RfDi (mg/kg-d)	O C	abs. soils	CAS No.		Soil (mg/kg)		Soil (mg/kg)		(ug/m^3)		(ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
	5.0E-03 i		5.0E-03 r	1	0.10	598-77-6	1,1,2-Trichloropropane	1.5E+01	nc	5.1E+01	nc	1.8E+01	nc	3.0E+01	nc		
7.0E+00 h	6.0E-03 i	7.0E+00 r	5.0E-03 r	1	0.10	96-18-4	1,2,3-Trichloropropane	1.4E-03	ca	3.1E-03	ca	9.6E-04	ca	1.6E-03	ca		
	5.0E-03 h		5.0E-03 r	1	0.10 S	96-19-5	1,2,3-Trichloropropene	1.1E+01	nc	3.8E+01	nc	1.8E+01	nc	3.0E+01	nc		
	3.0E+01 i		8.6E+00 h	1	0.10	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.6E+03	sat	5.6E+03	sat	3.1E+04	nc	5.9E+04	nc		
	3.0E-03 i		3.0E-03 r	0	0.10	58138-08-2	Tridiphane	1.6E+02	nc	3.2E+03	nc	1.1E+01	nc	1.1E+02	nc		
	2.0E-03 r		2.0E-03 i	1	0.10 S	121-44-8	Triethylamine	2.2E+01	nc	8.6E+01	nc	7.3E+00	nc	1.2E+01	nc		
7.7E-03 i	7.5E-03 i	7.7E-03 r	7.5E-03 r	0	0.10	1582-09-8	Trifluralin	5.8E+01	ca**	3.9E+02	ca*	8.7E-01	ca*	8.7E+00	ca*		
	5.0E-02 n		**1.7E-03 n**	1	0.10	95-63-6	**1,2,4-Trimethylbenzene**	5.1E+01	nc	1.7E+02	nc	6.2E+00	nc	1.2E+01	nc		
	5.0E-02 n		**1.7E-03 n**	1	0.10	108-67-8	**1,3,5-Trimethylbenzene**	2.1E+01	nc	7.0E+01	nc	6.2E+00	nc	1.2E+01	nc		
3.7E-02 h		3.7E-02 r		0	0.10	512-56-1	Trimethyl phosphate	1.2E+01	ca	8.1E+01	ca	1.8E-01	ca	1.8E+00	ca		
	3.0E-02 i		**3.0E-02 r**	0	0.10	99-35-4	**1,3,5-Trinitrobenzene**	1.6E+03	nc	3.2E+04	nc	1.1E+02	nc	1.1E+03	nc		
	1.0E-02 h		**1.0E-02 r**	0	0.10	479-45-8	Trinitrophenylmethylnitramine	5.5E+02	nc	1.1E+04	nc	3.7E+01	nc	3.7E+02	nc		
3.0E-02 i	5.0E-04 i	3.0E-02 r	5.0E-04 r	0	0.10	118-96-7	2,4,6-Trinitrotoluene	1.5E+01	ca**	1.0E+02	ca**	2.2E-01	ca**	2.2E+00	ca**		
	7.0E-03 h			0	0.01	7440-62-2	Vanadium	5.2E+02	nc	1.3E+04	nc			2.6E+02	nc	6.0E+03	3.0E+02
	9.0E-03 i			0	0.01	1314-62-1	Vanadium pentoxide	6.7E+02	nc	1.7E+04	nc			3.3E+02	nc	6.0E+03	3.0E+02
	2.0E-02 h			0	0.01	13701-70-7	Vanadium sulfate	1.5E+03	nc	3.7E+04	nc			7.3E+02	nc	6.0E+03	3.0E+02
	1.0E-03 i		1.0E-03 r	0	0.10	1929-77-7	Vernam	5.5E+01	nc	1.1E+03	nc	3.7E+00	nc	3.7E+01	nc		
	2.5E-02 i		2.5E-02 r	0	0.10	50471-44-8	Vinclozolin	1.4E+03	nc	2.7E+04	nc	9.1E+01	nc	9.1E+02	nc		
	1.0E+00 h		5.7E-02 i	1	0.10	108-05-4	Vinyl acetate	4.2E+02	nc	1.4E+03	nc	2.1E+02	nc	4.1E+02	nc	1.7E+02	8.0E+00
1.1E-01 r	8.6E-04 r	1.1E-01 h	8.6E-04 i	1	0.10 S	593-60-2	Vinyl bromide (bromoethene)	1.9E-01	ca*	4.2E-01	ca*	6.1E-02	ca*	1.0E-01	ca*		
1.9E+00 h		3.0E-01 h		1	0.10	75-01-4	Vinyl chloride	2.1E-02	ca	4.8E-02	ca	2.2E-02	ca	2.0E-02	ca	1.0E-02	7.0E-04
	3.0E-04 i		3.0E-04 r	0	0.10	81-81-2	Warfarin	1.6E+01	nc	3.2E+02	nc	1.1E+00	nc	1.1E+01	nc		
	2.0E+00 i		2.0E-01 x	1	0.10	108-38-3	m-Xylene	2.1E+02	sat	2.1E+02	sat	7.3E+02	nc	1.4E+03	nc	2.1E+02	1.0E+01
	2.0E+00 i		2.0E-01 x	1	0.10	95-47-6	o-Xylene	2.8E+02	sat	2.8E+02	sat	7.3E+02	nc	1.4E+03	nc	1.9E+02	9.0E+00
				1	0.10	106-42-3	p-Xylene	3.7E+02	sat	3.7E+02	sat					2.0E+02	1.0E+01
	3.0E-01 i			0	0.01	7440-66-6	Zinc	2.2E+04	nc	1.0E+05	max			1.1E+04	nc	1.2E+04	6.2E+02
	3.0E-04 i			0	0.01	1314-84-7	Zinc phosphide	2.2E+01	nc	5.6E+02	nc			1.1E+01	nc		
	5.0E-02 i		5.0E-02 r	0	0.10	12122-67-7	Zineb	2.7E+03	nc	5.3E+04	nc	1.8E+02	nc	1.8E+03	nc		

Arsenic

Arsenic is a semi-metal with widespread distribution. It is used in metallurgy to harden copper, lead, and alloys; in the manufacture of certain types of glass; and in limited pesticide applications. The largest current use is as a wood preservative. Historically, inorganic and organic forms of arsenic were widely used as medicines (ATSDR 1993a; Carson, Ellis, and McCann 1986).

In Renaissance Italy, arsenic trioxide became known as "inheritance powder" because of its use in expediting the passing on of bequests by expediting the passing on of the bequestor.

Humans are exposed to arsenic primarily through chronic ingestion of a variety of organic and inorganic forms. Food constitutes the largest source of daily exposure to arsenic. Humans consume an average of 25 to 50 micrograms per day arsenic from food. The particular form of arsenic ingested is a critical factor, because trivalent arsenic compounds are more toxic than pentavalent forms. However, individuals at hazardous waste sites are more likely to be exposed to the pentavalent form because natural oxidation processes in the environment favor this formation. Water-soluble arsenic is efficiently absorbed from the gastrointestinal tract and circulated throughout the body. Trivalent arsenic is detoxified in the liver by conversion to methylarsenic acid and dimethylarsenic acid, which are the principal forms excreted in the urine. Pentavalent arsenic is reduced to the trivalent form in the liver. The body burden of arsenic can reach considerable levels, because it can be sequestered in nails, hair, bones, teeth, skin, liver, kidneys, and lungs. There is good, but not conclusive, evidence that arsenic is an essential micronutrient in some animal species.

Adverse health effects produced by arsenic are highly dose-dependent. For example, at low concentrations, arsenic may be an essential nutrient and substitute for phosphorus in key biochemical reactions. However, at high levels arsenic has been recognized as an effective human poison with potentially lethal side effects. Large single doses produce death by cardiopulmonary collapse. Lesser doses can produce a severe form of peripheral arteriosclerosis known as blackfoot disease, which leads to gangrene of the extremities.

Chronic exposure to low levels of arsenic can produce malaise and fatigue, gastrointestinal distress, anemia and basophilic stippling, and neuropathy. The prominent pathological effect, however, is

plantar and palmar hyperpigmentation and hyperkeratotic lesions. Although these lesions in themselves do not pose a significant health concern, they may ultimately develop into malignant skin cancers and metastasize to other parts of the body.

The oral reference dose for arsenic is 0.0003 milligram per kilogram per day (mg/kg/day), with an uncertainty factor of 3. The reference dose is an estimated value; a consensus has not been reached among U.S. EPA scientists. Different interpretations of the data supports a value of two to three times the reference dose presented in IRIS. This reference dose is based on the critical effects of pathological changes in skin as well as lesions in blood vessels (EPA 1996).

Arsenic is a class A carcinogen (a known human carcinogen) based on observations of increased lung and skin cancer in exposed human populations (EPA 1996). The U.S. EPA oral and inhalation slope factors are 1.5 and 15 $(mg/kg/day)^{-1}$, respectively. Sodium arsenate has been shown to transform cells and produce sister-chromatid-exchanges *in vitro*, indicating that arsenic may be mutagenic. There is no direct evidence of carcinogenicity in laboratory animals. Cal/EPA (1994a) has an inhalation slope factor of 12 $(mg/kg/day)^{-1}$ for arsenic.

Barium

Barium is used in various alloys, paints, soap, paper, and rubber. It is also used in the manufacture of ceramics and glass. Barium is widely distributed in the environment and is usually found together with calcium. Studies suggest it may be an essential element in trace amounts since barium-free diets cause abnormal growth in laboratory animals. At elevated levels, it is among the more toxic alkaline earth metals (Stokinger 1981; Carson, Ellis, and McCann 1986; NLM 1995).

Absorption of barium compounds depends on the solubility of the compound. Approximately two percent is absorbed from the normal diet. It is distributed throughout the body, with about two-thirds being deposited in the bones. Excretion is slow, occurring primarily through the feces. Little barium is excreted in the urine, because almost all is reabsorbed in the renal tubules.

The effects of acute barium toxicity are observed primarily in skeletal muscle. The mechanism likely involves interference with potassium uptake from the gastrointestinal tract, producing a hypokalemic

condition. Following ingestion, gastrointestinal distress (nausea, vomiting, colic, diarrhea) is initially observed. Later symptoms are manifest as peripheral nervous system disturbances and electrocardiographic irregularities which can lead to cardiac fibrillation, general muscle paralysis, and death from respiratory arrest.

The chronic toxic effects of barium have not been well described, except for baritosis, a benign pneumoconiosis resulting from occupational inhalation exposures to barite, an insoluble sulfate salt.

IRIS lists an oral reference dose for barium as 0.07 mg/kg/day with an uncertainty factor of 3. The uncertainty factor accounts for the protection of sensitive individuals within a population. This reference dose is based on the critical effect of increased blood pressure in a subchronic human study. The confidence for this reference dose is medium (EPA 1996). The inhalation reference dose for barium is 0.00014 mg/kg/day with an uncertainty factor of 1,000. This reference dose is based on the critical effect of fetotoxicity in a four month rat study (EPA 1996).

Beryllium

Beryllium is a "high-tech" metal, with a few specialized uses, including fluorescent lights, nuclear reactors, nonsparking tools (copper-beryllium alloys), and lightweight structural alloys. The only compound in commercial use is the oxide, used in specialized ceramics (ATSDR 1993b; Carson, Ellis, and McCann 1986).

Beryllium is very poorly absorbed, even from the lungs -- only a fraction of a dose will enter the body. Once absorbed, it is widely distributed, with some concentration in the mineral matrix of the bone and depending on the physicochemical form of beryllium, in the liver or kidney (the organs of excretion). Excretion is very slow, with colloidal species passing through the bile into the feces and ionic species passing into the urine.

Toxic effects associated with beryllium exposure consist of irritation at the site of contact. This can lead to allergic reactions on the skin (contact dermatitis) following dermal contact and severe chemical pneumonia following inhalation. Fatalities are caused by pulmonary edema. Repeated inhalation exposure produces a syndrome called "berylliosis," which has an insidious onset characterized by

cough, chest pain, and general weakness caused by the loss of lung function due to increasing aranulomatosis. Additional signs, secondary to the lung effect, include finger "clubbing" and congestive heart failure, as well as kidney stones and various biochemical abnormalities. Oral studies produce fewer effects; a weakening of the bones is the most obvious. Animal studies have produced pulmonary cancers, but human studies have been inconclusive. The few available reproductive toxicity studies have indicated significant toxicity.

IRIS has a reference dose of 0.005 mg/kg/day and a slope factor of 4.3 $(mg/kg/day)^{-1}$ for oral exposure (EPA 1996). The EPA inhalation slope factor for beryllium is 8.4 (mg/kg/day)-1 based on lung cancer and work place exposure (EPA 1996). The reference dose is based on a rat chronic oral bioassay with an uncertainty factor of 100 to reflect interspecies conversion and sensitive human subpopulations. The slope factor is based on rat studies. Beryllium is a B2 carcinogen (a probable human carcinogen).

Cadmium

Cadmium is a rare element usually found as an impurity in zinc minerals. It is used primarily for the production of nickel-cadmium batteries and metal plating. Cadmium is also used for pigments, plastics, synthetics, and alloys (ATSDR 1993c; Carson, Ellis, and McCann 1986).

The extent to which cadmium compounds are absorbed depends on their solubility. Typically, about five percent of an oral dose is absorbed. However, various dietary factors such as calcium and iron deficiencies may stimulate absorption. Cadmium concentrates in the liver and kidneys. Excretion via the urine is very slow; the biologic half-life of cadmium has been estimated between 19 and 38 years. Therefore, cadmium is a cumulative toxicant: repeated small doses may be more harmful than the same total amount given as a single dose.

The acute toxic effects of cadmium are primarily local irritation. Oral doses produce nausea, vomiting, salivation, diarrhea, and abdominal cramps. Immediate death may be caused by shock and dehydration; renal and cardiopulmonary failure may cause death a week or so after ingestion. Several epidemics of gastrointestinal distress have resulted when cadmium leached from ceramic containers containing acidic media, such as fruit juices. Zinc and selenium can counteract cadmium toxicity.

Chronic toxicity has been seen primarily in workers exposed to cadmium fumes and dusts, and in Japanese villagers who drank cadmium-contaminated water and ate rice grown in that water. The Japanese villagers had extensive kidney damage which led to most of the other effects. Symptoms initially noted as severe joint and muscle pains (hence the name "itai-itai" or "ouch-ouch" disease) progressed to osteomalacia with consequent multiple fractures. Menopause and dietary deficiencies may have aggravated the effects of the cadmium toxicity. Other studies have found anemia, probably due to decreased iron uptake. Oral exposure to adult rats produced decreased motor skills, peripheral neuropathy, weakness, and muscle atrophy.

Parenteral doses of cadmium have been shown to decrease testosterone levels and produce adverse effects on the testes and prostate of test animals. These effects replicate results seen in workers breathing cadmium fumes. However, the effects have not been replicated in ingestion studies or seen in men exposed only orally. Large doses of cadmium in drinking water have produced teratogenesis and other adverse effects in female rats.

Cadmium has been found to be non-mutagenic or only weakly mutagenic in a wide variety of in vivo and in vitro studies.

Cadmium is a B1 carcinogen (probable human carcinogen) producing tumors in the lung, trachea, and bronchus. IRIS lists no oral slope factor for cadmium. However, IRIS lists an inhalation slope factor of 6.3 $(mg/kg/day)^{-1}$ (EPA 1996). Cal/EPA's inhalation slope factor is 15 $(mg/kg/day)^{-1}$. IRIS has an oral reference dose of 0.0005 mg/kg/day based on water consumption and another oral reference dose of 0.001 mg/kg/day based on food consumption. Proteinuria was found in chronic human oral exposure studies. An uncertainty factor of 10 was given to these oral reference doses to account for intrahuman variability to the toxicity of this chemical in the absence of specific data on sensitive individuals. The confidence for these oral reference doses is high.

Chromium

Chromium is an element that occurs naturally in many different mineralogic forms and can be present in higher concentrations at mining sites. Chromium has many industrial uses including steel fabrication, paint manufacturing, and chrome plating (ATSDR 1993d; Carson, Ellis, and McCann

1986).

The primary routes of chromium exposure are ingestion and inhalation. Its absorption from the lungs and gastrointestinal tract is significant but not complete. Chromium exists in a variety of oxidation states. Like several other elements, its toxicity depends on the particular oxidation state under investigation. Hexavalent chromium (chromium VI) is the most toxic. Examples of the more familiar forms of hexavalent chromium are the soluble salts potassium dichromate, sodium dichromate, potassium chromate, and sodium chromate. In contrast to the toxicity of the hexavalent form, trivalent chromium (chromium III) is an essential nutrient. Chromium is necessary for several biochemical reactions in carbohydrate metabolism and insulin production. Preliminary evidence indicates that hexavalent chromium is reduced *in vivo* to trivalent chromium in humans. This may represent a significant detoxification mechanism.

Acute chromium toxicity, although seldom seen, is characterized by hemorrhage and fluid loss leading to hypovolemic shock. Chronic toxicity is most commonly reported after industrial exposure to chromate, or to mixed chromate and chromic acid forms of chromium. In this setting, the routes of exposure are inhalation and dermal contact, with pathological effects developing at the site of exposure. Thus, typical symptoms of chronic exposure involve allergic contact dermatitis, skin ulcers, rhinitis, and nasal ulceration with nasal septum perforation. Indeed, this latter condition is so pathognomonic of chromium exposure that the perforations are commonly referred to as "chrome holes." Lung tumors are common in chromate-exposed workers, and particularly in those who smoke cigarettes, who appear to be predisposed. Although not as common, liver and kidney lesions have also been reported.

IRIS (EPA 1996) presents an oral reference dose of 0.005 mg/kg/day for chromium VI. The reference dose is based on a 1 year drinking study on rats. The uncertainty factor is 500 to reflect interhuman and interspecies variability and an additional factor of 5 to compensate for the less-than-lifetime exposure duration of the study. The corresponding oral reference dose for chromium III is 1 mg/kg/day, with an uncertainty factor of 1000. IRIS lists no oral slope factor for chromium VI, but lists an inhalation slope factor of 290 mg/kg/day. Cal/EPA (1994a) has oral and inhalation slope factors of 0.42 and 510 $(mg/kg/day)^{-1}$ for chromium VI, respectively.

Lead

Lead is a naturally occurring bluish-grey metal found in the earth's crust in limited amounts. The most important use for lead is in the production of metal products such as sheet lead, battery plates, bearings, solder, and weights. Paint, ceramics, roofing, caulking, ammunition, and gasoline additives also contain lead but the lead content is gradually decreasing over time due to new technology and environmental regulations such as a ban on leaded gasoline (ATSDR 1993e; Carson, Ellis, and McCann 1986).

Normal adults will absorb about 10 percent of an oral dose of an inorganic lead compound; this depends on the nature of the compound and on the individual. This absorption increases in children (up to 50 percent) and under some dietary conditions. About half the lead deposited in the alveoli is absorbed. Organic lead compounds are well absorbed, even through the skin. Most (90 to 95 percent) of the absorbed lead is deposited in the mineral matrix of the skeleton; the rest is widely distributed. Lead is not metabolized, but the lead in organolead compounds is stripped off by the liver. Lead interactions with enzymes, especially sulfur-containing enzymes, produce its toxic effects. Excretion, mostly in the urine, is very slow; the half-life of lead in bones is about 20 years.

Large single doses of lead produce fatigue, sleep disturbances, and constipation, followed by colic, anemia, and neuritis. Chronic lead poisoning produces loss of appetite, metallic taste, constipation and obstipation, anemia, pallor, malaise, weakness, insomnia, headache, nervous irritability, muscle and joint pains, fine tremors, and colic. Other effects include certain muscular weaknesses ("wrist drop") and lead encephalopathy, as well as other effects in children. The minimal toxic effects seem to be learning deficits and growth retardation in children and hypertension in middle-aged men. Exposure to low doses of lead in childhood causes long lasting effects, even in young adults.

Lead has severe reproductive toxicity. It can produce premature deliveries and spontaneous abortions in women, and sterility in men. This sensitivity to lead toxicity extends from the fetal stage to the cessation of growth after puberty.

The major population at risk is young children in low income urban areas, who combine maximum sensitivity to lead's effects with maximum exposure (automobile exhaust, old paint, and other sources).

The second most significant population at risk is pregnant women in those same areas. For these reasons, U.S. EPA recommended no lead at all in drinking water and promulgated an enforceable "action level" of 15 micrograms per liter at the tap for public water supplies.

Lead is a B2 carcinogen (probable human carcinogen) based on rat and mouse bioassays which showed statistically significant increases in renal tumors with dietary and subcutaneous exposure to soluble lead salts. However, human evidence is inadequate and no toxicity values exist at the present time. The toxic effects of lead may be evaluated using U.S. EPA's Integrated Exposure Uptake Biokinetic Model for Lead in Children and the Department of Toxic Substances Control California Lead Spread Model (EPA 1994; Cal/EPA 1994b).

Manganese

Manganese is an essential trace mineral with many oxidation states. Although its main use is in iron and copper alloys, it is also used in dry cells, in matches and pyrotechnics, and in a variety of chemical processes (ATSDR 1992).

Manganese may enter the body through various routes, where it may be absorbed, metabolized, or excreted. Only a small portion of ingested manganese is absorbed; however, absorption from the lung is more complete. Manganese is concentrated in the bone, liver, kidney, and erythrocytes. Divalent manganese is an essential component of several widely distributed enzyme systems involved in protein and energy metabolism. Manganese interacts in a variety of ways with other divalent cations, especially at high doses. Manganese is excreted in the bile, and some is reabsorbed from the small intestine.

Manganese has low acute toxicity, with the main effect being local irritation. With repeated doses, the irritation leads to a pneumonitis called "manganese pneumonia," which can be lethal. However, the main chronic effect is "manganism," a central neuropathy. This psychiatric disorder is first seen as irritability, disturbances in gait and speaking, and compulsive behavior. It progresses to a syndrome identical to Parkinson's Disease and can be treated with the same drugs. Autopsies show characteristic brain lesions and often liver lesions. There is no evidence for carcinogenicity or reproductive toxicity from excessive exposure to manganese. However, in animal studies, manganese deficiency in the

mother produces some toxicity in offspring.

IRIS has an oral reference dose of 0.14 mg/kg/day for total oral intake of manganese, with an uncertainty factor of one (EPA 1996). The EPA recommends a modifying factor of 1 when evaluating food ingestion and a modifying factor of 3 when evaluating water or soil ingestion; therefore the oral reference dose used was 0.047 mg/kg/day (EPA 1996). The reference dose is based on human chronic ingestion data for drinking water and food ingestion. An uncertainty factor of 1 is applied to drinking water reference dose due to various cross-sections of human populations. For food ingestion the uncertainty factor is also 1 to account for sensitive populations.

Nickel

Nickel occurs widely in the earth's crust, and is found in wind-blown dust and emitted from volcanos. Nickel is used in steel and in other alloys, including coin metal (Carson, Ellis, and McCann 1986; ATSDR 1993f).

Nickel is poorly absorbed and is concentrated in the kidneys and liver. Nickel is distributed mainly to the lungs but also to the liver and kidneys. It is excreted in the urine, with small amounts in the sweat and hair. Nickel is an essential trace mineral to some animals, and may be essential to humans.

Nickel has little acute toxicity, except for irritation on contact with the skin and lung. The most common effects are contact dermatitis, which can occur from nickel-containing jewelry, and allergic sensitization. Nickel is one of the most common sensitizers. The best known chronic effect of nickel is carcinogenicity in the respiratory tract after inhalation. Other effects include blood effects (increases in leukocytes and platelets, with bone marrow lesions) and development effects (testicular degeneration, and non-specific toxicity, such as lowered body weight in female rodents).

The oral reference dose in IRIS (EPA 1996) is 0.02 mg/kg/day. This reference dose was taken from a chronic oral rat study which caused decreased body and organ weights. The uncertainty factor for this oral reference dose is 300 accounting for interspecies extrapolation, protection of sensitive populations, and for inadequacies in the reproductive studies. The confidence for this oral reference dose is low. Cal/EPA (1994a) gives an inhalation slope factor of 0.91 $(mg/kg/day)^{-1}$.

Polycyclic Aromatic Hydrocarbons

Polycyclic (or polynuclear) aromatic hydrocarbons (PAHs) are a diverse class of chemicals containing three or more fused aromatic hydrocarbon rings. (Although not technically classified as PAHs, the 2-member ringed compounds, naphthalene and 2-methylnaphthalene are included in this discussion of PAHs.) They are formed during the incomplete burning of organic substances such as coal, oil, and gas. These compounds are found in the air attached to dust particles, and they are emitted from vehicle exhausts, asphalt roads, and wood- and coal-burning furnaces. With the exception of naphthalene, anthracene, acenaphthene, fluorene, phenanthrene, and fluoranthene, the only known use of PAHs is for research purposes. Historically, the principal use of naphthalene was the production of phthalic anhydride. However, o-xylene is replacing naphthalene for this use. The other major uses of naphthalene are in carbamate insecticides, surface active agents, resins, as a synthetic tanning agent, and as a moth repellant (moth balls). The other listed PAH have a variety of small-scale, specialized uses, such as intermediates in dye synthesis (all of them), scintillation counter crystals (anthracene), and liners for steel and ductile iron drinking water pipes and storage tanks (fluoranthene). The carcinogenic PAHs discussed here include benzo(a)anthracene, benzo(a)pyrene (BAP), benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene. BAP is the most studied PAH and one of the most potent; it is generally taken as the prototype. The noncarcinogenic PAHs include 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(g,h,i)perylene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene (ATSDR 1990a; ATSDR 1990b; ATSDR 1990c; ATSDR 1990d; ATSDR 1995a; ATSDR 1995b).

Absorption of BAP and other PAHs has usually been demonstrated indirectly, because toxic effects have been seen after oral and inhalation exposure. Some dermal absorption also occurs. PAHs are oxidized in the liver by an enzyme, aryl hydrocarbon hydroxylase (AHH), to the epoxide, which hydrolyses to the more water-soluble hydroxy or dihydroxy derivative. The metabolites are the active forms of the chemicals; variations in the formation (amount, rate, products) of these metabolites account for the different effects of the various PAHs. PAHs also cause the synthesis of greater quantities of AHH and other drug metabolizing enzymes; therefore, simultaneous exposure to PAHs and other toxicants increases or decreases the toxicity of the other chemicals. PAHs are excreted as a large variety of oxidized metabolites and conjugated metabolites, through the bile into the feces and, to a lesser extent, in the urine.

Single, acute oral and dermal doses of PAHs are practically nontoxic to animals; no human data are available. Repeated doses of straight-chain PAHs (naphthalene, anthracene, pentacene, and others) also have little effect. These PAHs in large doses produce weight loss, possibly blood effects (even aplastic anemia), and some liver and kidney lesions, but do not seem to be carcinogenic. Other PAHs, such as BAP, are carcinogenic after repeated doses through the oral, inhalation, and dermal routes. Tumors develop at the entry site (stomach, respiratory tract, skin) and in the liver, and occasionally at other sites. Other effects are similar to those of the straight-chain PAHs. Dibenzo(a,h)anthracene was the first pure chemical shown to be carcinogenic to animals in experiments during the 1920s, while coal soot, now known to be primarily PAHs, was recognized as the cause of scrotal cancers in chimney sweeps in 1775. Several of the PAHs, including BAP, are routinely used in the laboratory to induce tumors in rodents; a few laboratory workers have developed similar tumors from accidental exposures to these chemicals. Except for those laboratory accidents, all human data are for exposure to complex mixtures where it is impossible to determine the effects of specific chemicals. However, PAHs are believed to be the principal carcinogenic component of tobacco smoke and similar mixtures. PAHs are usually highly mutagenic if activated by liver enzymes. The carcinogenic PAHs are also immunotoxic; the more potent carcinogens are also more potent immunosuppressants.

PAHs have little, if any, reproductive toxicity in the few available studies, except in parenteral studies of BAP in rodents. Most adverse effects were nonspecific, such as decreased birth weight and sterility, and were at relatively high doses. The potency of BAP as a reproductive toxicant was markedly affected by inborn differences in metabolism among various strains of mice, emphasizing the importance of metabolism to the toxicity of these compounds. Decreased maternal weight gain and hematological changes were seen in pregnant rats administered BAP daily during gestation.

According to IRIS (EPA 1996) and HEAST (EPA 1995), the carcinogenic PAHs are B2 carcinogens (probable human carcinogens). Cal/EPA (1994a) lists BAP's oral and inhalation slope factors as 12 and 3.9 $(mg/kg/day)^{-1}$, and dibenzo(a,h)anthracene's oral and inhalation slope factors as 4.1 $(mg/kg/day)^{-1}$. Oral slope factors for carcinogenic PAHs other than BAP are based on Cal/EPA potency equivalency factor scheme (Cal/EPA 1994a). The following toxicity values were used for carcinogenic PAHs.

	Potency Equivalency	Slope Factor

Compound	Factor Applied	$(mg/kg/day)^{-1}$
Benzo(a)anthracene	0.1	1.2
Benzo(a)pyrene	1.0	12
Benzo(b)fluoranthene	0.1	1.2
Benzo(k)fluoranthene	0.1	1.2
Chrysene	0.01	0.12
Indeno(1,2,3-cd)pyrene	0.1	1.2

The following reference doses were obtained from IRIS (EPA 1996):

Compound	Reference Dose (mg/kg/day)
Acenaphthene	0.06
Anthracene	0.3
Fluoranthene	0.04
Fluorene	0.04
Pyrene	0.03

REFERENCES

ATSDR. 1990a. Toxicological Profile for Benz(a)anthracene. TP-88/04.

ATSDR. 1990b. Toxicological Profile for Benzo(a)pyrene. TP-88/05.

ATSDR. 1990c. Toxicological Profile for Benzo(b)fluoranthene. TP-88/06.

ATSDR. 1990d. Toxicological Profile for Chrysene. TP-88/11.

ATSDR. 1992. Toxicological Profile for Manganese. TP-91/19.

ATSDR. 1993a. Toxicological Profile Update for Arsenic. TP-92/02.

ATSDR. 1993b. Toxicological Profile Update for Beryllium. TP-92/04.

ATSDR. 1993c. Toxicological Profile Update for Cadmium. TP-92/06.

ATSDR. 1993d. Toxicological Profile Update for Chromium. TP-92/08.

ATSDR. 1993e. Toxicological Profile Update for Lead. TP-91/19.

ATSDR. 1993f. Toxicological Profile Update for Nickel. TP-92/14.

ATSDR. 1995a. Toxicological Profile Update for Naphthalene.

ATSDR. 1995b. Toxicological Profile Update for Polycyclic Aromatic Hydrocarbons. (PAHs).

California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA). 1994a. Memorandum Regarding California Cancer Potency Factors: Update. From Standards and Criteria Work Group. To Cal/EPA Departments, Boards, and Offices. November 1.

Cal/EPA. 1994b. The Blood Lead Computer Model. Department of Toxic Substances Control (DTSC).

Carson, Bonnie L., Harry V. Ellis III, and Joy L. McCann. 1986. *Toxicology and Biological Monitoring of Metals in Humans*. Lewis Publishers, Inc. Chelsea, Michigan.

U.S. Environmental Protection Agency (EPA). 1994. Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children. EPA/540/R-93/081. February.

EPA. 1995. Health Effects Assessment Summary Tables. Fiscal Year-1995 Annual. U.S. EPA 540/R-95/036. May.

EPA. 1996. Integrated Risk Information System (IRIS) Online Database. OEHHA. Environmental Criteria and Assessment Office.

Stokinger, H.G. 1981. "The Metals" George D. Clayton and Florence E. Clayton. *Patty's Industrial Hygiene and Toxicology*. Third Revised Edition, Volume 2A. New York, John Wiley and Sons.

National Library of Medicine (NLM). 1995. Hazardous Substances Database (HSDB) on the Toxicology Information Network (Toxnet). Bethesda, Maryland.

APPENDIX J

REGION 9 PRELIMINARY REMEDIATION GOALS

Subject: Region 9 Preliminary Remediation Goals (PRGs) 1998

From: Stanford J. Smucker, Ph.D.
Regional Toxicologist (SFD-8-B)
Technical Support Team

To: PRG Table Mailing List

Please find the annual update to the Region 9 PRG table. Risk-based PRGs presented in the "lookup" table are useful tools for evaluating and cleaning up contaminated sites. They are being used to streamline and standardize all stages of the risk decision-making process. If you are not currently on the PRG table mailing list but would like to be, please call Lynn Trujillo (415.744.2419) or email her (Trujillo.Dianna@epamail.epa.gov) and leave your name, address, and phone number.

EPA Region 9 has established a homepage on the World Wide Web which you can find at **http://www.epa.gov/region 09/**. Once you reach our website, simply scroll down to and click on "Solid and Hazardous Waste Programs" followed by "Preliminary Remediation Goals". You may want to set a bookmark to ease future access.

The PRG '98 table can be browsed online. It includes information not available in the hard copy sent out to folks on the mailing list. Additional information includes pathway specific PRGs, non-cancer PRGs for carcinogenic substances, and physical-chemical information used to estimate volatilization factors (VF). The table can also be downloaded for use with Lotus or Excel software. Please note that the downloadable files contain the same information as can be browsed online, though you will need to unzip the files and display the hidden columns to see all of the information.

Region 9 risk-based PRGs are "evergreen" and have evolved as new methodologies and parameters have been developed. Changes that have occurred from the 1996 table reflect one or more of the following: (1) updates in toxicity information, (2) revisions in dermal exposure factors, or (3) harmonization of physical-chemical information with *Soil Screening Guidance* issued by EPA's Office of Solid Waste and Emergency Response (OSWER), dated April 1996. These changes are described in the preamble (see below).

Updates to EPA toxicity values were obtained from IRIS, HEAST, or the National Center for Environmental Assessment (NCEA) through March 1998. To help users rapidly identify substances with new or revised toxicity values, the PRGs for these contaminants are printed in boldface type in the table.

Before relying on any number in the table, it is recommended that the user verify the numbers with an agency toxicologist or risk assessor because the toxicity / exposure information in the table may contain errors or default assumptions that need to be refined based on further evaluation. If you find an error please send me a note via email at smucker.stan@epamail.epa.gov or fax at 415.744.1916.

DISCLAIMER

Preliminary remediation goals (PRGs) focus on common exposure pathways and may not consider all exposure pathways encountered at CERCLA / RCRA sites (Exhibit 1-1). PRGs do not consider impact to groundwater or address ecological concerns. PRGs are specifically not intended as a (1) stand-alone decision-making tool, (2) as a substitute for EPA guidance for preparing baseline risk assessments, or (3) a rule to determine if a waste is hazardous under RCRA.

The guidance set out in this document is not final Agency action. It is not intended, nor can it be relied upon to create any rights enforceable by any party in litigation with the United States. EPA officials may decide to follow the guidance provided herein, or act at variance with the guidance, based on an analysis of specific circumstances. The Agency also reserves the right to change this guidance at any time without public notice.

1.0 INTRODUCTION

Region 9 Preliminary Remediation Goals (PRGs) are risk-based tools for evaluating and cleaning up contaminated sites. They are being used to streamline and standardize all stages of the risk decision-making process.

The Region 9 PRG table combines current EPA toxicity values with "standard" exposure factors to estimate contaminant concentrations in environmental media (soil, air, and water) that are considered protective of humans, including sensitive groups, over a lifetime. Chemical concentrations above these levels would not automatically designate a site as "dirty" or trigger a response action. However, exceeding a PRG suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate. Further evaluation may include additional sampling, consideration of ambient levels in the environment, or a reassessment of the assumptions contained in these screening-level estimates (e.g. appropriateness of route-to-route extrapolations, appropriateness of using chronic toxicity values to evaluate childhood exposures, appropriateness of generic exposure factors for a specific site etc.).

The PRG concentrations presented in the table can be used to screen pollutants in environmental media, trigger further investigation, and provide an initial cleanup goal if applicable. When considering PRGs as preliminary goals, residential concentrations should be used for maximum beneficial uses of a property. Industrial concentrations are included in the table as an alternative cleanup goal for soils. In general, it is not recommended that industrial PRGs be used for screening sites unless they are used in conjunction with residential values.

Before applying PRGs as screening tools or initial goals, the user of the table should consider whether the exposure pathways and exposure scenarios at the site are fully accounted for in the PRG calculation. Region 9 PRG concentrations are based on exposure pathways for which generally accepted methods, models, and assumptions have been developed (i.e. ingestion, dermal contact, and inhalation) for specific land-use conditions and do not consider impact to groundwater or ecological receptors (see Developing a Conceptual Site Model below).

EXHIBIT 1-1
TYPICAL EXPOSURE PATHWAYS BY MEDIUM
FOR RESIDENTIAL AND INDUSTRIAL LAND USES[a]

EXPOSURE PATHWAYS, ASSUMING:		
MEDIUM	RESIDENTIAL LAND USE	INDUSTRIAL LAND USE
Ground Water	***Ingestion from drinking***	Ingestion from drinking
	Inhalation of volatiles	Inhalation of volatiles
	Dermal absorption from bathing	Dermal absorption
Surface Water	***Ingestion from drinking***	Ingestion from drinking
	Inhalation of volatiles	Inhalation of volatiles
	Dermal absorption from bathing	Dermal absorption
	Ingestion during swimming	
	Ingestion of contaminated fish	
Soil	***Ingestion***	***Ingestion***
	Inhalation of particulates	***Inhalation of particulates***
	Inhalation of volatiles	***Inhalation of volatiles***
	Exposure to indoor air from soil gas	Exposure to indoor air from soil gas
	Exposure to ground water contaminated by soil leachate	Exposure to ground water contaminated by soil leachate
	Ingestion via plant, meat, or dairy products	Inhalation of particulates from trucks and heavy equipment
	Dermal absorption	***Dermal absorption***

Footnote:
[a]Exposure pathways considered in the PRG calculations are indicated in boldface italics.

2.0 READING THE PRG TABLE

2.1 General Considerations

With the exceptions described below, PRGs are chemical concentrations that correspond to fixed levels of risk (i.e. either a one-in-one million [10^{-6}] cancer risk or a noncarcinogenic hazard quotient of 1) in soil, air, and water. In most cases, where a substance causes both cancer and noncancer (systemic) effects, the 10^{-6} cancer risk will result in a more stringent criteria and consequently this value is presented in the hard copy of the table. PRG concentrations that equate to a 10^{-6} cancer risk are indicated by "ca". PRG concentrations that equate to a hazard quotient of 1 for noncarcinogenic concerns are indicated by "nc".

If the risk-based concentrations are to be used for site screening, it is recommended that both cancer and noncancer-based PRGs be obtained. All PRG values can be obtained in the electronic version of the table (e.g. noncancer PRGs for a carcinogenic substance), by displaying the hidden sections of the spreadsheet. To view or download an electronic copy of the table, simply access EPA Region 9's homepage at:

http://www.epa.gov/region09/waste/sfund/prg/index.html

It has come to my attention that some users have been multiplying the cancer PRG concentrations by 10 or 100 to set "action levels" for triggering remediation or to set less stringent cleanup levels for a specific site after considering non-risk-based factors such as ambient levels, detection limits, or technological feasibility. This risk management practice recognizes that there may be a range of values that may be "acceptable" for carcinogenic risk (EPA's cancer risk range is from 10^{-6} to 10^{-4}). However, this practice could lead one to overlook serious noncancer health threats and it is strongly recommended that the user consult with a toxicologist or regional risk assessor before doing this. For carcinogens, I have indicated by asterisk ("ca*") in the PRG table where the noncancer PRGs would be exceeded if the cancer value that is displayed is multiplied by 100. Two stars ("ca**") indicate that the noncancer values would be exceeded if the cancer PRG were multiplied by 10. There is no range of "acceptable" noncarcinogenic "risk" so that under no circumstances should noncancer PRGs be multiplied by 10 or 100, when setting final cleanup criteria.

In general, PRG concentrations in the table are risk-based but for soil there are two important exceptions: (1) for several volatile chemicals, PRGs are based on the soil saturation equation ("sat") and (2) for relatively less toxic inorganic and semivolatile contaminants, a non-risk based "ceiling limit" concentration is given as 10^{5} mg/kg ("max").

Also included in the PRG table are California EPA PRGs ("CAL-Modified PRGs") for specific chemicals where CAL-EPA values may be more restrictive than the federal values; and, soil screening levels (SSLs) for protection of groundwater (see Section 2.3 below).

2.2 Toxicity Values

EPA toxicity values, known as noncarcinogenic reference doses (RfD) and carcinogenic slope

factors (SF) were obtained from IRIS, HEAST, and NCEA (formerly ECAO) through March 1998. The priority among sources of toxicological constants used are as follows: (1) IRIS (indicated by "i"), (2) HEAST ("h"), (3) NCEA ("n"), (4) withdrawn from IRIS or HEAST and under review ("x") or obtained from other EPA documents ("o").

To help users rapidly identify substances with new toxicity values, these chemicals are printed in boldface type. This issue of the PRG table contains new or revised toxicity values for acifluorfen, aniline, barium, benzene, 1,1-biphenyl, bromobenzene, butylbenzenes, chlordane, 1,3 dichlorobenzene, dimethylphenethylamine, diphenylsulfone, ethyl chloride, iron, isobutane, mercaptobenzothiazole, methyl mercaptan, methyl phosphonic acid, MTBE, napthylamine, 4-nitrophenol, perchlorate, phenothiazine, PCB, PCE, polychlorinated terphenyls, thiocyanate, and trimethylbenzenes.

Route-to-route extrapolations ("r") were frequently used when there were no toxicity values available for a given route of exposure. Oral cancer slope factors ("SFo") and reference doses ("RfDo") were used for both oral and inhaled exposures for organic compounds lacking inhalation values. Inhalation slope factors ("SFi") and inhalation reference doses ("RfDi") were used for both inhaled and oral exposures for organic compounds lacking oral values. Route extrapolations were not performed for inorganics due to portal of entry effects and known differences in absorption efficiency for the two routes of exposure.

An additional route extrapolation is the use of oral toxicity values for evaluating dermal exposures. For many chemicals, a scientifically defensible data base does not exist for making an adjustment of an oral slope factor/RfD to estimate a dermal toxicity value (see Section 4.3).

Although route-to-route methods are a useful screening procedure, the appropriateness of these default assumptions for specific contaminants should be verified by a toxicologist or regional risk assessor.

2.3 Soil Screening Levels

Generic, soil screening levels (SSLs) for the protection of groundwater have been included in the PRG table for 100 of the most common contaminants at Superfund sites. Generic SSLs are derived using default values in standardized equations presented in *Soil Screening Guidance* (available from NTIS as document numbers PB96-963502 and PB96-963505 or EPA/540/R-95/128 and EPA/540/R-96/018).

The SSLs were developed using a default dilution-attenuation factor (DAF) of 20 to account for natural processes that reduce contaminant concentrations in the subsurface. Also included are generic SSLs that assume no dilution or attenuation between the source and the receptor well (i.e., a DAF of 1). These values can be used at sites where little or no dilution or attenuation of soil leachate concentrations is expected at a site (e.g., sites with shallow water tables, fractured media, karst topography, or source size greater than 30 acres).

In general, if an SSL is not exceeded for the migration to groundwater pathway, the user may eliminate this pathway from further investigation.

2.4 Miscellaneous

Volatile organic chemicals (VOCs) are indicated by "1" in the VOC column of the table and are defined as those chemicals having a Henry's Law constant greater than 10^{-5} (atm-m^3/mol) and a molecular weight less than 200 g/mole). These contaminants are evaluated for potential volatilization from soil/water to air using volatilization factors (see Section 4.1).

Chemical-specific dermal absorption values for contaminants in soil and dust are presented for arsenic, cadmium, chlordane, 2,4-D, DDT, lindane, TCDD, PAHs, PCBs, and pentachlorophenols as recommended in the Dermal Supplemental Guidance to RAGS (USEPA 1998b). Otherwise, default skin absorption fractions are assumed to be 0.01 and 0.10 for inorganics and organics, respectively.

3.0 USING THE PRG TABLE

The decision to use PRGs at a site will be driven by the potential benefits of having generic risk-based concentrations in the absence of site-specific risk assessments. The original intended use of PRGs was to provide initial cleanup goals for individual chemicals given specific medium and land-use combinations (see RAGS Part B, 1991), however risk-based concentrations have several applications. They can also be used for:

- Setting health-based detection limits for chemicals of potential concern
- Screening sites to determine whether further evaluation is appropriate
- Calculating cumulative risks associated with multiple contaminants

A few basic procedures are recommended for using PRGs properly. These are briefly described below. Potential problems with the use of PRGs are also identified.

3.1 Developing a Conceptual Site Model

The primary condition for use of PRGs is that exposure pathways of concern and conditions at the site match those taken into account by the PRG framework. Thus, it is always necessary to develop a conceptual site model (CSM) to identify likely contaminant source areas, exposure pathways, and potential receptors. This information can be used to determine the applicability of PRGs at the site and the need for additional information. For those pathways not covered by PRGs, a risk assessment specific to these additional pathways may be necessary. Nonetheless, the PRG lookup values will still be useful in such situations for focusing further investigative efforts on the exposure pathways not addressed.

To develop a site-specific CSM, perform an extensive records search and compile existing data (e.g. available site sampling data, historical records, aerial photographs, and hydrogeologic information). Once this information is obtained, CSM worksheets such as those provided in ASTM's *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (1995) can be used to tailor the generic worksheet model to a site-specific CSM. The final CSM

diagram represents linkages among contaminant sources, release mechanisms, exposure pathways and routes and receptors. It summarizes our understanding of the contamination problem.

As a final check, the CSM should answer the following questions:

- Are there potential ecological concerns?
- Is there potential for land use other than those covered by the PRGs (that is, residential and industrial)?
- Are there other likely human exposure pathways that were not considered in development of the PRGs (e.g. impact to groundwater, local fish consumption, raising beef, dairy, or other livestock)?
- Are there unusual site conditions (e.g. large areas of contamination, high fugitive dust levels, potential for indoor air contamination)?

If any of these four conditions exist, the PRG may need to be adjusted to reflect this new information. Suggested references for evaluating pathways not currently evaluated by Region 9 PRG's are presented in Exhibit 3-1.

EXHIBIT 3-1
SUGGESTED READINGS FOR EVALUATING EXPOSURE PATHWAYS NOT CURRENTLY ADDRESSED BY REGION 9 PRGs

EXPOSURE PATHWAY	REFERENCE
Migration of contaminants to an underlying potable aquifer	*Soil Screening Guidance* (USEPA 1996a,b), *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM 1995)
Ingestion via plant uptake	*Soil Screening Guidance* (USEPA 1996a,b)
Ingestion via meat, dairy products, human milk	*Estimating Exposure to Dioxin-Like Compounds* (USEPA 1994a)
Inhalation of volatiles that have migrated into basements	*User's Guide for Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings* (USEPA 1997a)
Ecological pathways	*Ecological Risk Assessment: Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*, (USEPA 1997b), *Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities* (CAL-EPA 1996)

3.2 Background Levels Evaluation

A necessary step in determining the usefulness of Region 9 PRGs is the consideration of background contaminant concentrations. EPA may be concerned with two types of background at sites: naturally occurring and anthropogenic. Natural background is usually limited to metals whereas anthropogenic (i.e. human-made) "background" includes both organic and inorganic contaminants. Before embarking on an extensive sampling and analysis program to determine local background concentrations in the area, one should first compile existing data on the subject. Far too often there is pertinent information in the literature that gets ignored, resulting in needless expenditures of time and money.

Generally EPA does not clean up below natural background. In some cases, the predictive risk-based models generate PRG levels that lie within or even below typical background. If natural background concentrations are higher than the risk-based PRGs, an adjustment of the PRG is probably needed. Exhibit 3-2 presents summary statistics for selected elements in soils that have background levels that may exceed risk-based PRGs. An illustrative example of this is naturally occurring arsenic in soils which frequently is higher than the risk-based PRG set at a one-in-one-million cancer risk (PRG for residential soils is 0.38 mg/kg). After considering background concentrations in a local area, EPA Region 9 has at times used the non-cancer PRG (22 mg/kg) to evaluate sites recognizing that this value tends to be above background levels yet still falls within the range of soil concentrations (0.38-38 mg/kg) that equate to EPA's "permissible" cancer risk range (10E-6 to 10E-4).

Where anthropogenic "background" levels exceed PRGs and EPA has determined that a response action is necessary and feasible, EPA's goal will be to develop a comprehensive response to the widespread contamination. This will often require coordination with different authorities that have jurisdiction over the sources of contamination in the area.

EXHIBIT 3-2
BACKGROUND CONCENTRATIONS OF SELECTED ELEMENTS IN SOILS

TRACE	U.S. STUDY DATA [1]			CALIFORNIA DATA [2]		
ELEMENT	Range	GeoMean	ArMean	Range	GeoMean	ArMean
Arsenic	<.1-97	5.2 mg/kg	7.2 mg/kg	0.59-11	2.75 mg/kg	3.54 mg/kg
Beryllium	<1-15	0.63 "	0.92 "	0.10-2.7	1.14 "	1.28 "
Cadmium	<1-10	--	<1	0.05-1.7	0.26	0.36
Chromium	1-2000	37	54	23-1579	76.25	122.08
Nickel	<5-700	13	19	9.0-509	35.75	56.60

[1]Shacklette and Hansford, "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States",USGS Professional Paper 1270, 1984.

[2]Bradford et. al, "Background Concentrations of Trace and Major Elements in California Soils", Kearney Foundation Special Report, UC-Riverside and CAL-EPA DTSC, March 1996.

3.3 Screening Sites with Multiple Pollutants

A suggested stepwise approach for PRG-screening of sites with multiple pollutants is as follows:

- Perform an extensive records search and compile existing data.

- Identify site contaminants in the PRG Table. Record the PRG concentrations for various media and note whether PRG is based on cancer risk (indicated by "ca") or noncancer hazard (indicated by "nc"). Segregate cancer PRGs from non-cancer PRGs and exclude (but don't eliminate) non-risk based PRGs ("sat" or "max").

- For cancer risk estimates, take the site-specific concentration (maximum or 95 UCL) and divide by the PRG concentrations that are designated for cancer evaluation ("ca"). Multiply this ratio by 10^{-6} to estimate chemical-specific risk for a reasonable maximum exposure (RME). For multiple pollutants, simply add the risk for each chemical:

$$Risk = \left[\left(\frac{conc_x}{PRG_x}\right) + \left(\frac{conc_y}{PRG_y}\right) + \left(\frac{conc_z}{PRG_z}\right)\right] \times 10^{-6}$$

- For non-cancer hazard estimates. Divide the concentration term by its respective non-cancer PRG designated as "nc" and sum the ratios for multiple contaminants. The cumulative ratio represents a non-carcinogenic hazard index (HI). A hazard index of 1 or less is generally considered "safe". A ratio greater than 1 suggests further evaluation. **[Note that carcinogens may also have an associated non-cancer PRG that is not listed in the printed copy of the table sent to folks on the mailing list. To obtain these values, the user should download or view the PRG table at our website and display the appropriate sections.]**

$$Hazard\ Index = \left[\left(\frac{conc_x}{PRG_x}\right) + \left(\frac{conc_y}{PRG_y}\right) + \left(\frac{conc_z}{PRG_z}\right)\right]$$

For more information on screening site risks, the reader should contact EPA Region 9's Technical Support Team.

3. 4 Potential Problems

As with any risk-based tool, the potential exists for misapplication. In most cases the root cause will be a lack of understanding of the intended use of Region 9 PRGs. In order to prevent misuse of PRGs, the following should be avoided:

- Applying PRGs to a site without adequately developing a conceptual site model that identifies relevant exposure pathways and exposure scenarios,
- Not considering background concentrations when choosing PRGs as cleanup goals,
- Use of PRGs as cleanup levels without the nine-criteria analysis specified in the National Contingency Plan (or, comparable analysis for programs outside of Superfund),
- Use of PRGs as cleanup levels without verifying numbers with a toxicologist or regional risk assessor,
- Use of antiquated PRG tables that have been superseded by more recent publications,
- Not considering the effects of additivity when screening multiple chemicals, and
- Adjusting PRGs upward by factors of 10 or 100 without consulting a toxicologist or regional risk assessor.

4.0 TECHNICAL SUPPORT DOCUMENTATION

Region 9 PRGs consider human exposure hazards to chemicals from contact with contaminated soils, air, and water. The emphasis of the PRG equations and technical discussion are aimed at developing initial goals for soils, since this is an area where few standards exist. For air and water, additional reference concentrations or standards are available for many chemicals (e.g. non-zero MCLGs, AWQC, and NAAQS) and consequently the discussion of these media are brief.

4.1 Soil - Direct Ingestion

Calculation of PRGs for direct ingestion of soil is based on the methodology presented in RAGS HHEM, Part B (USEPA 1991a). Briefly, this methodology backcalculates a soil concentration level from a target risk (for carcinogens) or hazard quotient (for noncarcinogens). A number of studies have shown that inadvertent ingestion of soil is common among children for 6 years old and younger (Calabrese et al. 1989, Davis et al. 1990, Van Wijnen et al. 1990). Therefore, the approach uses an age-adjusted soil ingestion factor that takes into account the difference in daily soil ingestion rates, body weights, and exposure duration for children from 1 to 6 years old and others from 7 to 31 years old. The higher intake rate of soil by children and their lower body weights lead to a lower, or more conservative, risk-based concentration compared to an adult-only assumption.

For noncarcinogens, the definition of an RfD has led to debates concerning the comparison of less-than-lifetime estimates of exposure to the RfD. Specifically, it is often asked whether the comparison of a 6-year exposure, estimated for children via soil ingestion, to the chronic RfD is unnecessarily conservative. In their analysis of the issue, the Science Advisory Board (SAB) indicates that, for most chemicals, the approach of combining the higher 6-year exposure for children with chronic toxicity criteria may be overly protective. However, they noted that there are specific instances when the chronic RfD may be based on endpoints of toxicity that are specific to children (e.g. fluoride and nitrates) or when the dose-response is steep (i.e., the dosage difference between the no-observed-adverse-effects level (NOAEL) and an adverse effects level is small). Thus, for the purposes of screening, EPA Region 9 has opted to base the generic PRGs for noncarcinogenic contaminants on the more conservative "childhood only" exposure.

4.2 Soil - Vapor and Particulate Inhalation

Agency toxicity criteria indicate that risks from exposure to some chemicals via inhalation far outweigh the risk via ingestion; therefore soil PRGs have been designed to address this pathway as well. The models used to calculate PRGs for inhalation of volatiles/particulates are updates of risk assessment methods presented in RAGS Part B (USEPA 1991a) and are identical to the *Soil Screening Guidance: User's Guide and Technical Background Document* (USEPA 1996a,b).

To address the soil-to-air pathways the PRG calculations incorporate volatilization factors (VF_s) for volatile contaminants and particulate emission factors (PEF) for nonvolatile contaminants. These factors relate soil contaminant concentrations to air contaminant concentrations that may be inhaled on-site. The VF_s and PEF equations can be broken into two separate models: an emission model to estimate emissions of the contaminant from the soil and a dispersion model to simulate the dispersion of the contaminant in the atmosphere.

It should be noted that the box model in RAGS Part B has been replaced with a dispersion term (Q/C) derived from a modeling exercise using meteorological data from 29 locations across the United States because the box model may not be applicable to a broad range of site types and meteorology and does not utilize state-of-the-art techniques developed for regulatory dispersion modeling. The dispersion model for both volatiles and particulates is the AREA-ST, an updated version of the Office of Air Quality Planning and Standards, Industrial Source Complex Model, ISC2. However, different Q/C terms are used in the VF and PEF equations. Los Angeles was selected as the 90th percentile data set for volatiles and Minneapolis was selected as the 90th percentile data set for fugitive dusts (USEPA 1996 a,b). A default source size of 0.5 acres was chosen for the PRG calculations. This is consistent with the default exposure area over which Region 9 typically averages contaminant concentrations in soils. If unusual site conditions exist such that the area source is substantially larger than the default source size assumed here, an alternative Q/C could be applied (see USEPA 1996a,b).

Volatilization Factor for Soils

Volatile chemicals, defined as those chemicals having a Henry's Law constant greater than 10^{-5} (atm-m^3/mol) and a molecular weight less than 200 g/mole, were screened for inhalation exposures using a volatilization factor for soils (VF_s). Please note that VF_s's are available at our website.

The emission terms used in the VF_s are chemical-specific and were calculated from physical-

chemical information obtained from several sources. The priority of these sources were as follows: *Soil Screening Guidance* (USEPA 1996a,b), *Superfund Chemical Data Matrix* (USEPA 1996c), *Fate and Exposure Data* (Howard 1991), *Subsurface Contamination Reference Guide* (EPA 1990a), and *Superfund Exposure Assessment Manual* (SEAM, EPA 1988). In those cases where Diffusivity Coefficients (Di) were not provided in existing literature, Di's were calculated using Fuller's Method described in SEAM. A surrogate term was required for some chemicals that lacked physico-chemical information. In these cases, a proxy chemical of similar structure was used that may over- or under-estimate the PRG for soils.

Equation 4-9 forms the basis for deriving generic soil PRGs for the inhalation pathway. The following parameters in the standardized equation can be replaced with specific site data to develop a simple site-specific PRG

- Source area
- Average soil moisture content
- Average fraction organic carbon content
- Dry soil bulk density

The basic principle of the VF_s model (Henry's law) is applicable only if the soil contaminant concentration is at or below soil saturation "sat". Above the soil saturation limit, the model cannot predict an accurate VF-based PRG. How these particular cases are handled, depends on whether the contaminant is liquid or solid at ambient soil temperatures (see Section 4.5).

Particulate Emission Factor for Soils

Inhalation of chemicals adsorbed to respirable particles (PM_{10}) were assessed using a default PEF equal to 1.316×10^9 m^3/kg that relates the contaminant concentration in soil with the concentration of respirable particles in the air due to fugitive dust emissions from contaminated soils. The generic PEF was derived using default values in Equation 4-11, which corresponds to a receptor point concentration of approximately 0.76 ug/m^3. The relationship is derived by Cowherd (1985) for a rapid assessment procedure applicable to a typical hazardous waste site where the surface contamination provides a relatively continuous and constant potential for emission over an extended period of time (e.g. years). This represents an annual average emission rate based on wind erosion that should be compared with chronic health criteria; it is not appropriate for evaluating the potential for more acute exposures.

The impact of the PEF on the resultant PRG concentration (that combines soil exposure pathways for ingestion, skin contact, and inhalation) can be assessed by downloading the PRG tables and displaying the hidden columns. Equation 4-11 forms the basis for deriving a generic PEF for the inhalation pathway. For more details regarding specific parameters used in the PEF model, the reader is referred to *Soil Screening Guidance: Technical Background Document* (USEPA 1996a).

Note: the generic PEF evaluates windborne emissions and does not consider dust emissions from traffic or other forms of mechanical disturbance that could lead to greater emissions than assumed here.

4.3 Soil - Dermal Absorption

Much uncertainty surrounds the determination of hazards associated with skin contact with soils. One important data gap is the lack of EPA verified toxicity values for the dermal route. For screening purposes it is assumed that dermal toxicity values can be route-to-route extrapolated from oral values but this may not always be an appropriate assumption and should be checked.

Per RAGS (1989) Appendix A, an adjustment of an oral slope factor/RfD to estimate a dermal toxicity value could be performed if the following conditions are met:

1) The critical study upon which the toxicity value is based employed an administered dose (e.g., delivery in diet or by gavage) in its study design

2) A scientifically defensible data base exists and demonstrates that the gastrointestinal absorption of the chemical in question, from a media (e.g., water, feed) similar to the one employed in the critical study, is significantly less than 100%.

Most often, it is the second condition that precludes the adjustment of oral slope factors/RfDs to estimate dermal toxicity values for a given compound. When the aforementioned criteria is not met, it is recommended that a default value of complete (i.e., 100%) oral absorption be assumed, thereby eliminating the need for oral toxicity value adjustment. It should be noted that employing the oral absorption default value may result in an underestimation of risk; the magnitude of the underestimation being inversely proportional to the true oral absorption of the chemical in question.

Chemical-specific dermal absorption values for contaminants in soil and dust are presented for arsenic, cadmium, chlordane, 2,4-D, DDT, lindane, TCDD, PAHs, PCBs, and pentachlorophenols as recommended in the Supplemental Dermal Guidance to RAGS (USEPA 1998). Otherwise, default skin absorption fractions are assumed to be 0.01 and 0.10 for inorganics and organics, respectively.

Since the 1996 PRG table was issued, default values for dermal contact with soil have changed for two parameters, surface area and soil adherence (see Exhibit 4-1). Exposed surface areas change from 5000 and 2000 to 5700 and 2900 for adults and children, respectively. Recommended adherence factors change from 0.2 mg/cm^2 for both adults and children to age-specific adherence factors of 0.08 and 0.3 mg/cm^2 for adults and children, respectively. The justification for these changes is explained in detail in *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment* (USEPA 1998b) and will not be repeated here.

4.4 Soils - Migration to Groundwater

The methodology for calculating SSLs for the migration to groundwater was developed to identify chemical concentrations in soil that have the potential to contaminate groundwater. Migration of contaminants from soil to groundwater can be envisioned as a two-stage process: (1) release of contaminant in soil leachate and (2) transport of the contaminant through the underlying soil and aquifer to a receptor well. The SSL methodology considers both of these fate and transport mechanisms.

SSLs are backcalculated from acceptable ground water concentrations (i.e. nonzero MCLGs, MCLs, or risk-based PRGs). First, the acceptable groundwater concentration is multiplied by a dilution factor to obtain a target leachate concentration. For example, if the dilution factor is 10 and the acceptable ground water concentration is 0.05 mg/L, the target soil leachate concentration would be 0.5 mg/L. The partition equation (presented in the *Soil Screening Guidance* document) is then used to calculate the total soil concentration (i.e. SSL) corresponding to this soil leachate concentration.

The SSL methodology was designed for use during the early stages of a site evaluation when information about subsurface conditions may be limited. Because of this constraint, the methodology is based on conservative, simplifying assumptions about the release and transport of contaminants in the subsurface. For more on SSLs, and how to calculate site-specific SSLs versus generic SSLs presented in the PRG table, the reader is referred to the *Soil Screening Guidance* document (USEPA 1996a,b).

4.5 Soil Saturation Limit

The soil saturation concentration "sat" corresponds to the contaminant concentration in soil at which the absorptive limits of the soil particles, the solubility limits of the soil pore water, and saturation of soil pore air have been reached. Above this concentration, the soil contaminant may be present in free phase, i.e., nonaqueous phase liquids (NAPLs) for contaminants that are liquid at ambient soil temperatures and pure solid phases for compounds that are solid at ambient soil temperatures.

Equation 4-10 is used to calculate "sat" for each volatile contaminant. As an update to RAGS HHEM, Part B (USEPA 1991a), this equation takes into account the amount of contaminant that is in the vapor phase in soil in addition to the amount dissolved in the soil's pore water and sorbed to soil particles.

Chemical-specific "sat" concentrations must be compared with each VF-based PRG because a basic principle of the PRG volatilization model is not applicable when free-phase contaminants are present. How these cases are handled depends on whether the contaminant is liquid or solid at ambient temperatures. Liquid contaminant that have a VF-based PRG that exceeds the "sat" concentration are set equal to "sat" whereas for solids (e.g., PAHs), soil screening decisions are based on the appropriate PRGs for other pathways of concern at the site (e.g., ingestion and dermal contact).

4.6 Ground Water/Surface Water - Ingestion and Inhalation

Calculation of PRGs for ingestion and inhalation of contaminants in domestic water is based on the methodology presented in RAGS HHEM, Part B (USEPA 1991a). Ingestion of drinking water is an appropriate pathway for all chemicals. For the purposes of this guidance, however, inhalation of volatile chemicals from water is considered routinely only for chemicals with a Henry's Law constant of 1×10^{-5} atm-m^3/mole or greater and with a molecular weight of less than 200 g/mole.

For volatile chemicals, an upperbound volatilization constant (VF_w) is used that is based on all uses of household water (e.g showering, laundering, and dish washing). Certain assumptions were made. For example, it is assumed that the volume of water used in a residence for a family

of four is 720 L/day, the volume of the dwelling is 150,000 L and the air exchange rate is 0.25 air changes/hour (Andelman in RAGS Part B). Furthermore, it is assumed that the average transfer efficiency weighted by water use is 50 percent (i.e. half of the concentration of each chemical in water will be transferred into air by all water uses). Note: the range of transfer efficiencies extends from 30% for toilets to 90% for dishwashers.

4.7 Default Exposure Factors

Default exposure factors were obtained primarily from RAGS Supplemental Guidance Standard Default *Exposure Factors* (OSWER Directive, 9285.6-03) dated March 25, 1991 and more recent information from U.S. EPA's Office of Solid Waste and Emergency Response, U.S. EPA's Office of Research and Development, and California EPA's Department of Toxic Substances Control (see Exhibit 4-1).

Because contact rates may be different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors ("adj"). Use of age-adjusted factors are especially important for soil ingestion exposures, which are higher during childhood and decrease with age. However, for purposes of combining exposures across pathways, additional age-adjusted factors are used for inhalation and dermal exposures. These factors approximate the integrated exposure from birth until age 30 combining contact rates, body weights, and exposure durations for two age groups - small children and adults. Age-adjusted factors were obtained from RAGS PART B or developed by analogy (see derivations next page).

For soils only, noncarcinogenic contaminants are evaluated in children separately from adults. No age-adjustment factor is used in this case. The focus on children is considered protective of the higher daily intake rates of soil by children and their lower body weight. For maintaining consistency when evaluating soils, dermal and inhalation exposures are also based on childhood contact rates.

(1) ingestion([mg-yr]/[kg-d]:

$$IFS_{adj} = \frac{ED_c \times IRS_c}{BW_c} + \frac{(ED_t - ED_c) \times IRS_a}{BW_a}$$

(2) skin contact([mg-yr]/[kg-d]:

$$SFS_{adj} = \frac{ED_c \times AF \times SA_c}{BW_c} + \frac{(ED_t - ED_c) \times AF \times SA_a}{BW_a}$$

(3) inhalation ([m^3-yr]/[kg-d]):

$$InhF_{adj} = \frac{ED_c \times IRA_c}{BW_c} + \frac{(ED_t - ED_c) \times IRA_a}{BW_a}$$

EXHIBIT 4-1
STANDARD DEFAULT FACTORS

Symbol	Definition (units)	Default	Reference
CSFo	Cancer slope factor oral (mg/kg-d)-1	--	IRIS, HEAST, or NCEA
CSFi	Cancer slope factor inhaled (mg/kg-d)-1	--	IRIS, HEAST, or NCEA
RfDo	Reference dose oral (mg/kg-d)	--	IRIS, HEAST, or NCEA
RfDi	Reference dose inhaled (mg/kg-d)	--	IRIS, HEAST, or NCEA
TR	Target cancer risk	10^{-6}	--
THQ	Target hazard quotient	1	--
BWa	Body weight, adult (kg)	70	RAGS (Part A), EPA 1989 (EPA/540/1-89/002)
BWc	Body weight, child (kg)	15	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
ATc	Averaging time - carcinogens (days)	25550	RAGS(Part A), EPA 1989 (EPA/540/1-89/002)
ATn	Averaging time - noncarcinogens (days)	ED*365	
SAa	Exposed surface area, adult (cm^2/day)	5700	Dermal Assessment, EPA 1998 (NCEA-W-0364)
SAc	Exposed surface area, child (cm^2/day)	2900	Dermal Assessment, EPA 1998 (NCEA-W-0364)
AFa	Adherence factor, adult (mg/cm^2)	0.08	Dermal Assessment, EPA 1998 (NCEA-W-0364)
AFc	Adherence factor, child (mg/cm^2)	0.3	Dermal Assessment, EPA 1998 (NCEA-W-0364)
ABS	Skin absorption (unitless):		
	-- organics	0.1	Dermal Assessment, EPA 1998 (NCEA-W-0364)
	--Inorganics	0.01	Dermal Assessment, EPA 1998 (NCEA-W-0364)
IRAa	Inhalation rate - adult (m^3/day)	20	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
IRAc	Inhalation rate - child (m^3/day)	10	Exposure Factors, EPA 1997 (EPA/600/P-95/002Fa)
IRWa	Drinking water ingestion - adult (L/day	2	RAGS(Part A), EPA 1989 (EPA/540/1-89/002)
IRWc	Drinking water ingestion - child (L/day)	1	PEA, Cal-EPA (DTSC, 1994)
IRSa	Soil ingestion - adult (mg/day)	100	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
IRSc	Soil ingestion - child (mg/day),	200	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
IRSo	Soil ingestion - occupational (mg/day)	50	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EFr	Exposure frequency - residential (d/y)	350	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EFo	Exposure frequency - occupational (d/y)	250	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EDr	Exposure duration - residential (years)	30*	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EDc	Exposure duration - child (years)	6	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EDo	Exposure duration - occupational (years)	25	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
	Age-adjusted factors for carcinogens:		
IFSadj	Ingestion factor, soils ([mg-yr]/[kg-d])	114	RAGS(Part B), EPA 1991 (OSWER No. 9285.7-01B)
SFSadj	Skin contact factor, soils ([mg-yr]/[kg-d])	504	By analogy to RAGS (Part B)
InhFadj	Inhalation factor ([m^3-yr]/[kg-d])	11	By analogy to RAGS (Part B)
IFWadj	Ingestion factor, water ([l-yr]/[kg-d])	1.1	By analogy to RAGS (Part B)
VFw	Volatilization factor for water (L/m^3)	0.5	RAGS(Part B), EPA 1991 (OSWER No. 9285.7-01B)
PEF	Particulate emission factor (m^3/kg)	See below	Soil Screening Guidance (EPA 1996a,b)
VFs	Volatilization factor for soil (m^3/kg)	See below	Soil Screening Guidance (EPA 1996a,b)
sat	Soil saturation concentration (mg/kg)	See below	Soil Screening Guidance (EPA 1996a,b)

Footnote:
*Exposure duration for lifetime residents is assumed to be 30 years total. For carcinogens, exposures are combined for children (6 years) and adults (24 years)

4.8 Standardized Equations

The equations used to calculate the PRGs for carcinogenic and noncarcinogenic contaminants are presented in Equations 4-1 through 4-8. The PRG equations update RAGS Part B equations. The methodology backcalculates a soil, air, or water concentration level from a target risk (for carcinogens) or hazard quotient (for noncarcinogens). For completeness, the soil equations combine risks from ingestion, skin contact, and inhalation simultaneously. Note: the electronic version of the table also includes pathway-specific PRGs, should the user decide against combining specific exposure pathways; or, the user wants to identify the relative contribution of each pathway to exposure.

To calculate PRGs for volatile chemicals in soil, a chemical-specific volatilization factor is calculated per Equation 4-9. Because of its reliance on Henry's law, the VF_s model is applicable only when the contaminant concentration in soil is at or below saturation (i.e. there is no free-phase contaminant present). Soil saturation ("sat") corresponds to the contaminant concentration in soil at which the adsorptive limits of the soil particles and the solubility limits of the available soil moisture have been reached. Above this point, pure liquid-phase contaminant is expected in the soil. If the PRG calculated using VF_s was greater than the calculated sat, the PRG was set equal to sat, in accordance with *Soil Screening Guidance* (USEPA 1996 a,b). The equation for deriving sat is presented in Equation 4-10.

PRG EQUATIONS

Soil Equations: For soils, equations were based on three exposure routes (ingestion, skin contact, and inhalation).

Equation 4-1: Combined Exposures to Carcinogenic Contaminants in Residential Soil

$$C(mg/kg) = \frac{TR \times AT_c}{EF_r \left[\left(\frac{IFS_{adj} \times CSF_o}{10^6 mg/kg} \right) + \left(\frac{SFS_{adj} \times ABS \times CSF_o}{10^6 mg/kg} \right) + \left(\frac{InhF_{adj} \times CSF_i}{VF_s^a} \right) \right]}$$

Equation 4-2: Combined Exposures to Noncarcinogenic Contaminants in Residential Soil

$$C(mg/kg) = \frac{THQ \times BW_c \times AT_n}{EF_r \times ED_c \left[\left(\frac{1}{RfD_o} \times \frac{IRS_c}{10^6 mg/kg} \right) + \left(\frac{1}{RfD_n} \times \frac{SA_c \times AF \times ABS}{10^6 mg/kg} \right) + \left(\frac{1}{RfD_i} \times \frac{IRA_c}{VF_s^a} \right) \right]}$$

Equation 4-3: Combined Exposures to Carcinogenic Contaminants in Industrial Soil

$$C(mg/kg) = \frac{TR \times BW_a \times AT_c}{EF_o \times ED_o \left[\left(\frac{IRS_a \times CSF_o}{10^6 mg/kg} \right) + \left(\frac{SA_a \times AF \times ABS \times CSF_o}{10^6 mg/kg} \right) + \left(\frac{IRA_a \times CSF_i}{VF_s^a} \right) \right]}$$

Footnote:
[a]Use VF_s for volatile chemicals (defined as having a Henry's Law Constant [atm-m^3/mol] greater than 10^{-5} and a molecular weight less than 200 grams/mol) or PEF for non-volatile chemicals.

Equation 4-4: Combined Exposures to Noncarcinogenic Contaminants in Industrial Soil

$$C(mg/kg) = \frac{THQ \times BW_a \times AT_n}{EF_n \times ED_o \left[\left(\frac{1}{RfD_o} \times \frac{IRS_n}{10^6 mg/kg} \right) + \left(\frac{1}{RfD_o} \times \frac{SA_n \times AF \times ABS}{10^6 mg/kg} \right) + \left(\frac{1}{RfD_i} \times \frac{IRA_a}{VF_s^a} \right) \right]}$$

Tap Water Equations:

Equation 4-5: Ingestion and Inhalation Exposures to Carcinogenic Contaminants in Water

$$C(ug/L) = \frac{TR \times AT_c \times 1000 ug/mg}{EF_r \left[(IFW_{adj} \times CSF_o) + (VF_w \times InhF_{adj} \times CSF_i) \right]}$$

Equation 4-6: Ingestion and Inhalation Exposures to Noncarcinogenic Contaminants in Water

$$C(ug/L) = \frac{THQ \times BW_a \times AT_n \times 1000 ug/mg}{EF_i \times ED_i \left[\left(\frac{IRW_a}{RfD_o} \right) + \left(\frac{VF_w \times IRA_a}{RfD_i} \right) \right]}$$

Air Equations:

Equation 4-7: Inhalation Exposures to Carcinogenic Contaminants in Air

$$C(ug/m^3) = \frac{TR \times AT_c \times 1000 ug/mg}{EF_r \times InhF_{adj} \times CSF_i}$$

Equation 4-8: Inhalation Exposures to Noncarcinogenic Contaminants in Air

$$C(ug/m^3) = \frac{THQ \times RfD_i \times BW_a \times AT_n \times 1000 ug/mg}{EF_r \times ED_r \times IRA_a}$$

Footnote:

[a]Use VF_s for volatile chemicals (defined as having a Henry's Law Constant [atm-m^3/mol] greater than 10^{-5} and a molecular weight less than 200 grams/mol) or PEF for non-volatile chemicals.

SOIL-TO-AIR VOLATILIZATION FACTOR (VF_s)

Equation 4-9: Derivation of the Volatilization Factor

$$VF_s\,(m^3/kg) = (Q/C) \times \frac{(3.14 \times D_A \times T)^{1/2}}{(2 \times \rho_b \times D_A)} \times 10^{-4}\,(m^2/cm^2)$$

where:

$$D_A = \frac{[(\Theta_a^{10/3} D_i H' + \Theta_w^{10/3} D_w)/n^2]}{\rho_B K_d + \Theta_w + \Theta_a H'}$$

Parameter	Definition (units)	Default
VF_s	Volatilization factor (m^3/kg)	--
D_A	Apparent diffusivity (cm^2/s)	--
Q/C	Inverse of the mean conc. at the center of a 0.5-acre square source (g/m^2-s per kg/m^3)	68.81
T	Exposure interval (s)	9.5×10^8
ρ_b	Dry soil bulk density (g/cm^3)	1.5
Θ_a	Air filled soil porosity (L_{air}/L_{soil})	0.28 or n-Θ_w
n	Total soil porosity (L_{pore}/L_{soil})	0.43 or 1 - (ρ_b/ρ_s)
Θ_w	Water-filled soil porosity (L_{water}/L_{soil})	0.15
ρ_s	Soil particle density (g/cm^3)	2.65
Di	Diffusivity in air (cm^2/s)	Chemical-specific
H	Henry's Law constant ($atm\text{-}m^3/mol$)	Chemical-specific
H'	Dimensionless Henry's Law constant	Calculated from H by multiplying by 41 (USEPA 1991a)
D_w	Diffusivity in water (cm^2/s)	Chemical-specific
K_d	Soil-water partition coefficient (cm^3/g) = $K_{oc} f_{oc}$	Chemical-specific
K_{oc}	Soil organic carbon-water partition coefficient (cm^3/g)	Chemical-specific
f_{oc}	Fraction organic carbon in soil (g/g)	0.006 (0.6%)

SOIL SATURATION CONCENTRATION (sat)

Equation 4-10: Derivation of the Soil Saturation Limit

$$sat = \frac{S}{\rho_b}\left(K_d \rho_b + \Theta_w + H'\Theta_a\right)$$

Parameter	Definition (units)	Default
sat	Soil saturation concentration (mg/kg)	--
S	Solubility in water (mg/L-water)	Chemical-specific
ρ_b	Dry soil bulk density (kg/L)	1.5
n	Total soil porosity (L_{pore}/L_{soil})	0.43 or 1 - (ρ_b/ρ_s)
ρ_s	Soil particle density (kg/L)	2.65
K_d	Soil-water partition coefficient (L/kg)	K_{oc} x f_{oc} (chemical-specific)
k_{oc}	Soil organic carbon/water partition coefficient (L/kg)	Chemical-specific
f_{oc}	Fraction organic carbon content of soil (g/g)	0.006 or site-specific
Θ_w	Water-filled soil porosity (L_{water}/L_{soil})	0.15
Θ_a	Air filled soil porosity (L_{air}/L_{soil})	0.28 or n-Θ_w
w	Average soil moisture content (kg_{water}/kg_{soil} or L_{water}/kg_{soil})	0.1
H	Henry's Law constant (atm-m^3/mol)	Chemical-specific
H'	Dimensionless Henry's Law constant	H x 41, where 41 is a units conversion factor

SOIL-TO-AIR PARTICULATE EMISSION FACTOR (PEF)

Equation 4-11: Derivation of the Particulate Emission Factor

$$PEF(m^3/kg) = Q/C \times \frac{3600 s/h}{0.036 \times (1-V) \times (U_m/U_t)^3 \times F(x)}$$

Parameter	Definition (units)	Default
PEF	Particulate emission factor (m^3/kg)	1.316×10^9
Q/C	Inverse of the mean concentration at the center of a 0.5-acre-square source (g/m^2-s per kg/m^3)	90.80
V	Fraction of vegetative cover (unitless)	0.5
U_m	Mean annual windspeed (m/s)	4.69
U_t	Equivalent threshold value of windspeed at 7 m (m/s)	11.32
F(x)	Function dependent on U_m/U_t derived using Cowherd (1985) (unitless)	0.194

REFERENCES

ASTM. 1995. *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites*. Designation E 1739 - 95. Philadelphia, Pennsylvania.

Calabrese, E.J., H. Pastides, R. Barnes, et al. 1989. How much soil do young children ingest: an epidemiologic study. In: *Petroleum Contaminated Soils*, Vol. 2. E.J. Calabrese and P.T. Kostecki, eds. pp. 363-417. Chelsea, MI, Lewis Publishers.

California EPA. 1994. *Preliminary Endangerment Assessment Guidance Manual*. Department of Toxic Substances Control, Sacramento, California.

California EPA. 1996. *Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities, Part A: Overview*. Department of Toxic Substances Control, Sacramento, California.

Cowherd, C., G. Muleski, P. Engelhart, and D. Gillette. 1985. *Rapid Assessment of Exposure to Particulate Emission from Surface Contamination*. EPA/600/8-85/002. Prepared for Office of Health and Environmental Assessment, U.S. Environmental Protection Agency, Washington, DC. NTIS PB85-1922197AS.

Davis, S., P. Waller, R. Buschom, J. Ballou, and P. White. 1990. Quantitative estimates of soil ingestion in normal children between the ages of 2 and 7 years: population-based estimates using Al, Si, and Ti as soil tracer elements. *Archives of Environmental Health* 45:112-122.

Howard, P.H. 1990. *Handbook of Environmental Fate and Exposure Data for Organic Chemicals*. Lewis Publishers, Chelsea Michigan.

U.S. EPA. 1988. *Superfund Exposure Assessment Manual*. EPA/540/1-88/001. Office of Emergency and Remedial Response, Washington, DC.

U.S. EPA. 1990a. *Subsurface Contamination Reference Guide*. EPA/540/2-90/011. Office of Emergency and Remedial Response, Washington, DC.

U.S. EPA 1990b. *Exposure Factors Handbook*. EPA/600/8089/043. Office of Health and Environmental Assessment, Washington, DC.

U.S. EPA. 1991a. *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals)*. Publication 9285.7-01B. Office of Emergency and Remedial Response, Washington, DC. NTIS PB92-963333.

U.S. EPA. 1991b. *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors*. Publication 9285.6-03. Office of Emergency and Remedial Response, Washington, DC. NTIS PB91-921314.

U.S. EPA. 1992a *Technical Support Document for Land Application of Sewage Sludge; Volumes I and II*. Office of Water, Washington, DC. 822/R-93-001a,b.

U.S. EPA. 1992b *Dermal Exposure Assessment: Principles and Applications*. EPA/600/8-91/011B. Office of Health and Environmental Assessment, Washington, DC.

U.S. EPA 1994a. *Estimating Exposure to Dioxin-Like Compounds*. U.S. EPA Office of Research and Development, EPA/600/6-88/005B.

U.S. EPA 1994b. *Role of Ecological Assessment in the Baseline Risk Assessment*. OSWER Directive No. 9285.7-17. Office of Solid Waste and Emergency Response, Washington, DC.

U.S. EPA. 1996a. *Soil Screening Guidance: Technical Background Document*. EPA/540/R-95/128. Office of Emergency and Remedial Response, Washington, DC. PB96-963502.

U.S. EPA. 1996b. *Soil Screening Guidance: User's Guide*. EPA/540/R-96/018. Office of Emergency and Remedial Response, Washington, DC. PB96-963505.

U.S. EPA 1996c. *Superfund Chemical Data Matrix*. EPA/540/R-96/028. Office of Solid Waste and Emergency Response, Washington, DC. PB94-963506.

U.S. EPA. 1997a. *Health Effects Assessment Summary Tables* (HEAST): Annual Update, FY 1997. National Center For Environmental Assessment (NCEA), Office of Research and Development and Office of Emergency and Remedial Response, Washington, DC.

U.S. EPA. 1997b. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final*. EPA/540/R-97/006. Office of Solid Waste and Emergency Response, Washington, DC. PB97-963211.

U.S. EPA. 1998a. *Integrated Risk Information System* (IRIS). Duluth, MN.

U.S. EPA. 1998b. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance Dermal Risk Assessment, Interim Guidance. NCEA-W-0364. Office of Emergency and Remedial Response, Washington, D.C.

Van Wijnen, J.H., P. Clausing and B. Brunekreef. 1990. Estimated soil ingestion by children. *Environmental Research*, 51:147-162.

APPENDIX K

QUALITY CONTROL SUMMARY REPORT

(124 Pages)

APPENDIX K

QUALITY CONTROL SUMMARY REPORT

CONTENTS

Section			Page
ABBREVIATIONS AND ACRONYMS			iii
1.0	INTRODUCTION		1
2.0	VALIDATION METHODOLOGY		1
3.0	CURSORY REVIEW		3
	3.1	HOLDING TIMES	4
	3.2	CALIBRATION	5
		3.2.1 Organic Analyses	5
		3.2.2 Inorganic Analyses	6
	3.3	LABORATORY AND FIELD BLANKS	6
	3.4	ACCURACY	9
	3.5	PRECISION: FIELD AND LABORATORY	10
	3.6	ANALYTICAL/MATRIX PERFORMANCE	11
	3.7	RESULTS BELOW THE CRQL	13
4.0	FULL REVIEW		13
	4.1	ADDITIONAL ANALYTICAL AND MATRIX PERFORMANCE	14
	4.2	ANALYTE IDENTIFICATION	15
	4.3	ANALYTE QUANTITATION	17
	4.4	ANALYTE REPORTING LIMITS	17
5.0	PARCC EVALUATION SUMMARY		17
	5.1	ACCURACY	18
	5.2	PRECISION	18
	5.3	COMPLETENESS	19
	5.4	COMPARABILITY	19
	5.5	REPRESENTATIVENESS	20
6.0	CONCLUSIONS FOR DATA QUALITY AND DATA USABILITY		20
REFERENCES			119

APPENDIX K

QUALITY CONTROL SUMMARY REPORT

TABLES

Tables		Page
K-1	ANALYTICAL METHODS, SAMPLE HOLDING TIMES, CONTAINERS, AND PRESERVATION	K-22
K-2	HOLDING TIME REQUIREMENTS	K-29
K-3	DATA QUALIFICATION: HOLDING TIME EXCEEDANCES	K-32
K-4	CALIBRATION REQUIREMENTS	K-42
K-5	DATA QUALIFICATION: ORGANIC CALIBRATION EXCEEDANCES	K-45
K-6	EQUIPMENT BLANK SUMMARY	K-47
K-7	DATA QUALIFICATION: BLANK CONTAMINATION	K-48
K-8	ACCURACY REQUIREMENTS	K-53
K-9	DATA QUALIFICATION: BLANK CONTAMINATION	K-56
K-10	ACCURACY REQUIREMENTS	K-67
K-11	FIELD DUPLICATE SUMMARY	K-69
K-12	ANALYTICALA ND MATRIX PERFORMANCE REQUIREMENTS FOR ORGANIC ANALYSIS	K-86
K-13	ANALYTICAL AND MATRIX PERFORMANCE REQUIREMENTS FOR INORGANIC ANALYSIS	K-79
K-14	DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCEK-94S	K-80
K-15	DATA QUALIFICATION: RESULTS REPORTED BELOW THE CRQL	K-90
K-16	DATA EVALUATION: REPORTING LIMITS	K-94

APPENDIX K

QUALITY CONTROL SUMMARY REPORT

ABBREVIATIONS AND ACRONYMS

APHA	American Public Health Association
ASTM	American Society of Testing and Materials
BFB	Bromofluorobenzene
CCV	Continuing calibration verification
CLP	Contract Laboratory Program
CFR	Code of Federal Regulations
CRDL	Contract required detection limit
CRQL	Contract required quantitation limit
%D	Percent difference
DFTPP	Decafluorotriphenylphosphine
ECD	Electron capture detector
EPA	U.S. Environmental Protection Agency
FSAP	Field sampling and analysis plan
GC/MS	Gas chromatography/mass spectrometry
GFAA	Graphite furnace atomic absorption
GPC	Gel-permeation chromatography
ICPES	Inductively coupled plasma emission spectrophotometer
ICV	Initial calibration verification
IDL	Instrument detection limit
LCS	Laboratory control sample
LUFT	Leaking Underground Fuel Tank
MCAWW	Methods for Chemical Analysis of Water and Wastes
MS/MSD	Matrix spike/matrix spike duplicate
MSA	Method of standard addition
NIST	National Institute of Standards and Technology
NWS	Weapons Station
PARCC	Precision, accuracy, representativeness, completeness, and comparability

ABBREVIATIONS AND ACRONYMS (Continued)

PCB	Polychlorinated biphenyl
PRC	PRC Environmental Management, Inc.
QA/QC	Quality assurance and quality control
QAPjP	Quality assurance project plan
QCSR	Quality control summary report
%R	Percent recovery
RAGS	Risk Assessment Guidance for Superfund
RI	Remedial investigation
RPD	Relative percent difference
RRF	Relative response factor
RRT	Relative retention time
%RSD	Percent relative standard deviation
SDG	Sample delivery group
SMEWW	Standard Methods for the Evaluation of Water and Wastewater
TIC	Tentatively identified compound
TOC	Total organic carbon
TPH	Total petroleum hydrocarbons
WET	Waste extraction test
±	Plus or minus

1.0 INTRODUCTION

This data quality control summary report (QCSR) presents results of the chemical and quality control data gathered during the remedial investigation (RI) field effort for the tidal area sites at Naval Weapons Station (NWS) Concord. Field activities were conducted from January 18, 1993 through October 26, 1995. Sites in the Tidal Area include Site 1: Tidal Area Landfill, Site 2: R Area Disposal Site, Site 9: Froid and Taylor Roads, and Site 11: Wood Hogger Site. This report consists of five sections. Section 2.0 provides an overview of the data validation process. Sections 3.0 and 4.0 present the data validation methodology and the validated results for cursory and full review, respectively. Section 5.0 summarizes the precision, accuracy, representativeness, completeness, and comparability (PARCC) evaluation, and Section 6.0 presents conclusions regarding the overall evaluation of the chemical data.

2.0 VALIDATION METHODOLOGY

Data validation is a systematic process for reviewing and qualifying data against a set of criteria to ensure that the chemical data are adequate for their intended use. Validation is accomplished by reviewing and evaluating all analytical data for precision, accuracy, representativeness, completeness, and comparability (PARCC). The laboratory analytical data generated during the NWS Concord RI were validated according to procedures outlined in the Contract Laboratory Program (CLP), "National Functional Guidelines for Organic Data Review" (EPA 1990a); CLP "National Functional Guidelines for Inorganic Data Review" (EPA 1994); the NWS Concord RI quality assurance project plan (QAPjP) draft final (PRC Environmental Management, Inc. [PRC] October 1994); and the associated analytical methods.

Data validation occurred in two stages: (1) a cursory review of the analytical reports and the quality assurance and quality control (QA/QC) information for 100 percent of the chemical data and (2) a full review of the analytical reports, the QA/QC information, and the associated raw data for 10 percent of the chemical data. The cursory review evaluated the effect the most critical QA/QC information had on the data, such as holding times, calibration requirements, and spiking accuracy. The full review evaluated additional QA/QC criteria and used the raw data to check calculations and analyte

identifications. At each stage of validation, qualifiers were assigned to the results according to U.S. Environmental Protection Agency (EPA) guidelines, procedures outlined in the QAPjP, and associated analytical methods.

The overall objective of data validation was to ensure that the quality of the chemical data set was adequate for its intended purpose, as defined by the PARCC parameters. The PARCC parameters are defined in the EPA document "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, Draft Supplement" (EPA 1986). PARCC parameters were assessed by completing the following tasks:

- Reviewing precision and accuracy of laboratory QC data
- Reviewing precision and accuracy of field QC data
- Reviewing overall analytical process; including holding times, calibrations, analytical
- or matrix performance, and analyte identification and quantitation
- Assigning qualifiers to data affected by QA/QC exceedances
- Reviewing and summarizing implications of the frequency and severity of qualifiers in the validated data

Between January 18, 1993 and October 26, 1995, a total of 503 samples were collected and analyzed as part of the off-site analytical program. The 503 samples included of the following matrices: soil (351 original soil samples and 1 duplicate soil sample), sediment (8), and water (143). Of the 143 water samples, 75 were collected from surface water (67 original samples and 8 duplicate samples); 12 were from wells (11 original samples and 1 duplicate sample); and 56 were field QA/QC samples (28 trip blanks, 27 equipment blanks, and 1 field blank). The tables which follow the text summarize data for 475 samples which were qualified with numerical comment codes. Analyses were conducted in accordance with the EPA CLP (1990a, 1994) and SW-846 (EPA 1992) methods, unless otherwise noted.

- CLP volatiles (VOA)
- CLP semivolatiles (SVOA)
- Low-level CLP semivolatiles (SVOA)

- CLP pesticides/polychlorinated biphenyls (PCB)
- Low-level CLP pesticides/polychlorinated biphenyls (PCB)
- CLP metals
- Total petroleum hydrocarbons (TPH)-purgeables (Appendix D of the State of California Leaking Underground Fuel Tank [LUFT] Field Manual [LUFT Task Force 1989] and EPA Method 5030/8015)
- TPH-extractables (LUFT Field Manual and EPA Method 8015)
- Aromatic volatiles (EPA Method 5030/8020)
- Dioxins (EPA Method 8280)
- Explosives (EPA Method 8330)
- Hexavalent chromium (EPA Method 7196)
- Total organic carbon (TOC) (Standard Methods for the Evaluation of Water and Wastewater [SMEWW] Method 5310B) (American Public Health Association [APHA] 1992)
- pH (EPA Method 9040/9045)
- Sulfides (MCAWW Method 376.1)
- Total suspended solids (MCAWW Method 160.1)
- Modified waste extraction test (WET) for CLP metals (State of California 1990)

The analytical methods and references, as well as sample holding times, containers, and preservation, are listed in Table K-1, which follows Section 6.0 of this QCSR.

3.0 CURSORY REVIEW

Cursory review of the analytical reports for CLP organic, CLP inorganic, and non-CLP methods included the evaluation of the following parameters, as applicable: holding times, initial and continuing calibrations, field and laboratory blank results, laboratory control sample (LCS) or blank spike results, matrix spike/matrix spike duplicate (MS/MSD) results, field and laboratory matrix duplicate results, surrogate recoveries, internal standard performance, inductively coupled plasma emission spectrophotometer (ICPES) serial dilutions, and overall assessment of the data. Cursory review

components and the results of each specific review are detailed below in Sections 3.1 through 3.6. Section 3.7 discusses results that were reported below the contract required quantitation limit (CRQL). Tables K-1 through K-13 summarize the data validation findings and are included following Section 6.0 of this QCSR. Only analytes with qualified data are included in the tables.

3.1 HOLDING TIMES

One objective of data validation was to assess the validity of the chemical data set based on compliance with technical holding times. Technical holding times were defined as the maximum time allowable between sample collection and, as applicable, sample extraction, preparation, and analysis. The Clean Water Act of 1984 (40 Code of Federal Regulations [CFR] 136) established technical requirements for water holding times and preservation (Federal Register 1984). EPA has not yet established technical holding times for soils (and other nonaqueous matrices) (EPA 1990a). For methods not covered by 40 CFR 136, the holding times used for validation purposes were either recommended in the specific analytical methods, such as those for the CLP, or were criteria specified in the QAPjP. Table K-2 summarizes all applicable technical holding time requirements by analysis and matrix, and it includes criteria for estimating and rejecting analytical results when holding times are exceeded.

For analytical methods with required holding times greater than 1 week, samples extracted, prepared, or analyzed outside of specified holding times were qualified as "J3," indicating that the results were estimated values (EPA 1990a, 1994). In cases where these holding times were grossly exceeded (more than two times the specified holding time), nondetected results were qualified as "R3," indicating that the results were rejected, while detected results were qualified as estimated (J3). For analytical methods with required holding times less than 1 week, samples extracted, prepared, or analyzed outside of specified holding times were again qualified as estimated (J3). In cases where these holding times were exceeded by more than 1 week (usually more than two times the specified holding time), nondetected results were rejected (R3), and detected results were estimated (J3). Table K-3 summarizes the Tida Area Sites analytical data that were qualified due to holding time exceedances (J3 and R3). The table shows that most samples were analyzed within holding times. About 0.87 percent of all tidal area sites analytical data was qualified as estimated due to holding time exceedances, while no samples were qualified as rejected due to holding time exceedances. This low frequency of holding time violations contributes to the high technical quality of the tidal area sites data.

3.2 CALIBRATION

Laboratory instrument calibration requirements were established to ensure that the analytical instruments could produce acceptable qualitative and quantitative data for target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an analytical run. Continuing calibration demonstrates that the instrument is capable of repeating the performance established in the initial calibration (EPA 1990a). Table K-4 summarizes all applicable calibration requirements by analysis and includes criteria for estimating and rejecting analytical results when calibration requirements are violated.

3.2.1 Organic Analyses

The initial calibration review for organic analyses included evaluating criteria for percent relative standard deviation (%RSD), relative response factors (RRF), and retention times. The %RSD indicates the analytical system's linearity over an established concentration range. RRF identifies the sensitivity of the analytical system to a particular target analyte. Retention time reflects the analytical system's stability. Retention time stability is particularly important in analyses for CLP pesticides/PCBs, low-level CLP pesticides/PCBs, aromatic volatiles, and explosives. For these analyses, a compound is positively identified when a peak falls within the specified retention time "windows" on two dissimilar columns. Continuing calibration review included evaluating percent difference (%D), RRFs, and retention times. The %D measures the analytical system's precision and was calculated by comparing the daily RRF to the RRF established in the initial calibration.

Samples analyzed when calibration requirements were not met were qualified as "J6," indicating that the results were estimated (EPA 1990a). For samples analyzed when RRF requirements were not met, nondetected results were qualified as "R6," indicating that the results were rejected; detected results were estimated (J6) (EPA 1990a). Table K-5 summarizes tidal area sites organic analytical data that were qualified due to calibration violations (J6 and R6). Of all tidal area sites organic analytical data, only 0.71 percent of the data was qualified as estimated due to calibration violations, and only 0.1 percent was qualified as rejected due to calibration violations. This low frequency of organic calibration violations contributes to the high technical quality of the tidal area sites data.

3.2.2 Inorganic Analyses

The initial calibration review for inorganic analyses included evaluating criteria for the curve's correlation coefficient (r) and initial calibration verification (ICV) percent recoveries (%R). The calibration correlation coefficient indicates the analytical system's linearity over an established range. ICV %R verifies that the analytical system is within established calibration criteria at the beginning of an analytical run. Most metal analytes are analyzed using an ICPES, which is inherently linear over a wide concentration range; as a result, it does not require multiple initial calibration standards, which are mandatory for most other methods. The continuing calibration review included evaluating the criteria for continuing calibration verification (CCV) %R. The CCV %R verifies that the analytical system is within the established calibration throughout the analytical run.

Samples analyzed when the calibration requirements were not met were qualified as "J6," indicating that the results were estimated (EPA 1994). Of all tidal area sites inorganic analytical data, none of the data was qualified as estimated due to calibration violations. The absence of inorganic calibration violations contributes to the high technical quality of the tidal area sites data.

3.3 LABORATORY AND FIELD BLANKS

Laboratory and field blank samples were analyzed to determine the existence and magnitude of contamination resulting from sample collection or laboratory activities (EPA 1990a, 1994). Blanks prepared and analyzed in the laboratory included calibration blanks and method/preparation blanks. Blanks collected in the field included source blanks, equipment rinsate blanks, and trip blanks. If a problem was identified with any blank, all associated data were carefully evaluated to determine whether the sample data were affected. The following table summarizes the purpose of each laboratory and field blank.

Blank Type	Purpose of Blank
Calibration blank	Evaluate analytical instruments for possible laboratory contamination
Method/preparation blank	Evaluate extraction or preparation procedures for possible laboratory contamination
Source blank	Evaluate source water (used for decontamination) as a possible source of field contamination
Equipment blank	Evaluate decontamination procedures as a possible route for field contamination
Trip blank	Evaluate shipment and storage procedures as a possible route for field contamination by volatile compounds

At a minimum, a calibration or a method/preparation blank was analyzed once every analytical period for each instrument. Method or preparation blanks were extracted (or prepared) at a frequency of one per extraction or preparation batch per matrix, or per 20 samples, whichever was greater (EPA 1990b, 1990c). One source or field blank was collected during the tidal area sites sampling period. No detected analytes were found in the field blank.

For each sampling task, equipment rinsate blanks were collected daily for a specified set of sample analyses. Because each sampling task used different sample collection devices, equipment rinsate blanks were analyzed for the same analytes of concern as the samples collected with the equipment. Table K-8 summarizes analytes detected in the equipment rinsate blanks.

One trip blank accompanied each cooler containing water samples for volatiles analyses. Trip blanks were analyzed for volatile compounds only, because these compounds have the greatest potential for cross contamination during sample transport. No analytes were detected in the trip blanks.

Where laboratory blank contamination was identified, sample results were compared to an action level of five times the highest level found in the associated laboratory blank, except for the followinmg compounds that EPA (1990a) has identified as common laboratory contaminants: acetone, methylene

chloride, phthalate compounds, 2-butanone, and toluene. Toluene is included only when other substituted benzene compounds do not appear in the environmental sample. These compounds were assessed in all samples (including field blanks) at an action level of 10 times the highest level found in the associated laboratory blanks (EPA 1990a). Only detected results less than the action level for the laboratory blank contaminant were considered nondetected, either at the level of the original result or at the CRQL (for organic samples only), whichever was greater (EPA 1990a, 1994). The data were qualified as "U1," indicating the results were nondetected and reflecting a detection or quantitation limit that may have been raised due to low-level laboratory blank contamination. As shown in Table K-10, most organic contamination in laboratory blanks consisted of the following compounds: acetone, methylene chloride, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and heptachlor. The majority of metals contamination consisted of antimony, beryllium, chromium, mercury, molybdenum, vanadium, and zinc.

After laboratory blank contamination was assessed, field blanks were evaluated. Where field blank contamination was identified, sample results were compared to an action level of five times the highest level found in the associated field blank. Only detected results less than the action level for the field blank contaminant were considered nondetected, either at the level of the original result or at the CRQL (for organic samples only), whichever was greater (EPA 1990a, 1994). The data were qualified as "U8," indicating the results were considered nondetected and reflecting a detection or quantitation limit that may have been raised due to low-level field blank contamination. Field blanks were not used to qualify other blank samples for blank contamination, but were used to evaluate analytical samples. For tidal area sites, contamination of the organic field blanks primarily resulted from using less than ideal source water in the decontamination process. Organic contaminants including acetone and bis(2-ethylhexyl)phthalate, were detected in field and equipment blanks. The majority of metals detected consisted of antimony, arsenic, mercury, molybdenum, and zinc. These contaminants had minimal impact on tidal area sites data.

After laboratory and field blank contamination were evaluated, common laboratory contaminants were assessed. EPA (1990a) has identified the following compounds as common laboratory contaminants: acetone, methylene chloride, phthalate compounds, 2-butanone, and toluene. Toluene is included only when other substituted benzene compounds do not appear in the environmental sample. In some cases,

although the common laboratory contaminant was not found in any of the associated blanks, all sample results less than five times the CRQL were qualified nondetected (U1). The qualification was the result of professional judgment based on whether a common laboratory contaminant was present in other blanks associated with the project and the laboratory (EPA 1990a). As shown in Table K-10, the following common laboratory contaminants were detected: acetone, methylene chloride, 2-butanone, and phthalate compounds.

Table K-10 also summarizes tidal area sites analytical data qualified due to blank contamination (U1 and U8). Of all tidal area sites analytical data, only 2.3 percent of the data was qualified as nondetected due to laboratory contamination, while only 0.11 percent was qualified as nondetected due to field contamination. These percentages indicate that most blank contamination originated in the laboratory. The small percentage of samples affected by field contamination indicates that the field equipment decontamination procedures were effective. Except for the qualified items mentioned above, the general quality of the analytical data was not significantly compromised by laboratory or field contamination.

3.4 ACCURACY

One objective of data validation was to assess the accuracy of the chemical data set. Laboratory accuracy was evaluated based on recoveries of surrogate spikes, MSs, and LCS spikes. Table K-11 summarizes all applicable accuracy requirements by analysis and includes the criteria for estimating and rejecting analytical results when accuracy requirements are not met. For organic analyses using surrogate spikes, laboratory accuracy could be evaluated for individual samples. However, for organic analyses, matrix effects frequently present unique problems in evaluating laboratory accuracy (EPA 1990a). In some cases, professional judgment was used to qualify the data. Any such decisions were clearly identified and documented in the data validation reports. Data affected by surrogate recoveries outside QC limits were qualified as "J4," indicating the results were estimated, or in severe cases "R4," indicating the results were rejected (EPA 1990a). For the inorganic analyses, laboratory accuracy was evaluated using LCS spike and MS recoveries. In general, data affected by LCS or MS recoveries outside QC limits were qualified as "J4," indicating the results were estimated. In a few isolated cases where LCS or MS recoveries were very low (less than 50 percent and 30 percent, respectively), the affected nondetected data were qualified as "R4," indicating the results were rejected (EPA 1994).

Table K-12 summarizes tidal area sites analytical data qualified due to accuracy criteria violations (J4 and R4). Of all tidal area sites analytical data, about 3.3 percent was qualified as estimated due to accuracy criteria violations, while only 0.34 percent was qualified as rejected. Most of the estimated (J4) organic data were due to CLP pesticide/PCB surrogate recoveries that were outside the advisory QC limits. In the most recent version of CLP pesticide/PCBs analysis, EPA significantly widened the advisory limits from the original requirements of between 60 and 150 percent. If the new widened criteria were applied to these data, very little of the CLP pesticides/PCB data would have been qualified for surrogate recoveries. For the inorganic analyses, most of the estimated (J4) inorganic data were due to hexavalent chromium, sulfides, CLP, and WET CLP metal MS recoveries that were outside the QC limits; this type of accuracy problem reflects matrix interference, not analytical performance issues. Rejected data were limited to one CLP semivolatile soil sample, 14 soil and 2 surface water samples for the explosive compound tetryl, one water sample for all explosive compounds, 34 hexavalent chromium soil samples, and 23 sulfide soil samples; along with some inorganic analyte recoveries that were particularly problematic. Sulfide and hexavalent chromium analyses are particualrly subject to matrix interference in the type of matrix found in the tidal areas. Most metal accuracy problems were due to poor spike recoveries for antimony, chromium, and lead. In general, the low frequency of accuracy criteria violations indicates that the tidal area sites data are of acceptable quality, yet are somewhat affected by matrix interferences. This very low frequency of accuracy violations contributes to the high technical quality of the tidal area sites data.

3.5 PRECISION: FIELD AND LABORATORY

Another objective of data validation was to assess the precision of the chemical data set. Laboratory precision was evaluated by the relative percent differences (RPD) of the MS/MSDs for organic analyses and by the RPDs of the sample/sample duplicates for inorganic analyses. For organic analyses, RPDs were used to evaluate overall precision and were not used specifically to qualify data. Precision goals for organic analyses can be found in the QAPjP (PRC 1994). For inorganic analyses, sample/sample duplicate RPDs were used to indicate the laboratory's analytical precision within a sample delivery group (SDG) for that matrix. Inorganic sample/sample duplicates were reviewed according to the following criteria (EPA 1994):

- An RPD criterion of ± 20 percent was used for water sample values greater than five times the contract-required detection limit (CRDL).
- An RPD criterion of ± 35 percent was used for soil sample values greater than five times the CRDL.
- An absolute difference of ± the CRDL was used for water sample results less than five times the CRDL.
- An absolute difference of ± two times the CRDL was used for soil sample results less than five times the CRDL.
- An RPD criterion of ± 10 percent was used for the pH analysis.

Inorganic data affected by sample/sample duplicate RPDs outside QC limits were qualified as "J5," indicating the results were estimated (EPA 1994). Data were not rejected based on precision criteria violations. Table K-13 summarizes tidal area sites analytical data qualified due to precision criteria violations (J5). Of all tidal area sites analytical data, 0.66 percent of the data was qualified as estimated due to precision criteria violations. This low frequency of precision criteria violations contributes to the high technical quality of the tidal area sites data.

One field duplicate soil sample and nine field duplicate water samples were collected during tidal area sites field activities. Table K-14 presents these duplicate results for detected analytes only. The chemical data were not qualified based on field duplicate precision exceedances (EPA 1990a, 1994). Generally, RPDs calculated for field duplicate sample precision were less than ± 25 percent for analytes detected above the CRQL. Due to the variability of instrument detection at low concentrations, higher RPDs were calculated for analytes with detected results at or below the CRQL. Overall precision for field duplicate water samples (±25% RPD) were acceptable. These results indicate the consistency of the tidal area sites sampling methodology, which contributes to the high technical quality of the data.

3.6 ANALYTICAL/MATRIX PERFORMANCE

In addition to data quality requirements discussed above, additional laboratory QA/QC criteria were evaluated in the cursory review. These additional criteria were primarily concerned with analytical and matrix performance; they are summarized in Table K-15 for organic analyses and Table K-16 for inorganic analyses. For organic analyses, where applicable, internal standard performance was

evaluated. Internal standard performance criteria ensures that gas chromatography/mass spectrometry (GC/MS) sensitivity and response are stable during every analytical run. However, matrix effects frequently present unique problems in evaluating analytical performance, and internal standard performance may be affected by such matrix effects. Internal standard requirements are based on the comparison of the sample's internal standard area with the same internal standard's area found in the daily calibration standard. The internal standard area of the sample must be within 50 to 150 percent, and internal standard retention times must not vary by more than ± 30 seconds from the internal standard in the associated daily calibration standard (EPA 1990a).

ICPES serial dilutions were evaluated for inorganic analyses where applicable. ICPES serial dilution analysis determined whether matrix interferences existed and if the accuracy of the analytical data was affected. The criterion for acceptability is a %D of less than 10 percent when the results of a five-fold dilution are compared to the results from the undiluted sample. This criterion applies only when the concentration of the element in the undiluted sample is at least 50 times the instrument detection limit (IDL).

In addition, for some organic analyses such as pesticides and PCBs, the analysis is performed on two columns. Single peak results were checked for quantitative agreement between the two columns by generating an RPD value. Detected results with RPDs greater than 50 percent and less than 100 percent were qualified as "J7," indicating the results were estimated. Because matrix effects frequently present unique problems in analyte identification, results with RPDs greater than 100 percent were technically determined to be misidentified and qualified as "U7," indicating the results were nondetected (EPA 1990a). Misidentified results below the CRQL were raised to the quantitation limit and considered nondetected. In some cases professional judgment was used in qualifying the result as estimated (J7) or nondetected (U7). Any such decisions were clearly identified and documented in the data validation reports.

In general, organic or inorganic data affected by any of the above-mentioned criteria violations were qualified as "J7," indicating the results were estimated. Organic data with internal standard areas less than 10 percent of the internal standard's area in the associated daily standard were qualified as "R7," indicating that the results were rejected for nondetected results, or "J7," indicating the results were estimated for detected results. Table K-17 summarizes tidal area sites analytical data qualified due to

analytical/matrix performance criteria violations (J7 and R7). Of all tidal area sites analytical data, 2.8 percent was qualified as estimated, and only 0.12 percent of the data was qualified as rejected due to analytical/matrix performance violations. Of all tidal area sites CLP pesticide/PCB, low level CLP pesticide/PCB, and explosives data, 3.9 percent was qualified as estimated (J7), and only two PCB compounds were qualified as nondetected (U7) due to identification violations. Most estimated data (J7) for metals were due to CLP and WET CLP metals ICPES serial dilutions that exceeded QC limits. The serial dilution problems are attributed to matrix interferences, rather than analytical performance issues. Only one water and one soil sample for CLP semivolatile compounds were rejected, each due to internal standard problems. This low frequency of analytical and matrix criteria violations contributes to the high technical quality of the tidal area sites data.

3.7 RESULTS BELOW THE CRQL

Analytical instruments can make reliable *qualitative* identification of compounds at concentrations below the CRQL for CLP volatiles, CLP semivolatiles, low-level CLP semivolatiles, CLP pesticides/PCBs, low-level CLP pesticides/PCBs, TPH-purgeables, TPH-extractables, explosives, and dioxins. Results below the CRQL, and therefore outside the calibration range, are considered *quantitatively* uncertain. Sample results below the CRQL were reported by the laboratory with a "J" qualifier and were subsequently qualified in data validation as "J2," indicating the results were estimated. Table K-18 summarizes tidal area sites data qualified as estimated due to results reported below the CRQL. Of all tidal area sites analytical data, only 1.3 percent was qualified as estimated due to results reported below the CRQL.

4.0 FULL REVIEW

A full review was conducted at random on 10 percent of the tidal area sites chemical data. In addition to the cursory review discussed above, full review for CLP organic, CLP inorganic, and non-CLP methods included evaluating the following requirements, as applicable: method compliance, instrument performance check samples, cleanup performance check samples, system performance, ICPES interference check samples, graphite furnace atomic absorption (GFAA) duplicate injections, GFAA analytical or post digestion spikes, GFAA method of standard additions (MSA), hexavalent chromium

qualitative interference check samples, target analyte identification, tentatively identified compound (TIC) identification, analyte quantitation, detection/quantitation limit verification, and overall assessment of the data. Data qualification during the full review was conducted in accordance with criteria specified

in EPA guidelines, the QAPjP, and associated analytical methods. Sections 4.1 through 4.4 discuss the components of the full review and the results of each specific assessment.

4.1 ADDITIONAL ANALYTICAL AND MATRIX PERFORMANCE

In addition to the cursory review discussed in Section 3.0, the laboratory must met additional QA/QC criteria. These additional requirements are primarily concerned with analytical and matrix performance. For organic analyses, the following requirements were evaluated, as applicable: instrument performance check samples (CLP volatiles, CLP semivolatiles, and CLP pesticides/PCBs) and cleanup performance check samples for florisil cartridges and gel-permeation chromatography (GPC) (CLP semivolatiles, and CLP pesticides/PCBs). Organic performance criteria are listed in Table K-15.

GC/MS instrument performance check samples (CLP volatiles and CLP semivolatiles) were analyzed to ensure mass resolution, identification, and to some degree, sensitivity. Specifically, minimum and maximum ion abundance requirements must be met for bromofluorobenzene (BFB) in volatile analysis and decafluorotriphenylphosphine (DFTPP) in semivolatile analysis. GC/electron capture detector (ECD) instrument performance check samples (CLP pesticides/PCBs) were analyzed to ensure adequate resolution and instrument sensitivity. Analytical requirements for nine target analytes and surrogates include the following criteria: RPD between the true and actual values, chromatographic resolution, and percent breakdown for 4,4'-DDT and endrin (EPA 1990b).

CLP semivolatiles and CLP pesticides/PCBs cleanup check samples were analyzed to verify the recovery of the target analytes through the cleanup processes. Florisil and GPC cleanup processes remove matrix interferences from sample extracts prior to analysis. The cleanup processes are checked by running a blank spike through the florisil cartridge or GPC column and calculating the %R. GPC is checked weekly, and florisil cartridges are evaluated once for each manufacturer's lot (EPA 1990b).

For inorganic analyses, the following requirements were evaluated, as applicable: ICPES interference check samples, GFAA duplicate injections, GFAA analytical spikes, GFAA MSAs, and hexavalent chromium qualitative interference check samples. The ICPES interference check sample verifies the validity of the laboratory's interelement and background correction factors. High levels of aluminum, iron, calcium, and magnesium can affect sample results if the interelement and background correction factors have not been optimized. Inaccurate correction factors may result in false positives, false negatives, or biased results. GFAA duplicate injections and furnace analytical spikes establish the precision and accuracy of each analyte. MSAs were performed on samples when the GFAA analytical spike did not meet required QC criteria and the initial sample concentration (of the target analyte) was equal to or greater than 50 percent of the spike concentration. MSAs were prepared using one analysis of the sample and three analyses of the sample plus spikes; the spikes contained analyte concentrations at 50 percent, 100 percent, and 150 percent of the sample's suspected concentration. The absolute value of the x-intercept of the curve where x equals the sample plus no spike, multiplied by any dilution performed is reported as the actual sample concentration (EPA 1990c). Hexavalent chromium interference check samples were performed to ensure the qualitative response of the methodology.

In general, data affected by any of the above mentioned criteria violations were qualified as "J7," indicating the results were estimated. In particular, when GFAA analytical spike requirements were not met, the affected data were qualified either as "J4," indicating the results were estimated, or in severe cases "R4," indicating the results were rejected. When GFAA duplicate requirements were not met, the affected data were qualified as "J5," indicating the results were estimated. For tidal area sites, the additional analytical and matrix performance requirements resulted in only a small amount of estimated data. Sections 3.4 through 3.6 discusses the total percent of data qualified "J4" or "R4," "J5," "J7," or "R7" respectively. The low frequency of additional analytical or matrix performance violations contributes to the high technical quality of the tidal area sites data.

4.2 ANALYTE IDENTIFICATION

To minimize erroneous identification of compounds, qualitative criteria for compound identification have been established. An erroneous identification can either be a false positive (reporting a compound present when it is not) or a false negative (not reporting a compound that is present). For CLP volatiles and CLP semivolatiles, identifications were made by comparing a sample's mass spectra and retention

time to the standard's mass spectra and retention time. For positive identification, the compound's mass spectra must meet the following criteria: (1) it must contain all the standard's ions with relative intensities greater than 10 percent, (2) it must agree within ± 20 percent of the standard ion's relative intensities, and (3) it must not contain any unaccounted ions with relative intensities greater than 10 percent. In addition, the retention time must be within ± 0.06 relative retention time (RRT) units of the standard component's retention time (EPA 1990b).

Chromatographic peaks in CLP volatiles and CLP semivolatiles analyses that are not target analytes, surrogates, or internal standards may be reported as TICs. TICs were qualitatively identified using the National Institute of Standards and Technology (NIST) mass spectral library search. All TIC library identifications were assessed by an experienced professional using the same guidelines for identifying target analytes to positively identify TICs (EPA 1990b). Frequently a general classification, such as substituted benzene or chlorinated hydrocarbon, was used when the identification requirements were not completely met. Some TICs cannot be identified by comparison with the NIST library and were reported as unknowns. Some CLP volatile and CLP semivolatile TICs were identified as laboratory contaminants. These TIC results were qualified as "R," indicating the results were rejected (EPA 1990a). Rejected TICs were not maintained in the database of RI analytical results.

CLP pesticides/PCBs, low level CLP pesticides/PCBs, and explosives were positively identified when a peak fell within the specified retention time "windows" on two dissimilar columns. Surrogates and MSs were also strictly evaluated to determine any shifts in retention time. In some cases professional judgment was used to qualify a result as estimated (J7) or nondetected (U7). Any such evaluations were clearly identified and documented in the data validation reports.

TPH-purgeables and TPH-extractables were positively identified when a response was recorded in the appropriate retention time windows for the particular analysis. For TPH-purgeables and TPH-extractables, fuels were identified using a more definitive fingerprinting of the chromatographic peaks for the type of petroleum product. When the chromatographic peaks fell outside the standard ranges or displayed a petroleum fuel product other than gasoline, diesel, or motor oil, the data were qualified as "Y," indicating that the compound was a petroleum fuel. When a single peak or patterns were detected that did not resemble typical fuel patterns, the data were qualified as "Z," indicating that the results did not represent a typical fuel.

CLP metals, CLP cyanide, hexavalent chromium, TOC, pH, and sulfides were positively identified when the instrument registered a measurable response while operating under the method-specified analytical parameters. In these cases, the instrument's accuracy in analyte identification is indirectly verified by assessing the instrument's performance. Instrument performance criteria for CLP metals, hexavalent chromium, TOC, pH, and sulfides were discussed above in Sections 3.6 and 4.1.

4.3 ANALYTE QUANTITATION

All applicable raw data were reviewed to verify positive results and the reported detection or quantitation limits. About 10 percent of the calculations were evaluated for reproducibility. Raw data reviewed included the following as applicable; extraction and preparation logbooks, cleanup logbooks, spike and standard preparation logbooks, instrument printouts, strip chart recordings, chromatograms, and quantitation reports. The following were also evaluated, as applicable: sample dilutions, concentrations, analytical splits, cleanup activities, and percent moisture. Review of the raw data showed that the tidal area sites chemical data were properly quantitated.

4.4 ANALYTE REPORTING LIMITS

Analyte reporting limits for soil samples are directly affected by dilutions and percent moisture. All soil sample results were corrected for percent moisture. For tidal area sites data, corrected results were reported with detection or quantitation limits raised by an average of 2.5 percent. In addition, detection or quantitation limits for both soil and water samples were raised by the dilution factor when samples required dilution for analysis. Sample dilution was necessary when high levels of an analyte were present or when matrix problems occurred during sample extraction or analysis. Review of the tidal area sites chemical data set indicated that 14.9 percent of the data required dilution and, as a result, very few reporting detection or quantitation limits were raised. Table K-19 summarizes the average reporting limits for tidal area sites and lists the reporting limit goals established in the QAPjP (PRC 1994).

5.0 PARCC EVALUATION SUMMARY

The following sections briefly summarize the overall tidal area sites data quality, including the accuracy, precision, completeness, comparability, and representativeness.

5.1 ACCURACY

Accuracy assesses how close an experimental value is to the true or reference value. The primary indicators of accuracy include the recoveries of surrogate spikes, MSs, and LCS spikes. The accuracy of the tidal area sites data can be summarized as follows:

- For CLP volatiles, CLP semivolatiles, low-level CLP semivolatiles, CLP pesticides/PCBs, low-level CLP pesticides/PCBs, TPH-purgeables, TPH-extractables, aromatic volatiles, dioxins, and explosives, the surrogate spike, MS, and LCS spike recoveries were generally good, indicating that the methods were consistently accurate. A small amount of CLP semivolatiles and explosives data was rejected due to poor surrogate spike recoveries.

- For CLP metals, the LCS spike and MS recoveries were generally good, indicating that this method was accurate at levels above the CRDL. A small amount of CLP metals data, particularly results for antimony and selenium, was rejected due to poor MS or LCS recoveries, which can be attributed to matrix interference problems.

- For TOC and sulfides, the LCS and MS recoveries were excellent, indicating that the methods were consistently accurate.

- For hexavalent chromium, the LCS spike recoveries were excellent, indicating that the method was consistently accurate. However, the MS recoveries were problematic, reflecting a matrix interference that can be expected in the tidal area site matrix. Problematic MS recoveries do not represent analytical problems.

5.2 PRECISION

Precision is a measure of the reproducibility of an experimental value without regard to the true or reference value. The primary indicators of precision of the tidal area sites data were the RPD of the MS/MSD in organic analyses and the RPD of the sample/sample duplicate in inorganic analyses. The precision of the tidal area sites data can be summarized as follows:

- Sample/sample duplicate RPDs for CLP and WET metals were generally within the QA/QC criteria, indicating that the precision of this method was good at levels above the CRDL. Poor duplicate results were generally obtained for analytes detected below the CRDL, suggesting that the precision of this method became approximate at levels between the CRDL and IDL.

- Organic MS/MSD RPDs were generally good, indicating that the methods were consistently precise.

- For hexavalent chromium, pH, and sulfides, all sample duplicate analyses were excellent, indicating that the methods were consistently accurate.
- For TOC, all sample duplicate analyses were generally within the QA/QC criteria, indicating that the precision of this method was good at levels above the CRDL. Relatively few TOC results were affected by imprecision.

5.3 COMPLETENESS

Completeness is defined as the percentage of analytical results considered to be valid. Valid data are those identified as acceptable or qualified as estimated (J) during the data validation process. Data qualified as rejected (R) are not valid and are considered unusable.

For the tidal area sites data, rejected and unusable data were qualified during the cursory review due to the following: calibration problems, low surrogate spike recovery, low LCS or MS recovery, or low internal standard areas. The full review of 10 percent of the tidal area sites data did not yield any additional rejected data.

The assessment of completeness consisted of comparing the amount of acceptable and usable results to the total number of results. The tidal area sites data evaluated in this QCSR displayed an estimated completeness of greater than 99 percent, which is considered very high and indicates high quality data. In fact, the completeness goal of 90 percent established in the QAPjP (PRC 1994) was greatly exceeded. In addition, EPA has indicated that Level IV data sets achieve an average completeness of only 80 percent nationwide (EPA 1987).

5.4 COMPARABILITY

Comparability is a qualitative assessment of how well one data set compares to another. The important determinants of comparability include the uniformity of sampling activities, analytical procedures, data reporting, and data validation. The use of CLP protocol, specific EPA analyses, approved laboratories, and the standardized process of data review and validation give the tidal area sites data a high degree of comparability.

5.5 REPRESENTATIVENESS

Representativeness refers to how well sample data accurately reflect true environmental conditions. Determinants of representativeness include sampling locations, frequency, collection procedures, and possible compromises to sample integrity (for example, cross-contamination) that can occur during collection, transport, and analysis. Selection of representative sampling sites is important to ensure that the medium sampled is typical of the site. Correct sample collection, transport, and analytical procedures are also important to ensure that samples closely resemble the medium sampled with a minimum of cross-contamination.

For tidal area sites, the sampling locations, frequency, and collection protocols were described in the field sampling and analysis plan (FSAP) (PRC 1995). These protocols followed standard accepted methods of site characterization and were approved by the regulatory agencies. As a result, with respect to accepted site characterization approaches, existing guidance, and regulatory compliance, the sampling program for tidal area sites met all relevant requirements for data representativeness.

6.0 CONCLUSIONS FOR DATA QUALITY AND DATA USABILITY

Although some qualifiers were added to the data, a final review of the data set with respect to the EPA data quality parameters discussed in Section 5.0 indicates that the data are of high overall quality. The data meet all of the requirements of Level IV data as described in "Data Quality Objectives for Remedial Response Activities" (EPA 1987) and all the requirements of "definitive data" as described in the "Data Quality Objectives Process for Superfund" (EPA 1993). Because the data meet all applicable requirements, they can be used for site characterization, risk assessment, and feasibility studies. The overall assessment of the sampling program, QA/QC data, data review, and data validation results presented in Sections 3.0 and 4.0 is that the tidal area sites data are generally of acceptable accuracy, precision, completeness, comparability, and representativeness. All supporting documentation and data are available upon request, including cursory and full validation reports and the database that contains the sample results and summaries of qualified data.

EPA guidance was used to determine the usability of the validated data. This guidance is provided in the document "Risk Assessment Guidance for Superfund" (RAGS), Volume I (EPA 1989). Exhibit 5-5 in

RAGS states that data qualified as estimated (J) based on data validation reports may be used in quantitative risk assessments. Only data qualified as rejected (R) are considered unusable for risk assessment purposes. If data are of acceptable quality for use in quantitative risk assessments, they should also be appropriate for determining the extent of contamination. For consistency, a single data set was used for determining potential human health risk and the extent of contamination at tidal area sites. Accordingly, all J-qualified data and no R-qualified data were used for the tidal area sites RI.

TABLE K-1

ANALYTICAL METHODS, SAMPLE HOLDING TIMES, CONTAINERS, AND PRESERVATION

NAVAL WEAPONS STATION CONCORD

Parameter	Method (Reference) Technique	Matrix	Holding Time	Container	Preservation
CLP volatiles	CLP SOW (EPA 1990b)/ GC/MS	Water	14 days for preserved 7 days for unpreserved	3 x 40-mL vial with Teflon-lined septa caps	Cool to 4 °C, add HCl to pH<2
		Soil	14 days	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
CLP semivolatiles	CLP SOW (EPA 1990b)/ GC/MS	Water	7 days to extraction 40 days to analysis	2 x 1-L amber glass with Teflon-lined lid	Cool to 4 °C
		Soil	14 days to extraction 40 days to analysis	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
Low-level CLP semivolatiles	CLP SOW (EPA 1990b)/ GC/MS	Water	7 days to extraction 40 days to analysis	2 x 1-L amber glass with Teflon-lined lid	Cool to 4 °C
		Soil	14 days to extraction 40 days to analysis	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C

TABLE K-1

ANALYTICAL METHODS, SAMPLE HOLDING TIMES, CONTAINERS, AND PRESERVATION

NAVAL WEAPONS STATION CONCORD (Continued)

Parameter	Method (Reference)/ Technique	Matrix	Holding Time	Container	Preservation
CLP pesticides/ polychlorinated biphenyls (PCB)	CLP SOW (EPA 1990b)/ GC/ECD	Water	7 days to extraction 40 days to analysis	2 x 1-L amber glass with Teflon-lined lid	Cool to 4 °C
		Soil or sediment	14 days to extraction 40 days to analysis	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
Low-level CLP pesticides/ polychlorinated biphenyls	CLP SOW (EPA 1990b)/ GC/ECD	Water	7 days to extraction 40 days to analysis	2 x 1-L amber glass with Teflon-lined lid	Cool to 4 °C
		Soil or sediment	14 days to extraction 40 days to analysis	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
CLP metals	CLP SOW (EPA 1990c)/ ICPES; GFAA; and CVAA	Water	28 days for mercury 6 months for others	1-L polyethylene bottle	Cool to 4 °C, HNO_3 to pH<2
		Soil or sediment	28 days for mercury 6 months for others	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C

TABLE K-1

ANALYTICAL METHODS, SAMPLE HOLDING TIMES, CONTAINERS, AND PRESERVATION

NAVAL WEAPONS STATION CONCORD (Continued)

Parameter	Method (Reference)/ Technique	Matrix	Holding Time	Container	Preservation
Dioxins	EPA 8280 (EPA 1992)/ GC/MS	Water	14 days to extraction 14 days to analysis	2 x 1-L amber glass with Teflon-lined lid	Cool to 4 °C
		Soil	28 days to extraction 14 days to analysis	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
Total petroleum hydrocarbons-purgeables	EPA 5030/8015 (EPA 1992)/ LUFT Field Manual (LUFT Task Force 1989)/GC/FID	Water	14 days	3 x 40-mL vial with Teflon-lined septa caps	Cool to 4 °C, HCl to pH<2
		Soil	14 days	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
Total Suspended Solids	EPA 160.1 (MCAWW 1992)/gravimetric	Water	7 days	1-L polyethylene bottle	Cool to 4 °C

TABLE K-1

ANALYTICAL METHODS, SAMPLE HOLDING TIMES, CONTAINERS, AND PRESERVATION

NAVAL WEAPONS STATION CONCORD (Continued)

Parameter	Method/ Technique	Matrix	Holding Time	Container	Preservation
Total petroleum hydrocarbons-extractables	EPA 8015 (EPA 1992)/ LUFT Field Manual (LUFT Task Force 1989)/GC/FID	Water	7 days to extraction 40 days to analysis	2 x 1-L amber glass with Teflon-lined lid	Cool to 4 °C
		Soil	14 days to extraction 40 days to analysis	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
Aromatic volatiles	EPA 5030/8020 (EPA 1992)/ GC/PID	Water	14 days for preserved 7 days for unpreserved	3 x 40-mL vial with Teflon-lined septa caps	Cool to 4 °C, add HCl to pH<2
		Soil	14 days	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C

TABLE K-1

ANALYTICAL METHODS, SAMPLE HOLDING TIMES, CONTAINERS, AND PRESERVATION

NAVAL WEAPONS STATION CONCORD (Continued)

Parameter	Method/ Technique	Matrix	Holding Time	Container	Preservation
Hexavalent chromium	EPA 7196 (EPA 1992)/ colorimetric	Water	1 day	1 x 500-mL polyethylene	Cool to 4 °C
		Soil	3 days to extraction 1 day to analysis	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
Total organic carbon	SMEWW 5310B (APHA 1992)/ ultraviolet spectroscopy	Water	28 days	2 x 250-mL amber with Teflon-lined lids	Cool to 4 °C
		Soil	28 days	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
pH	EPA 9040/9045 (EPA 1992)/ electrometric	Water	24 hours	1 x 1-L polyethylene	Cool to 4 °C
		Soil	2 days	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C

TABLE K-1

ANALYTICAL METHODS, SAMPLE HOLDING TIMES, CONTAINERS, AND PRESERVATION

NAVAL WEAPONS STATION CONCORD (Continued)

Parameter	Method/ Technique	Matrix	Holding Time	Container	Preservation
Sulfides	EPA 376.2 (MCAWW 1992)/ colorimetric	Water	28 days	1 x 500-mL polyethylene	Cool to 4 °C
		Soil	28 days	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
Modified waste extraction test for CLP metals	Waste extraction test (State of California 1990)/ ICPES; GFAA; and CVAA	Soil	28 days to extraction or analysis for mercury 6 months to extraction or analysis for all other CLP metals	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C
Explosives	EPA 8330(1992/ HPLC	Water	7 days to extraction 40 days to analysis[b]	2 x 1-L amber glass with Teflon-lined lids	Cool to 4 °C
		Soil	14 days to extraction 40 days to analysis[b]	Glass jars with Teflon-lined lids or brass/acetate sleeves[a]	Cool to 4 °C

TABLE K-1

ANALYTICAL METHODS, SAMPLE HOLDING TIMES, CONTAINERS, AND PRESERVATION

NAVAL WEAPONS STATION CONCORD (Continued)

Notes:

▪	When soil samples were collected in sleeves, the ends were covered with Teflon liners and a hard plastic caps
CLP	Contract Laboratory Program
SOW	Statement of Work
GC	Gas chromatography with the following detectors: mass spectrometry (MS); electron capture detector (ECD); photoionization detector (PID); flame ionization detector (FID); and flame photometric detector (FPD)
mL	Milliliter
HCl	Hydrochloric acid
L	Liter
ICPES	Inductively coupled plasma emission spectroscopy
GFAA	Graphite furnace atomic absorption
CVAA	Cold vapor atomic absorption
HNO_3	Nitric acid
HPLC	High performance liquid chromatography
NaOH	Sodium hydroxide
EPA	U.S. Environmental Protection Agency
LUFT	Leaking Underground Field Tank Field Manual
H_2SO_4	Sulfuric Acid
MCAWW	Methods for the Chemical Analysis of Water and Wastes
SMEWW	Standard Methods for the Evaluation of Water and Wastewater
NOAA	National Oceanic and Atmospheric Administration
ASTM	American Society of Testing and Materials

TABLE K-2

HOLDING TIME REQUIREMENTS

NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Holding Time[a] Requirement	All Estimated Data (J3)	Data Qualified as "J3" (Estimated) and Nondetected Data Qualified as "R3" (Rejected)
CLP volatiles, total petroleum hydrocarbons-purgeables, and aromatic volatiles	Water or soil	Analysis in 14 days	Exceeded by ≤ 28 days	Exceeded by > 28 days
CLP volatiles and aromatic volatiles	Unpreserved water	Analysis in 7 days	Exceeded by ≤ 14 days	Exceeded by > 14 days
CLP semivolatiles, low-level CLP semivolatiles, CLP pesticides/ polychlorinated biphenyls (PCB), low-level CLP pesticides/PCBs, total petroleum hydrocarbons-extractables, and explosives	Water	Extraction in 7 days Analysis in 40 days[d]	Exceeded by ≤ 14 days (E)[b] Exceeded by ≤ 80 days (A)[c]	Exceeded by > 14 days (E) Exceeded by > 80 days (A)
	Soil or sediment	Extraction in 14 days Analysis in 40 days[d]	Exceeded by ≤ 28 days (E) Exceeded by ≤ 80 days (A)	Exceeded by > 28 days (E) Exceeded by > 80 days (A)

TABLE K-2

HOLDING TIME REQUIREMENTS

NAVAL WEAPONS STATION CONCORD (Continued)

Analysis	Matrix	Holding Time* Requirement	All Estimated Data (J3)	Data Qualified as "J3" (Estimated) and Nondetected Data Qualified as "R3" (Rejected)
Dioxins	Water	Extraction in 14 days Analysis in 14 days	Exceeded by ≤ 28 days Exceeded by ≤ 28 days	Exceeded by > 28 days Exceeded by > 28 days
	Soil	Extraction in 28 days Analysis in 14 days	Exceeded by ≤ 56 days Exceeded by ≤ 28 days	Exceeded by > 56 days Exceeded by > 56 days
CLP mercury and total organic carbon	Water, soil, or sediment	Analysis in 28 days	Exceeded by ≤ 56 days	Exceeded by > 56 days
CLP metals	Water, soil, or sediment	Analysis in 180 days	Exceeded by ≤ 360 days	Exceeded by > 360 days
Hexavalent chromium	Water	1 day	Exceeded by ≤ 6 days	Exceeded by > 6 days
	Soil	Extraction in 3 days Analysis in 1 day	Exceeded by ≤ 6 days (E) Exceeded by ≤ 6 days (A)	Exceeded by > 6 days (E) Exceeded by > 6 days (A)
pH	Water	24 hours	Exceeded by ≤ 6 days	Exceeded by > 6 days
	Soil	2 days	Exceeded by ≤ 6 days	Exceeded by > 6 days

TABLE K-2

HOLDING TIME REQUIREMENTS

NAVAL WEAPONS STATION CONCORD (Continued)

Analysis	Matrix	Holding Time[a] Requirement	All Estimated Data (J3)	Data Qualified as "J3" (Estimated) and Nondetected Data Qualified as "R3" (Rejected)
Sulfides	Water	28 days	Exceeded by ≤ 56 days	Exceeded by > 56 days
Total Suspended Solids	Water	7 days	Exceeded by ≤ 14 days	Exceeded by > 28 days
Modified waste extraction test for CLP metals	Soil	Extraction in 28 days for mercury Analysis in 28 days after extraction for mercury Extraction in 180 days for other metals Analysis in 180 days after extraction for other metals	Exceeded by ≤ 56 days for mercury (E) Exceeded by ≤ 56 days for mercury (A) Exceeded by ≤ 360 days for other metals (A) Exceeded by ≤ 360 days for other metals (E)	Exceeded by > 56 days for mercury (E) Exceeded by > 56 days for mercury (A) Exceeded by > 360 days for other metals (A) Exceeded by > 360 days for other metals (E)

Notes:
[a] Holding times are specified from the date of sample collection.
[b] Extraction
[c] Analysis

CLP Contract Laboratory Program

Source: Federal Register 1984; PRC 1994; and the specified analytical methods

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
CLP Volatiles				
1,1,1-TRICHLOROETHANE	WATER	2	1	0
1,1,2,2-TETRACHLOROETHANE	WATER	2	1	0
1,1,2-TRICHLOROETHANE	WATER	2	1	0
1,1-DICHLOROETHANE	WATER	2	1	0
1,1-DICHLOROETHENE	WATER	2	1	0
1,2-DICHLOROETHANE	WATER	2	1	0
1,2-DICHLOROETHENE (TOTAL)	WATER	2	1	0
1,2-DICHLOROPROPANE	WATER	2	1	0
2-BUTANONE	WATER	2	1	0
2-HEXANONE	WATER	2	1	0
4-METHYL-2-PENTANONE	WATER	2	1	0
BENZENE	WATER	2	1	0
BROMODICHLOROMETHANE	WATER	2	1	0
BROMOFORM	WATER	2	1	0
BROMOMETHANE	WATER	2	1	0
CARBON DISULFIDE	WATER	2	1	0
CARBON TETRACHLORIDE	WATER	2	1	0
CHLOROBENZENE	WATER	2	1	0
CHLOROETHANE	WATER	2	1	0
CHLOROFORM	WATER	2	1	0
CHLOROMETHANE	WATER	2	1	0
CIS-1,3-DICHLOROPROPENE	WATER	2	1	0
DIBROMOCHLOROMETHANE	WATER	2	1	0
ETHYLBENZENE	WATER	2	1	0
METHYLENE CHLORIDE	WATER	2	1	0
STYRENE	WATER	2	1	0
TETRACHLOROETHENE	WATER	2	1	0
TOLUENE	WATER	2	1	0

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
TRANS-1,3-DICHLOROPROPENE	WATER	2	1	0
TRICHLOROETHENE	WATER	2	1	0
VINYL CHLORIDE	WATER	2	1	0
XYLENE (TOTAL)	WATER	2	1	0
Total	WATER	66	32 (48.48%)	0 (0.00%)
CLP Semivolatiles:				
1,2,4-TRICHLOROBENZENE	SOIL	101	2	0
1,2-DICHLOROBENZENE	SOIL	101	2	0
1,3-DICHLOROBENZENE	SOIL	101	2	0
1,4-DICHLOROBENZENE	SOIL	101	2	0
2,2'-OXYBIS(1-CHLOROPROPANE)	SOIL	101	2	0
2,4,5-TRICHLOROPHENOL	SOIL	101	2	0
2,4,6-TRICHLOROPHENOL	SOIL	101	2	0
2,4-DICHLOROPHENOL	SOIL	101	2	0
2,4-DIMETHYLPHENOL	SOIL	101	2	0
2,4-DINITROPHENOL	SOIL	101	2	0
2,4-DINITROTOLUENE	SOIL	101	2	0
2,6-DINITROTOLUENE	SOIL	101	2	0
2-CHLORONAPHTHALENE	SOIL	101	2	0
2-CHLOROPHENOL	SOIL	101	2	0
2-METHYLNAPHTHALENE	SOIL	101	2	0
2-METHYLPHENOL	SOIL	101	2	0
2-NITROANILINE	SOIL	101	2	0
2-NITROPHENOL	SOIL	101	2	0
3,3'-DICHLOROBENZIDINE	SOIL	101	2	0
3-NITROANILINE	SOIL	101	2	0
4,6-DINITRO-2-METHYLPHENOL	SOIL	101	2	0
4-BROMOPHENYL-PHENYLETHER	SOIL	101	2	0
4-CHLORO-3-METHYLPHENOL	SOIL	101	2	0

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J3"	Number (Percent) of Analytes Rejected as "R3"
4-CHLOROANILINE	SOIL	101	2	0
4-CHLOROPHENYL-PHENYLETHER	SOIL	101	2	0
4-METHYLPHENOL	SOIL	101	2	0
4-NITROANILINE	SOIL	101	2	0
4-NITROPHENOL	SOIL	101	2	0
ACENAPHTHENE	SOIL	101	2	0
ACENAPHTHYLENE	SOIL	101	2	0
ANTHRACENE	SOIL	101	2	0
BENZO(A)ANTHRACENE	SOIL	101	2	0
BENZO(A)PYRENE	SOIL	101	2	0
BENZO(B)FLUORANTHENE	SOIL	101	2	0
BENZO(G,H,I)PERYLENE	SOIL	101	2	0
BENZO(K)FLUORANTHENE	SOIL	101	2	0
BIS(2-CHLOROETHOXY)METHANE	SOIL	101	2	0
BIS(2-CHLOROETHYL)ETHER	SOIL	101	2	0
BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	101	2	0
BUTYLBENZYLPHTHALATE	SOIL	101	2	0
CARBAZOLE	SOIL	101	2	0
CHRYSENE	SOIL	101	2	0
DI-N-BUTYLPHTHALATE	SOIL	101	2	0
DI-N-OCTYLPHTHALATE	SOIL	101	2	0
DIBENZ(A,H)ANTHRACENE	SOIL	101	2	0
DIBENZOFURAN	SOIL	101	2	0
DIETHYLPHTHALATE	SOIL	101	2	0
DIMETHYLPHTHALATE	SOIL	101	2	0
FLUORANTHENE	SOIL	101	2	0
FLUORENE	SOIL	101	2	0
HEXACHLOROBENZENE	SOIL	101	2	0
HEXACHLOROBUTADIENE	SOIL	101	2	0

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
HEXACHLOROCYCLOPENTADIENE	SOIL	101	2	0
HEXACHLOROETHANE	SOIL	101	2	0
INDENO(1,2,3-CD)PYRENE	SOIL	101	2	0
ISOPHORONE	SOIL	101	2	0
N-NITROSO-DI-N-PROPYLAMINE	SOIL	101	2	0
N-NITROSODIPHENYLAMINE (1)	SOIL	101	2	0
NAPHTHALENE	SOIL	101	2	0
NITROBENZENE	SOIL	101	2	0
PENTACHLOROPHENOL	SOIL	101	2	0
PHENANTHRENE	SOIL	101	2	0
PHENOL	SOIL	101	2	0
PYRENE	SOIL	101	2	0
Total	SOIL	6464	128 (1.98%)	0 (0.00%)
1,2,4-TRICHLOROBENZENE	WATER	60	1	0
1,2-DICHLOROBENZENE	WATER	60	1	0
1,3-DICHLOROBENZENE	WATER	60	1	0
1,4-DICHLOROBENZENE	WATER	60	1	0
2,2'-OXYBIS(1-CHLOROPROPANE)	WATER	60	1	0
2,4,5-TRICHLOROPHENOL	WATER	60	1	0
2,4,6-TRICHLOROPHENOL	WATER	60	1	0
2,4-DICHLOROPHENOL	WATER	60	1	0
2,4-DIMETHYLPHENOL	WATER	60	1	0
2,4-DINITROPHENOL	WATER	60	1	0
2,4-DINITROTOLUENE	WATER	60	1	0
2,6-DINITROTOLUENE	WATER	60	1	0
2-CHLORONAPHTHALENE	WATER	60	1	0
2-CHLOROPHENOL	WATER	60	1	0
2-METHYLNAPHTHALENE	WATER	60	1	0
2-METHYLPHENOL	WATER	60	1	0

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J3"	Number (Percent) of Analytes Rejected as "R3"
2-NITROANILINE	SWATER	60	1	0
2-NITROPHENOL	SWATER	60	1	0
3,3'-DICHLOROBENZIDINE	SWATER	60	1	0
3-NITROANILINE	SWATER	60	1	0
4,6-DINITRO-2-METHYLPHENOL	SWATER	60	1	0
4-BROMOPHENYL-PHENYLETHER	SWATER	60	1	0
4-CHLORO-3-METHYLPHENOL	SWATER	60	1	0
4-CHLOROANILINE	SWATER	60	1	0
4-CHLOROPHENYL-PHENYLETHER	SWATER	60	1	0
4-METHYLPHENOL	SWATER	60	1	0
4-NITROANILINE	SWATER	60	1	0
4-NITROPHENOL	SWATER	60	1	0
ACENAPHTHENE	SWATER	60	1	0
ACENAPHTHYLENE	SWATER	60	1	0
ANTHRACENE	SWATER	60	1	0
BENZO(A)ANTHRACENE	SWATER	60	1	0
BENZO(A)PYRENE	SWATER	60	1	0
BENZO(B)FLUORANTHENE	SWATER	60	1	0
BENZO(G,H,I)PERYLENE	SWATER	60	1	0
BENZO(K)FLUORANTHENE	SWATER	60	1	0
BIS(2-CHLOROETHOXY)METHANE	SWATER	60	1	0
BIS(2-CHLOROETHYL)ETHER	SWATER	60	1	0
BIS(2-ETHYLHEXYL)PHTHALATE	SWATER	60	1	0
BUTYLBENZYLPHTHALATE	SWATER	60	1	0
CARBAZOLE	SWATER	60	1	0
CHRYSENE	SWATER	60	1	0
DI-N-BUTYLPHTHALATE	SWATER	60	1	0
DI-N-OCTYLPHTHALATE	SWATER	60	1	0
DIBENZ(A,H)ANTHRACENE	SWATER	60	1	0

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J3"	Number (Percent) of Analytes Rejected as "R3"
DIBENZOFURAN	SWATER	60	1	0
DIETHYLPHTHALATE	SWATER	60	1	0
DIMETHYLPHTHALATE	SWATER	60	1	0
FLUORANTHENE	SWATER	60	1	0
FLUORENE	SWATER	60	1	0
HEXACHLOROBENZENE	SWATER	60	1	0
HEXACHLOROBUTADIENE	SWATER	60	1	0
HEXACHLOROCYCLOPENTADIENE	SWATER	60	1	0
HEXACHLOROETHANE	SWATER	60	1	0
INDENO(1,2,3-CD)PYRENE	SWATER	60	1	0
ISOPHORONE	SWATER	60	1	0
N-NITROSO-DI-N-PROPYLAMINE	SWATER	60	1	0
N-NITROSODIPHENYLAMINE (1)	SWATER	60	1	0
NAPHTHALENE	SWATER	60	1	0
NITROBENZENE	SWATER	60	1	0
PENTACHLOROPHENOL	SWATER	60	1	0
PHENANTHRENE	SWATER	60	1	0
PHENOL	SWATER	60	1	0
PYRENE	SWATER	60	1	0
Total	SWATER	3840	64 (1.67%)	0 (0.00%)
Low Level CLP Semivolatiles				
3,3'-DICHLOROBENZIDINE	SOIL	129	1	0
BENZYL ALCOHOL	SOIL	129	1	0
Total	SOIL	9546	2 (0.02%)	0 (0.00%)
CLP Pesticides/PCBs				
4,4'-DDD	SWATER	60	5	0
4,4'-DDE	SWATER	60	5	0
4,4'-DDT	SWATER	60	5	0
ALDRIN	SWATER	60	5	0
ALPHA-BHC	SWATER	60	5	0

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
ALPHA-CHLORDANE	WATER	60	5	0
AROCLOR-1016	WATER	60	5	0
AROCLOR-1221	WATER	60	5	0
AROCLOR-1232	WATER	60	5	0
AROCLOR-1242	WATER	60	5	0
AROCLOR-1248	WATER	60	5	0
AROCLOR-1254	WATER	60	5	0
AROCLOR-1260	WATER	60	5	0
BETA-BHC	WATER	60	5	0
DELTA-BHC	WATER	60	5	0
DIELDRIN	WATER	60	5	0
ENDOSULFAN I	WATER	60	5	0
ENDOSULFAN II	WATER	60	5	0
ENDOSULFAN SULFATE	WATER	60	5	0
ENDRIN	WATER	60	5	0
ENDRIN ALDEHYDE	WATER	60	5	0
ENDRIN KETONE	WATER	60	5	0
GAMMA-BHC (LINDANE)	WATER	60	5	0
GAMMA-CHLORDANE	WATER	60	5	0
HEPTACHLOR	WATER	60	5	0
HEPTACHLOR EPOXIDE	WATER	60	5	0
METHOXYCHLOR	WATER	60	5	0
TOXAPHENE	WATER	60	5	0
Total	WATER	1680	140 (8.33%)	0 (0.00%)
Low Level CLP Pesticides/PCBs				
2,4'-DDD	SOIL	129	1	0
2,4'-DDE	SOIL	129	1	0
2,4'-DDT	SOIL	129	1	0
4,4'-DDD	SOIL	129	1	0

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J3"	Number (Percent) of Analytes Rejected as "R3"
4,4'-DDE	SOIL	129	1	0
4,4'-DDT	SOIL	129	1	0
ALDRIN	SOIL	129	1	0
ALPHA-CHLORDANE	SOIL	129	1	0
DIELDRIN	SOIL	129	1	0
GAMMA-BHC (LINDANE)	SOIL	129	1	0
HEPTACHLOR	SOIL	129	1	0
HEPTACHLOR EPOXIDE	SOIL	129	1	0
HEXACHLOROBENZENE	SOIL	129	1	0
MIREX	SOIL	129	1	0
PCB-101 (2,2',3,5,5')	SOIL	129	1	0
PCB-105 (2,3,3',4,4')	SOIL	129	1	0
PCB-118 (2,3',4,4',5)	SOIL	129	1	0
PCB-126 (3,3',4,4',5)	SOIL	129	1	0
PCB-128 (2,2',3,3',4,4')	SOIL	129	1	0
PCB-138 (2,2',3,4,4',5')	SOIL	129	1	0
PCB-153 (2,2',4,4',5,5')	SOIL	129	1	0
PCB-170 (2,2',3,3',4,4',5)	SOIL	129	1	0
PCB-18 (2,2',5)	SOIL	129	1	0
PCB-180 (2,2',3,4,4',5,5')	SOIL	129	1	0
PCB-187 (2,2',3,4',5,5',6)	SOIL	129	1	0
PCB-195 (2,2',3,3',4,4',5,6)	SOIL	129	1	0
PCB-206 (2,2,',3,3',4,4',5,5',	SOIL	129	1	0
PCB-209 (2,2',3,3',4,4',5,5',6	SOIL	129	1	0
PCB-28 (2,4,4')	SOIL	129	1	0
PCB-44 (2,2',3,5')	SOIL	129	1	0
PCB-52 (2,2',5,5')	SOIL	129	1	0
PCB-66 (2,3',4,4')	SOIL	129	1	0
PCB-77 (3,3',4,4')	SOIL	129	1	0

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
PCB-8 (2,4')	SOIL	129	1	0
TRANS-NONACHLOR	SOIL	129	1	0
Total	SOIL	4515	35 (0.78%)	0 (0.00%)
Explosives				
1,3,5-TRINITROBENZENE	SWATER	60	1	0
1,3-DINITROBENZENE	SWATER	60	1	0
2,4,6-TRINITROTOLUENE	SWATER	60	1	0
2,4-DINITROTOLUENE	SWATER	60	1	0
2,6-DINITROTOLUENE	SWATER	60	1	0
2-NITROTOLUENE	SWATER	60	1	0
3-NITROTOLUENE	SWATER	60	1	0
4-NITROTOLUENE	SWATER	60	1	0
HMX	SWATER	60	1	0
NITROBENZENE	SWATER	60	1	0
RDX	SWATER	60	1	0
TETRYL	SWATER	60	1	0
Total	SWATER	720	12 (1.67%)	0 (0.00%)
CLP Metals				
MERCURY	SEDIMENT	5	3	0
Total	SEDIMENT	120	3 (2.50%)	0 (0.00%)
MERCURY	SOIL	294	2	0
Total	SOIL	7056	2 (0.03%)	0 (0.00%)
Total Organic Carbon				
TOTAL ORGANIC CARBON	SOIL	228	4	0
Total	SOIL	228	4 (1.75%)	0 (0.00%)
pH				
PH	SOIL	294	1	0
Total	SOIL	294	1 (0.34%)	0 (0.00%)
PH	WATER	3	2	0
Total	WATER	3	2 (66.67%)	0 (0.00%)

TABLE K-3

DATA QUALIFICATION: HOLDING TIME EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
Sulfides				
SULFIDE	SOIL	201	1	0
Total	SOIL	375	1 (0.27%)	0 (0.00%)
Tidal Areas	All	49155	426 (0.87%)	0 (0.00%)

Note: The following analyses had no holding time exceedances: dioxins, CLP metals (except for mercury), TPH-purgeables, TPH-extractables, aromatic volatiles, hexavalent chromium, and sulfides.

TABLE K-4

CALIBRATION REQUIREMENTS

NAVAL WEAPONS STATION CONCORD

Analysis	Calibration Requirements	Detected Data Qualified as "J6" (Estimated)	Nondetected Data Qualified as "J6" (Estimated)	Detected Data Qualified as "J6" (Estimated) and Nondetected Data Qualified as "R6" (Rejected)
CLP volatiles, CLP semivolatiles, low-level CLP semivolatiles, and dioxins	IC: %RSD ≤ 30.0% CC: %D ≤ ± 25.0%	IC: %RSD > 30.0% CC: %D > ± 25.0%	IC: %RSD > 60.0 % CC: %D > 50.0%	RRF < 0.05
CLP pesticides/ polychlorinated biphenyls (PCB) and low-level CLP pesticides/ PCBs	IC: %RSD ≤ 20.0%[a] PEM/CC: %D ≤ ± 25.0%	IC: %RSD > 20.0%[a] PEM/CC: %D > ± 25.0%	IC: %RSD > 40%[a] PEM/CC: %D > 50.0%	N/A
CLP metals, modified WET CLP metals, and hexavalent chromium	IC: r ≥ 0.995 ICV/CCV: 90-110%	IC: r < 0.995 ICV/CCV: > 110% ICV/CCV: < 90%	IC: r < 0.995 ICV/CCV: < 90%	N/A
CLP mercury	IC: r ≥ 0.995 ICV/CCV: 80-120%	IC: r < 0.995 ICV/CCV: > 120% ICV/CCV: < 80%	IC: r < 0.995 ICV/CCV: < 80%	N/A

TABLE K-4

CALIBRATION REQUIREMENTS

NAVAL WEAPONS STATION CONCORD (Continued)

Analysis	Calibration Requirements	Detected Data Qualified as "J6" (Estimated)	Nondetected Data Qualified as "J6" (Estimated)	Detected Data Qualified as "J6" (Estimated) and Nondetected Data Qualified as "R6" (Rejected)
Total petroleum hydrocarbons (TPH)-purgeables, TPH-extractables, aromatic volatiles, and explosives	IC: %RSD ≤ 20.0% CC: %D ≤ ± 15.0%	IC: %RSD > 20.0% CC: %D > ± 15.0%	IC: %RSD > 40.0% CC: %D > ± 30.0%	N/A
Total organic carbon and sulfides	IC: r ≥ 0.995 ICV/CCV: 90-110%	IC: r < 0.995 ICV/CCV: > 110% ICV/CCV: < 90%	IC: r < 0.995 ICV/CCV: < 90%	N/A
pH and total suspended solids	CC: %D ≤ 10.0%	CC: %D > 10.0%	CC: %D > 10.0%	N/A

Notes: [a] IC criteria applies to single peak pesticides only.

Legend:
CLP: Contract Laboratory Program
IC: Initial calibration
%RSD: Percent relative standard deviation
CC: Continuing calibration

TABLE K-4

CALIBRATION REQUIREMENTS

NAVAL WEAPONS STATION CONCORD (Continued)

Notes (Continued):

%D: Percent difference
RRF: Relative response factor
PEM: Performance evaluation mixture
N/A: No calibration criteria were used for the rejection of data
WET: Waste Extraction Test
r: Correlation coefficient
ICV: Initial calibration verification
CCV: Continuing calibration verification

Source: EPA 1990a and EPA 1994; PRC 1994; and the specified analytical methods

TABLE K-5

DATA QUALIFICATION: ORGANIC CALIBRATION EXCEEDANCES
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
CLP Volatiles				
2-BUTANONE	SOIL	100	9	0
ACETONE	SOIL	100	2	0
Total	SOIL	3300	11 (0.33%)	0 (0.00%)
ACETONE	SWATER	60	11	0
BROMOMETHANE	SWATER	60	10	0
Total	SWATER	1980	21 (1.06%)	0 (0.00%)
CLP Semivolatiles				
2,2'-OXYBIS(1-CHLOROPROPANE)	SOIL	101	2	0
2,4-DINITROPHENOL	SOIL	101	2	0
3,3'-DICHLOROBENZIDINE	SOIL	101	5	0
3-NITROANILINE	SOIL	101	3	0
CARBAZOLE	SOIL	101	17	0
HEXACHLOROCYCLOPENTADIENE	SOIL	101	16	0
Total	SOIL	6464	45 (0.70%)	0 (0.00%)
2,4-DINITROPHENOL	SWATER	60	3	0
3,3'-DICHLOROBENZIDINE	SWATER	60	13	0
4-CHLOROANILINE	SWATER	60	4	0
HEXACHLOROCYCLOPENTADIENE	SWATER	60	7	0
Total	SWATER	3840	27 (0.70%)	0 (0.00%)
Low Level CLP Semivolatiles				
HEXACHLOROCYCLOPENTADIENE	SEDIMENT	5	3	0
Total	SEDIMENT	370	3 (0.81%)	0 (0.00%)
2,4-DINITROPHENOL	SOIL	129	0	3
3,3'-DICHLOROBENZIDINE	SOIL	129	5	0
3-NITROANILINE	SOIL	129	6	0
4,6-DINITRO-2-METHYLPHENOL	SOIL	129	0	1
4-NITROANILINE	SOIL	129	6	0
4-NITROPHENOL	SOIL	129	7	0
BENZO(K)FLUORANTHENE	SOIL	129	1	0
BENZOIC ACID	SOIL	129	28	0
BENZYL ALCOHOL	SOIL	129	5	0

TABLE K-5

DATA QUALIFICATION: ORGANIC CALIBRATION EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J&"	Number (Percent) of Analytes Rejected as "R&"
FLUORANTHENE	SOIL	129	5	0
HEXACHLOROCYCLOPENTADIENE	SOIL	129	35	15
NITROBENZENE	SOIL	129	1	0
PENTACHLOROPHENOL	SOIL	129	1	17
Total	SOIL	9546	100 (1.05%)	36 (0.38%)
Low Level CLP Pesticides/PCBs:				
HEPTACHLOR EPOXIDE	SEDIMENT	5	3	0
PCB-44 (2,2',3,5')	SEDIMENT	5	3	0
PCB-8 (2,4')	SEDIMENT	5	2	0
Total	SEDIMENT	175	8 (4.57%)	0 (0.00%)
HEPTACHLOR EPOXIDE	SOIL	129	12	0
MIREX	SOIL	129	3	0
PCB-126 (3,3',4,4',5)	SOIL	129	4	0
PCB-195 (2,2',3,3',4,4',5,6)	SOIL	129	3	0
PCB-209 (2,2',3,3',4,4',5,5',6	SOIL	129	3	0
PCB-44 (2,2',3,5')	SOIL	129	18	0
PCB-8 (2,4')	SOIL	129	2	0
Total	SOIL	4515	45 (1.00%)	0 (0.00%)
Tidal Areas	All	36659	260 (0.71%)	36 (0.10%)

Note: The following analyses had no calibration exceedances: CLP pesticides/PCBs, aromatic volatiles, TPH-purgeables, TPH-extractables, dioxins, and explosives.

TABLE K-6
EQUIPMENT BLANK SUMMARY TABLE
NAVAL WEAPONS STATION CONCORD

Analysis	Analyte	Minimum Value	Maximum Value	Median Value	Unit	Frequency of Detection
TMETAL	ALUMINUM	18.9	42.2	35.4	UG/L	5/22
TMETAL	ARSENIC	1.5	2.4	1.95	UG/L	2/22
TMETAL	BARIUM	0.89	0.89	0.89	UG/L	1/22
TMETAL	CALCIUM	65.3	107	94	UG/L	5/22
TMETAL	COPPER	0.65	1.2	1	UG/L	3/22
TMETAL	IRON	18.5	149	53.9	UG/L	5/22
TMETAL	LEAD	1.3	1.3	1.3	UG/L	1/22
TMETAL	MAGNESIUM	19.9	56.5	38.4	UG/L	5/22
TMETAL	MANGANESE	0.38	2.4	1.2	UG/L	3/22
TMETAL	MOLYBDENUM	0.86	1.4	1.13	UG/L	2/22
TMETAL	NICKEL	2.9	3.4	3.15	UG/L	2/22
TMETAL	SODIUM	161	199	180	UG/L	2/22
TMETAL	ZINC	18.5	47.3	33.9	UG/L	5/22
TOC	TOTAL ORGANIC CARBON	0.5	0.7	0.6	MG/L	3/22

Notes: An equipment rinsate blank is collected after a sample collection device is subject to decontamination procedures. Analyte-free water is poured over or through the sampling device, collected in the appropriate sample containers and analyzed for the same parameters as the samples collected during the sampling event. Equipment rinsate blanks are used to verify the effectiveness of sampling equipment decontamination procedures.

Only analyses that were detected appear in the table.

TABLE K-7

DATA QUALIFICATION: BLANK CONTAMINATION
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Reported as "U"	Number (Percent) of Analytes Reported as "B"
CLP Volatiles:				
2-BUTANONE	SOIL	100	18	0
ACETONE	SOIL	100	85	8
CARBON DISULFIDE	SOIL	100	7	0
METHYLENE CHLORIDE	SOIL	100	54	0
Total	SOIL	3300	164 (4.97%)	8 (0.24%)
ACETONE	SWATER	60	11	0
Total	SWATER	1980	11 (0.56%)	0 (0.00%)
ACETONE	WATER	2	2	0
Total	WATER	66	2 (3.03%)	0 (0.00%)
CLP Semivolatiles:				
BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	101	4	0
Total	SOIL	6464	4 (0.06%)	0 (0.00%)
BIS(2-ETHYLHEXYL)PHTHALATE	SWATER	60	8	0
Total	SWATER	3840	8 (0.21%)	0 (0.00%)
DIETHYLPHTHALATE	WATER	2	1	0
Total	WATER	128	1 (0.78%)	0 (0.00%)
Low Level CLP Semivolatiles:				
BIS(2-ETHYLHEXYL)PHTHALATE	SEDIMENT	5	2	0
DI-N-BUTYLPHTHALATE	SEDIMENT	5	2	0
Total	SEDIMENT	370	4 (1.08%)	0 (0.00%)
BENZO(A)ANTHRACENE	SOIL	129	9	0
BENZO(A)PYRENE	SOIL	129	10	0
BENZO(B)FLUORANTHENE	SOIL	129	11	0
BENZO(G,H,I)PERYLENE	SOIL	129	9	0
BENZO(K)FLUORANTHENE	SOIL	129	9	0
BENZOIC ACID	SOIL	129	2	0
BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	129	56	1
BUTYLBENZYLPHTHALATE	SOIL	129	5	0
CHRYSENE	SOIL	129	10	0
DI-N-BUTYLPHTHALATE	SOIL	129	86	0
DIBENZ(A,H)ANTHRACENE	SOIL	129	6	0
DIETHYLPHTHALATE	SOIL	129	12	0

TABLE K-7

DATA QUALIFICATION: BLANK CONTAMINATION (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Reported as "U"	Number (Percent) of Analytes Reported as "UJ"
INDENO(1,2,3-CD)PYRENE	SOIL	129	8	0
PERYLENE	SOIL	129	6	0
PHENOL	SOIL	129	2	0
Total	SOIL	9546	241 (2.52%)	1 (0.01%)
Low Level CLP Pesticides/PCBs				
PCB-138 (2,2',3,4,4',5')	SEDIMENT	5	3	0
Total	SEDIMENT	175	3 (1.71%)	0 (0.00%)
2,4'-DDD	SOIL	129	1	0
4,4'-DDD	SOIL	129	6	0
4,4'-DDT	SOIL	129	5	0
HEPTACHLOR	SOIL	129	10	0
PCB-138 (2,2',3,4,4',5')	SOIL	129	1	0
PCB-18 (2,2',5)	SOIL	129	7	0
PCB-187 (2,2',3,4',5,5',6)	SOIL	129	4	0
PCB-209 (2,2',3,3',4,4',5,5',6	SOIL	129	2	0
PCB-44 (2,2',3,5')	SOIL	129	1	0
PCB-8 (2,4')	SOIL	129	5	0
Total	SOIL	4515	42 (0.93%)	0 (0.00%)
CLP Metals				
ANTIMONY	SEDIMENT	5	2	0
SILVER	SEDIMENT	5	1	0
Total	SEDIMENT	120	3 (2.50%)	0 (0.00%)
ANTIMONY	SOIL	294	38	9
ARSENIC	SOIL	294	7	6
BERYLLIUM	SOIL	294	71	2
CADMIUM	SOIL	294	13	1
CHROMIUM	SOIL	294	10	0
COBALT	SOIL	294	2	0
COPPER	SOIL	294	2	2
LEAD	SOIL	294	5	0
MERCURY	SOIL	294	27	5

TABLE K-7

DATA QUALIFICATION: BLANK CONTAMINATION (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Reported as "U"	Number (Percent) of Analytes Reported as "B"
MOLYBDENUM	SOIL	294	55	12
NICKEL	SOIL	294	2	0
SELENIUM	SOIL	294	13	0
SILVER	SOIL	294	11	0
SODIUM	SOIL	294	11	2
THALLIUM	SOIL	294	10	0
ZINC	SOIL	294	5	8
Total	SOIL	7056	282 (4.00%)	47 (0.67%)
ALUMINUM	SWATER	60	14	0
ANTIMONY	SWATER	60	14	0
ARSENIC	SWATER	60	12	0
BERYLLIUM	SWATER	60	10	0
CADMIUM	SWATER	60	11	0
CHROMIUM	SWATER	60	11	0
COBALT	SWATER	60	14	0
COPPER	SWATER	60	16	0
LEAD	SWATER	60	16	0
MERCURY	SWATER	60	2	0
MOLYBDENUM	SWATER	60	29	0
NICKEL	SWATER	60	8	0
SELENIUM	SWATER	60	4	0
SILVER	SWATER	60	2	0
THALLIUM	SWATER	60	3	0
VANADIUM	SWATER	60	32	0
ZINC	SWATER	60	35	0
Total	SWATER	1440	233 (16.18%)	0 (0.00%)
BERYLLIUM	WATER	2	1	0
Total	WATER	49	1 (2.04%)	0 (0.00%)

TABLE K-7

DATA QUALIFICATION: BLANK CONTAMINATION (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Reported as "U1"	Number (Percent) of Analytes Reported as "U2"
WET Acid CLP Metals:				
ANTIMONY	SEDIMENT	5	2	0
ARSENIC	SEDIMENT	5	2	0
MERCURY	SEDIMENT	5	1	0
SELENIUM	SEDIMENT	5	1	0
Total	SEDIMENT	120	6 (5.00%)	0 (0.00%)
ANTIMONY	SOIL	15	6	0
BERYLLIUM	SOIL	15	1	0
Total	SOIL	360	7 (1.94%)	0 (0.00%)
WET CLP Metals:				
ANTIMONY	SEDIMENT	5	2	0
ARSENIC	SEDIMENT	5	2	0
BERYLLIUM	SEDIMENT	5	2	0
CADMIUM	SEDIMENT	5	2	0
CHROMIUM	SEDIMENT	5	2	0
MERCURY	SEDIMENT	5	1	0
SELENIUM	SEDIMENT	5	1	0
ZINC	SEDIMENT	5	2	0
Total	SEDIMENT	120	14 (11.67%)	0 (0.00%)
ALUMINUM	SOIL	47	4	0
ANTIMONY	SOIL	47	9	0
BERYLLIUM	SOIL	47	3	0
CADMIUM	SOIL	47	12	0
CHROMIUM	SOIL	47	18	0
COBALT	SOIL	47	2	0
COPPER	SOIL	47	4	0
IRON	SOIL	47	3	0
LEAD	SOIL	47	6	0
MANGANESE	SOIL	47	2	0
MERCURY	SOIL	47	2	0

TABLE K-7

DATA QUALIFICATION: BLANK CONTAMINATION (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Reported as "U"	Number (Percent) of Analytes Reported as "J"
MOLYBDENUM	SOIL	47	20	0
NICKEL	SOIL	47	8	0
SELENIUM	SOIL	47	1	0
SILVER	SOIL	47	8	0
ZINC	SOIL	47	9	0
Total	SOIL	1128	111 (9.84%)	0 (0.00%)
Tidal Areas	All	49155	1137 (2.31%)	56 (0.11%)

Note: The following analyses had no detection or quantitation limits affected by blank contamination: CLP pesticides/PCBs, TPH-purgeables, TPH-extractables, dioxins, aromatic volatiles, hexavalent chromium, TOC, pH, sulfides, and explosives.

TABLE K-8

ACCURACY REQUIREMENTS

NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Accuracy Requirements	Detected Data Qualified as "J4" (Estimated)	Detected and Nondetected Data Qualified as "J4" (Estimated)	Detected Data Qualified as "J4" (Estimated) and Nondetected Data Qualified as "R4" (Rejected)
CLP volatiles	Water	SMC1: 88-110% SMC2: 86-115% SMC3: 76-114%	SMC1: > 110% SMC2: > 115% SMC3: > 114%	SMC1: < 88% SMC2: < 86% SMC3: < 76%	Any SMC: < 10%
	Soil	SMC1: 84-138% SMC2: 59-113% SMC3: 70-121%	SMC1: > 138% SMC2: > 113% SMC3: > 121%	SMC1: < 84% SMC2: < 59% SMC3: < 70%	
CLP semivolatiles and low-level CLP semivolatiles	Water	SMC1: 35-114% SMC2: 43-116% SMC3: 33-141% SMC4: 10-110% SMC5: 21-110% SMC6: 10-123% SMC7: 33-110% SMC8: 16-110%	SMC1: > 114% SMC2: > 116% SMC3: > 141% SMC4: > 110% SMC5: > 110% SMC6: > 123% SMC7: > 110% SMC8: > 110%	SMC1: < 35% SMC2: < 43% SMC3: < 33% SMC4: < 10% SMC5: < 21% SMC6: < 10% SMC7: < 33% SMC8: < 16%	Any SMC: < 10%

TABLE K-8

ACCURACY REQUIREMENTS

NAVAL WEAPONS STATION CONCORD (Continued)

Analysis	Matrix	Accuracy Requirements	Detected Data Qualified as "J4" (Estimated)	Detected and Nondetected Data Qualified as "J4" (Estimated)	Detected Data Qualified as "J4" (Estimated) and Nondetected Data Qualified as "R4" (Rejected)
CLP semivolatiles and low-level CLP semivolatiles	Soil	SMC1: 23-120% SMC2: 30-115% SMC3: 18-137% SMC4: 24-113% SMC5: 25-121% SMC6: 19-122% SMC7: 20-130% SMC8: 20-130%	SMC1: > 120% SMC2: > 115% SMC3: > 137% SMC4: > 113% SMC5: > 121% SMC6: > 122% SMC7: > 130% SMC8: > 130%	SMC1: < 23% SMC2: < 30% SMC3: < 18% SMC4: < 24% SMC5: < 25% SMC6: < 19% SMC7: < 20% SMC8: < 20%	Any SMC: < 10%
CLP pesticides/ polychlorinated biphenyls (PCB), and low-level CLP pesticides/PCBs	Water, soil, or sediment	TCX: 60-150% DCB: 60-150%	TCX or DCB: > 150% (two or more surrogates)	TCX or DCB: < 60% (two or more surrogates)	TCX or DCB: < 10% (one or more surrogates)
Total petroleum hydrocarbons-extractables and explosives	Soil or water	SMC: 60-140%	SMC: > 140%	SMC: < 60%	SMC: < 10%

TABLE K-8

ACCURACY REQUIREMENTS

NAVAL WEAPONS STATION CONCORD (Continued)

Analysis	Matrix	Accuracy Requirements	Detected Data Qualified as "J4" (Estimated)	Detected and Nondetected Data Qualified as "J4" (Estimated)	Detected Data Qualified as "J4" (Estimated) and Nondetected Data Qualified as "R4" (Rejected)
Total petroleum hydrocarbons-purgeables and aromatic volatiles	Soil or water	SMC: 75-125%	SMC: > 125%	SMC: < 75%	SMC: < 10%
CLP metals, hexavalent chromium, total organic carbon, pH, total suspended solids, and sulfides	Water, soil, or sediment	LCS: 80-120%[a] MS: 75-125%[a]	LCS: > 120% MS: > 125%	LCS: < 80% MS: < 75%	LCS: < 50% MS: < 30%

Notes:
[a] LCS and MS recoveries outside accuracy requirements apply to all samples in the sample delivery group.

CLP: Contract Laboratory Program
SMC: System monitoring compound
TCX: Tetrachloro-m-xylene
DCB: Decachlorobiphenyl
LCS: Laboratory control sample
MS: Matrix spike

Source: EPA 1990a; EPA 1994; PRC 1994; and the specified analytical methods

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J4"	Number (Percent) of Analytes Rejected as "R4"
CLP Volatiles:				
1,1,1-TRICHLOROETHANE	SWATER	60	1	0
1,1,2,2-TETRACHLOROETHANE	SWATER	60	1	0
1,1,2-TRICHLOROETHANE	SWATER	60	1	0
1,1-DICHLOROETHANE	SWATER	60	1	0
1,1-DICHLOROETHENE	SWATER	60	1	0
1,2-DICHLOROETHANE	SWATER	60	1	0
1,2-DICHLOROETHENE (TOTAL)	SWATER	60	1	0
1,2-DICHLOROPROPANE	SWATER	60	1	0
2-BUTANONE	SWATER	60	1	0
2-HEXANONE	SWATER	60	1	0
4-METHYL-2-PENTANONE	SWATER	60	1	0
ACETONE	SWATER	60	1	0
BENZENE	SWATER	60	1	0
BROMODICHLOROMETHANE	SWATER	60	1	0
BROMOFORM	SWATER	60	1	0
BROMOMETHANE	SWATER	60	1	0
CARBON DISULFIDE	SWATER	60	2	0
CARBON TETRACHLORIDE	SWATER	60	1	0
CHLOROBENZENE	SWATER	60	1	0
CHLOROETHANE	SWATER	60	1	0
CHLOROFORM	SWATER	60	1	0
CHLOROMETHANE	SWATER	60	1	0
CIS-1,3-DICHLOROPROPENE	SWATER	60	1	0
DIBROMOCHLOROMETHANE	SWATER	60	1	0
ETHYLBENZENE	SWATER	60	1	0
METHYLENE CHLORIDE	SWATER	60	1	0
STYRENE	SWATER	60	1	0
TETRACHLOROETHENE	SWATER	60	1	0

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J4"	Number (Percent) of Analytes Rejected as "R4"
TOLUENE	SWATER	60	1	0
TRANS-1,3-DICHLOROPROPENE	SWATER	60	1	0
TRICHLOROETHENE	SWATER	60	1	0
VINYL CHLORIDE	SWATER	60	1	0
XYLENE (TOTAL)	SWATER	60	1	0
Total	SWATER	1980	34 (1.72%)	0 (0.00%)
CLP Semivolatiles:				
1,2,4-TRICHLOROBENZENE	SOIL	101	0	1
1,2-DICHLOROBENZENE	SOIL	101	0	1
1,3-DICHLOROBENZENE	SOIL	101	0	1
1,4-DICHLOROBENZENE	SOIL	101	0	1
2,2'-OXYBIS(1-CHLOROPROPANE)	SOIL	101	0	1
2,4-DINITROTOLUENE	SOIL	101	0	1
2,6-DINITROTOLUENE	SOIL	101	0	1
2-CHLORONAPHTHALENE	SOIL	101	0	1
2-METHYLNAPHTHALENE	SOIL	101	0	1
2-NITROANILINE	SOIL	101	0	1
3,3'-DICHLOROBENZIDINE	SOIL	101	0	1
3-NITROANILINE	SOIL	101	0	1
4-BROMOPHENYL-PHENYLETHER	SOIL	101	0	1
4-CHLOROANILINE	SOIL	101	0	1
4-CHLOROPHENYL-PHENYLETHER	SOIL	101	0	1
4-NITROANILINE	SOIL	101	0	1
4-NITROPHENOL	SOIL	101	0	1
ACENAPHTHENE	SOIL	101	0	1
ACENAPHTHYLENE	SOIL	101	0	1
ANTHRACENE	SOIL	101	0	1
BENZO(A)ANTHRACENE	SOIL	101	0	1
BENZO(A)PYRENE	SOIL	101	0	1

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
BENZO(B)FLUORANTHENE	SOIL	101	0	1
BENZO(G,H,I)PERYLENE	SOIL	101	0	1
BENZO(K)FLUORANTHENE	SOIL	101	0	1
BIS(2-CHLOROETHOXY)METHANE	SOIL	101	0	1
BIS(2-CHLOROETHYL)ETHER	SOIL	101	0	1
BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	101	0	1
BUTYLBENZYLPHTHALATE	SOIL	101	0	1
CARBAZOLE	SOIL	101	0	1
CHRYSENE	SOIL	101	0	1
DI-N-BUTYLPHTHALATE	SOIL	101	0	1
DI-N-OCTYLPHTHALATE	SOIL	101	0	1
DIBENZ(A,H)ANTHRACENE	SOIL	101	0	1
DIBENZOFURAN	SOIL	101	0	1
DIETHYLPHTHALATE	SOIL	101	0	1
DIMETHYLPHTHALATE	SOIL	101	0	1
FLUORANTHENE	SOIL	101	0	1
FLUORENE	SOIL	101	0	1
HEXACHLOROBENZENE	SOIL	101	0	1
HEXACHLOROBUTADIENE	SOIL	101	0	1
HEXACHLOROCYCLOPENTADIENE	SOIL	101	0	1
HEXACHLOROETHANE	SOIL	101	0	1
INDENO(1,2,3-CD)PYRENE	SOIL	101	0	1
ISOPHORONE	SOIL	101	0	1
N-NITROSO-DI-N-PROPYLAMINE	SOIL	101	0	1
N-NITROSODIPHENYLAMINE (1)	SOIL	101	0	1
NAPHTHALENE	SOIL	101	0	1
NITROBENZENE	SOIL	101	0	1
PHENANTHRENE	SOIL	101	0	1
PYRENE	SOIL	101	0	1

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
Total	SOIL	6464	0 (0.00%)	51 (0.79%)
Low Level CLP Semivolatiles:				
4-NITROPHENOL	SOIL	129	0	1
BENZOIC ACID	SOIL	129	2	0
HEXACHLOROCYCLOPENTADIENE	SOIL	129	2	0
PENTACHLOROPHENOL	SOIL	129	1	1
Total	SOIL	9546	5 (0.05%)	2 (0.02%)
CLP Pesticides/PCBs:				
4,4'-DDT	SOIL	100	11	0
ALDRIN	SOIL	100	11	0
DIELDRIN	SOIL	100	11	0
ENDRIN	SOIL	100	11	0
GAMMA-BHC (LINDANE)	SOIL	100	11	0
HEPTACHLOR	SOIL	100	11	0
Total	SOIL	2800	66 (2.36%)	0 (0.00%)
4,4'-DDD	WATER	60	3	0
4,4'-DDE	WATER	60	3	0
4,4'-DDT	WATER	60	3	0
ALDRIN	WATER	60	3	0
ALPHA-BHC	WATER	60	3	0
ALPHA-CHLORDANE	WATER	60	3	0
AROCLOR-1016	WATER	60	3	0
AROCLOR-1221	WATER	60	3	0
AROCLOR-1232	WATER	60	3	0
AROCLOR-1242	WATER	60	3	0
AROCLOR-1248	WATER	60	3	0
AROCLOR-1254	WATER	60	3	0
AROCLOR-1260	WATER	60	3	0
BETA-BHC	WATER	60	3	0
DELTA-BHC	WATER	60	3	0

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
DIELDRIN	WATER	60	3	0
ENDOSULFAN I	WATER	60	3	0
ENDOSULFAN II	WATER	60	3	0
ENDOSULFAN SULFATE	WATER	60	3	0
ENDRIN	WATER	60	3	0
ENDRIN ALDEHYDE	WATER	60	3	0
ENDRIN KETONE	WATER	60	3	0
GAMMA-BHC (LINDANE)	WATER	60	3	0
GAMMA-CHLORDANE	WATER	60	3	0
HEPTACHLOR	WATER	60	3	0
HEPTACHLOR EPOXIDE	WATER	60	3	0
METHOXYCHLOR	WATER	60	3	0
TOXAPHENE	WATER	60	3	0
Total	WATER	1680	84 (5.00%)	0 (0.00%)
Low Level CLP Pesticides/PCBs				
2,4'-DDD	SEDIMENT	5	2	0
2,4'-DDE	SEDIMENT	5	2	0
2,4'-DDT	SEDIMENT	5	2	0
4,4'-DDD	SEDIMENT	5	2	0
4,4'-DDE	SEDIMENT	5	2	0
4,4'-DDT	SEDIMENT	5	2	0
ALDRIN	SEDIMENT	5	1	0
ALPHA-CHLORDANE	SEDIMENT	5	2	0
DIELDRIN	SEDIMENT	5	2	0
GAMMA-BHC (LINDANE)	SEDIMENT	5	1	0
HEPTACHLOR	SEDIMENT	5	1	0
HEPTACHLOR EPOXIDE	SEDIMENT	5	1	0
HEXACHLOROBENZENE	SEDIMENT	5	2	0
MIREX	SEDIMENT	5	2	0

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J4"	Number (Percent) of Analytes Rejected as "R4"
PCB-101 (2,2',3,5,5')	SEDIMENT	5	2	0
PCB-105 (2,3,3',4,4')	SEDIMENT	5	2	0
PCB-118 (2,3',4,4',5)	SEDIMENT	5	2	0
PCB-126 (3,3',4,4',5)	SEDIMENT	5	2	0
PCB-128 (2,2',3,3',4,4')	SEDIMENT	5	2	0
PCB-153 (2,2',4,4',5,5')	SEDIMENT	5	2	0
PCB-170 (2,2',3,3',4,4',5)	SEDIMENT	5	2	0
PCB-18 (2,2',5)	SEDIMENT	5	1	0
PCB-180 (2,2',3,4,4',5,5')	SEDIMENT	5	2	0
PCB-187 (2,2',3,4',5,5',6)	SEDIMENT	5	2	0
PCB-195 (2,2',3,3',4,4',5,6)	SEDIMENT	5	2	0
PCB-206 (2,2,',3,3',4,4',5,5',	SEDIMENT	5	2	0
PCB-209 (2,2',3,3',4,4',5,5',6	SEDIMENT	5	2	0
PCB-28 (2,4,4')	SEDIMENT	5	1	0
PCB-44 (2,2',3,5')	SEDIMENT	5	1	0
PCB-52 (2,2',5,5')	SEDIMENT	5	1	0
PCB-66 (2,3',4,4')	SEDIMENT	5	2	0
PCB-77 (3,3',4,4')	SEDIMENT	5	1	0
PCB-8 (2,4')	SEDIMENT	5	1	0
TRANS-NONACHLOR	SEDIMENT	5	2	0
Total	SEDIMENT	175	58 (33.14%)	0 (0.00%)
2,4'-DDD	SOIL	129	15	0
2,4'-DDE	SOIL	129	15	0
2,4'-DDT	SOIL	129	15	0
4,4'-DDD	SOIL	129	15	0
4,4'-DDE	SOIL	129	15	0
4,4'-DDT	SOIL	129	20	0
ALDRIN	SOIL	129	15	0
ALPHA-CHLORDANE	SOIL	129	15	0

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J4"	Number (Percent) of Analytes Rejected as "R4"
DIELDRIN	SOIL	129	15	0
GAMMA-BHC (LINDANE)	SOIL	129	15	0
HEPTACHLOR	SOIL	129	14	0
HEPTACHLOR EPOXIDE	SOIL	129	16	0
HEXACHLOROBENZENE	SOIL	129	16	0
MIREX	SOIL	129	18	0
PCB-101 (2,2',3,5,5')	SOIL	129	21	0
PCB-105 (2,3,3',4,4')	SOIL	129	21	0
PCB-118 (2,3',4,4',5)	SOIL	129	21	0
PCB-126 (3,3',4,4',5)	SOIL	129	22	0
PCB-128 (2,2',3,3',4,4')	SOIL	129	21	0
PCB-138 (2,2',3,4,4',5')	SOIL	129	21	0
PCB-153 (2,2',4,4',5,5')	SOIL	129	21	0
PCB-170 (2,2',3,3',4,4',5)	SOIL	129	21	0
PCB-18 (2,2',5)	SOIL	129	20	0
PCB-180 (2,2',3,4,4',5,5')	SOIL	129	21	0
PCB-187 (2,2',3,4',5,5',6)	SOIL	129	21	0
PCB-195 (2,2',3,3',4,4',5,6)	SOIL	129	22	0
PCB-206 (2,2,',3,3',4,4',5,5',	SOIL	129	21	0
PCB-209 (2,2',3,3',4,4',5,5',6	SOIL	129	21	0
PCB-28 (2,4,4')	SOIL	129	21	0
PCB-44 (2,2',3,5')	SOIL	129	21	0
PCB-52 (2,2',5,5')	SOIL	129	20	0
PCB-66 (2,3',4,4')	SOIL	129	21	0
PCB-77 (3,3',4,4')	SOIL	129	20	0
PCB-8 (2,4')	SOIL	129	20	0
TRANS-NONACHLOR	SOIL	129	16	0
Total	SOIL	4515	653 (14.46%)	0 (0.00%)

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J4"	Number (Percent) of Analytes Rejected as "R4"
Explosives:				
2-NITROTOLUENE	SOIL	77	3	0
4-NITROTOLUENE	SOIL	77	3	0
TETRYL	SOIL	77	7	14
Total	SOIL	924	13 (1.41%)	14 (1.52%)
1,3,5-TRINITROBENZENE	SWATER	60	4	0
1,3-DINITROBENZENE	SWATER	60	3	0
2,4,6-TRINITROTOLUENE	SWATER	60	5	0
2,4-DINITROTOLUENE	SWATER	60	3	0
2,6-DINITROTOLUENE	SWATER	60	3	0
2-NITROTOLUENE	SWATER	60	4	0
3-NITROTOLUENE	SWATER	60	4	0
4-NITROTOLUENE	SWATER	60	4	0
HMX	SWATER	60	3	0
NITROBENZENE	SWATER	60	3	0
RDX	SWATER	60	7	0
TETRYL	SWATER	60	16	2
Total	SWATER	720	59 (8.19%)	2 (0.28%)
1,3,5-TRINITROBENZENE	WATER	2	0	1
1,3-DINITROBENZENE	WATER	2	0	1
2,4,6-TRINITROTOLUENE	WATER	2	0	1
2,4-DINITROTOLUENE	WATER	2	0	1
2,6-DINITROTOLUENE	WATER	2	0	1
2-NITROTOLUENE	WATER	2	0	1
3-NITROTOLUENE	WATER	2	0	1
4-NITROTOLUENE	WATER	2	0	1
HMX	WATER	2	0	1
NITROBENZENE	WATER	2	0	1
RDX	WATER	2	0	1
TETRYL	WATER	2	0	1

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
Total	WATER	24	0 (0.00%)	12 (50.00%)
TPH-Extractables				
DIESEL	WATER	5	1	0
MOTOR OIL	WATER	5	1	0
Total	WATER	10	2 (20.00%)	0 (0.00%)
CLP Metals				
ANTIMONY	SEDIMENT	5	2	0
BARIUM	SEDIMENT	5	2	0
THALLIUM	SEDIMENT	5	2	0
ZINC	SEDIMENT	5	2	0
Total	SEDIMENT	120	8 (6.67%)	0 (0.00%)
ANTIMONY	SOIL	294	216	25
BARIUM	SOIL	294	18	0
CHROMIUM	SOIL	294	20	0
LEAD	SOIL	294	74	0
MANGANESE	SOIL	294	35	0
MERCURY	SOIL	294	16	1
THALLIUM	SOIL	294	20	0
ZINC	SOIL	294	18	0
Total	SOIL	7056	417 (5.91%)	26 (0.37%)
WET Acid CLP Metals				
MERCURY	SEDIMENT	5	2	0
SELENIUM	SEDIMENT	5	0	3
Total	SEDIMENT	120	2 (1.67%)	3 (2.50%)
ALUMINUM	SOIL	15	1	0
ARSENIC	SOIL	15	4	0
BERYLLIUM	SOIL	15	4	0
CADMIUM	SOIL	15	4	0
CHROMIUM	SOIL	15	4	0
COBALT	SOIL	15	4	0
LEAD	SOIL	15	4	0

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"
NICKEL	SOIL	15	4	0
SELENIUM	SOIL	15	4	0
ZINC	SOIL	15	4	0
Total	SOIL	360	37 (10.28%)	0 (0.00%)
WET CLP Metals				
ALUMINUM	SOIL	47	16	0
ARSENIC	SOIL	47	3	0
BARIUM	SOIL	47	5	0
COBALT	SOIL	47	4	0
COPPER	SOIL	47	4	0
IRON	SOIL	47	18	0
LEAD	SOIL	47	3	0
MANGANESE	SOIL	47	5	0
MERCURY	SOIL	47	1	0
NICKEL	SOIL	47	5	0
SELENIUM	SOIL	47	1	0
SILVER	SOIL	47	3	0
VANADIUM	SOIL	47	4	0
ZINC	SOIL	47	3	0
Total	SOIL	1128	75 (6.65%)	0 (0.00%)
Hexavalent Chromium				
HEXAVALENT CHROMIUM	SOIL	50	15	34
Total	SOIL	50	15 (30.00%)	34 (68.00%)
Total Organic Carbons				
TOTAL ORGANIC CARBON	SOIL	228	14	0
Total	SOIL	228	14 (6.14%)	0 (0.00%)
Sulfides				
SULFIDE	SEDIMENT	5	5	0
Total	SEDIMENT	10	5 (50.00%)	0 (0.00%)

TABLE K-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J4"	Number (Percent) of Analytes Rejected as "R4"
SULFIDE	SOIL	201	92	23
Total	SOIL	375	92 (24.53%)	23 (6.13%)
Tidal Areas	All	49155	1639 (3.33%)	167 (0.34%)

Note: The following analyses had no accuracy exceedances: dioxins, TPH-purgeables, pH, and aromatic volatiles.

TABLE K-10

DATA QUALIFICATION: LABORATORY PRECISION EXCEEDANCES NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"
Low Level CLP Pesticides/PCBs:			
4,4'-DDD	SOIL	129	1
Total	SOIL	4515	1 (0.02%)
CLP Metals:			
ALUMINUM	SOIL	294	18
ARSENIC	SOIL	294	11
CALCIUM	SOIL	294	13
CHROMIUM	SOIL	294	12
COPPER	SOIL	294	11
IRON	SOIL	294	17
LEAD	SOIL	294	38
MANGANESE	SOIL	294	25
MERCURY	SOIL	294	8
MOLYBDENUM	SOIL	294	18
Total	SOIL	7056	171 (2.42%)
ZINC	SWATER	60	8
Total	SWATER	1440	8 (0.56%)
ZINC	WATER	2	2
Total	WATER	49	2 (4.08%)
WET Acid CLP Metals:			
THALLIUM	SOIL	15	2
Total	SOIL	360	2 (0.56%)
WET CLP Metals:			
ALUMINUM	SEDIMENT	5	5
BARIUM	SEDIMENT	5	3
CALCIUM	SEDIMENT	5	3
IRON	SEDIMENT	5	5
LEAD	SEDIMENT	5	3
MAGNESIUM	SEDIMENT	5	3
MANGANESE	SEDIMENT	5	5
POTASSIUM	SEDIMENT	5	3
Total	SEDIMENT	120	30 (25.00%)

TABLE K-10

DATA QUALIFICATION: LABORATORY PRECISION EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J5"
ALUMINUM	SOIL	47	22
BARIUM	SOIL	47	1
CALCIUM	SOIL	47	1
IRON	SOIL	47	21
LEAD	SOIL	47	1
MAGNESIUM	SOIL	47	1
MANGANESE	SOIL	47	4
MERCURY	SOIL	47	4
POTASSIUM	SOIL	47	1
ZINC	SOIL	47	1
Total	SOIL	1128	57 (5.05%)
Total Organic Carbon:			
TOTAL ORGANIC CARBON	SOIL	228	53
Total	SOIL	228	53 (23.25%)
Tidal Areas	All	49155	324 (0.66%)

Note: This qualification applies only to CLP metals, CLP WET metals, hexavalent chromium, pH, TOC, and sulfides. Hexavalent chromium, pH, and sulfides did not have any laboratory precision exceedances.

TABLE K-11
FIELD DUPLICATE SUMMARY TABLE
NAVAL WEAPONS STATION CONCORD

ANALYSIS	ANALYTE	ORIGINAL RESULT (28TRADSW003)	QUAL	UNIT	DUPLICATE RESULT (28TRADSW004)	QUAL	UNIT	RPD
SOLIDS	TOTAL SUSPENDED SOLIDS	10		MG/L	10	U	MG/L	0.0
TMETAL	ALUMINUM	393		UG/L	385		UG/L	2.1
TMETAL	BARIUM	48.8		UG/L	48.7		UG/L	0.2
TMETAL	CALCIUM	39000		UG/L	38500		UG/L	1.3
TMETAL	COBALT	0.51		UG/L	0.5	U	UG/L	2.0
TMETAL	COPPER	6.7	U	UG/L	11.4		UG/L	51.9
TMETAL	IRON	777		UG/L	774		UG/L	0.4
TMETAL	MAGNESIUM	100000		UG/L	99100		UG/L	0.9
TMETAL	MANGANESE	105		UG/L	106		UG/L	0.9
TMETAL	POTASSIUM	30200		UG/L	30500		UG/L	1.0
TMETAL	SODIUM	810000		UG/L	802000		UG/L	1.0
TOC	TOTAL ORGANIC CARBON	5.2		MG/L	5.2		MG/L	0.0

Notes: QUAL = Qualifier, U = Nondetected, J = Estimated, R = Rejected, RPD = Relative Percent Difference
MG/L = Milligrams per liter, UG/L = Micrograms per liter

Only analyses that were detected appear in the table.

TABLE K-11
FIELD DUPLICATE SUMMARY TABLE (CONTINUED)
NAVAL WEAPONS STATION CONCORD

ANALYSIS	ANALYTE	ORIGINAL RESULT (281RADSW104)	QUAL	UNIT	DUPLICATE RESULT (281RADSW105)	QUAL	UNIT	RPD
PEST	4,4'-DDT	0.027	J	UG/L	0.1	U	UG/L	115.0
PEST	ALDRIN	0.012	J	UG/L	0.05	U	UG/L	122.6
PEST	DIELDRIN	0.027	J	UG/L	0.1	U	UG/L	115.0
PEST	ENDRIN	0.028	J	UG/L	0.1	U	UG/L	112.5
PEST	GAMMA-BHC (LINDANE)	0.012	J	UG/L	0.05	U	UG/L	122.6
PEST	HEPTACHLOR	0.013	J	UG/L	0.05	U	UG/L	117.5
SOLIDS	TOTAL SUSPENDED SOLIDS	132		MG/L	96		MG/L	31.6
TMETAL	ALUMINUM	1350		UG/L	1430		UG/L	5.8
TMETAL	BARIUM	41.3		UG/L	41		UG/L	0.7
TMETAL	CALCIUM	47100		UG/L	43200		UG/L	8.6
TMETAL	CHROMIUM	4.2		UG/L	4.1		UG/L	2.4
TMETAL	COBALT	1.6		UG/L	1.3		UG/L	20.7
TMETAL	COPPER	8.2		UG/L	5.9		UG/L	32.6
TMETAL	IRON	1980		UG/L	2110		UG/L	6.4
TMETAL	MAGNESIUM	120000		UG/L	111000		UG/L	7.8
TMETAL	MANGANESE	90.6		UG/L	99.9		UG/L	9.8
TMETAL	MOLYBDENUM	1.9		UG/L	1.7		UG/L	11.1
TMETAL	NICKEL	7.9		UG/L	6.3		UG/L	22.5
TMETAL	POTASSIUM	32700		UG/L	34700		UG/L	5.9
TMETAL	SODIUM	926000		UG/L	867000		UG/L	6.6
TMETAL	VANADIUM	9.9		UG/L	9.2		UG/L	7.3
TOC	TOTAL ORGANIC CARBON	6.3		MG/L	8		MG/L	23.8

Notes: QUAL = Qualifier, U = Nondetected, J = Estimated, R = Rejected, RPD = Relative Percent Difference
MG/L = Milligrams per liter, UG/L = Micrograms per liter

Only analyses that were detected appear in the table.

TABLE K-11
FIELD DUPLICATE SUMMARY TABLE (CONTINUED)
NAVAL WEAPONS STATION CONCORD

ANALYSIS	ANALYTE	ORIGINAL RESULT (28IRADSW204)	QUAL	UNIT	DUPLICATE RESULT (28IRADSW205)	QUAL	UNIT	RPD
SOLIDS	TOTAL SUSPENDED SOLIDS	111		MG/L	275		MG/L	85.0
TMETAL	ALUMINUM	1250		UG/L	1320		UG/L	5.4
TMETAL	ARSENIC	1.8		UG/L	2.7		UG/L	40.0
TMETAL	BARIUM	27.9		UG/L	27.6		UG/L	1.1
TMETAL	CALCIUM	20000		UG/L	19900		UG/L	0.5
TMETAL	CHROMIUM	4.2		UG/L	4.2		UG/L	0.0
TMETAL	COPPER	8.3		UG/L	8		UG/L	3.7
TMETAL	IRON	1920		UG/L	1880		UG/L	2.1
TMETAL	MAGNESIUM	26900		UG/L	25200		UG/L	6.5
TMETAL	MANGANESE	74.3		UG/L	74.2		UG/L	0.1
TMETAL	NICKEL	6.7		UG/L	6.7		UG/L	0.0
TMETAL	POTASSIUM	7950		UG/L	6730		UG/L	16.6
TMETAL	SODIUM	178000		UG/L	151000		UG/L	16.4
TMETAL	VANADIUM	7.3		UG/L	7.1		UG/L	2.8
TOC	TOTAL ORGANIC CARBON	7.1		MG/L	6.6		MG/L	7.3

Notes: QUAL = Qualifier, U = Nondetected, J = Estimated, R = Rejected, RPD = Relative Percent Difference
MG/L = Milligrams per liter, UG/L = Micrograms per liter

Only analyses that were detected appear in the table.

TABLE K-11
FIELD DUPLICATE SUMMARY TABLE (CONTINUED)
NAVAL WEAPONS STATION CONCORD

ANALYSIS	ANALYTE	ORIGINAL RESULT (28TRADSW012)	QUAL	UNIT	DUPLICATE RESULT (28TRADSW013)	QUAL	UNIT	RPD
SOLIDS	TOTAL SUSPENDED SOLIDS	238		MG/L	332		MG/L	33.0
SVOA	FLUORANTHENE	10	U	UG/L	6	J	UG/L	50.0
TMETAL	ALUMINUM	678		UG/L	972		UG/L	35.6
TMETAL	ARSENIC	23.9		UG/L	33		UG/L	32.0
TMETAL	BARIUM	133		UG/L	151		UG/L	12.7
TMETAL	CALCIUM	123000		UG/L	122000		UG/L	0.8
TMETAL	COBALT	20.8		UG/L	26.7		UG/L	24.8
TMETAL	COPPER	10.6	J	UG/L	13.2		UG/L	21.8
TMETAL	IRON	53300		UG/L	70200		UG/L	27.4
TMETAL	LEAD	7.4	J	UG/L	10.9		UG/L	38.3
TMETAL	MAGNESIUM	290000		UG/L	292000		UG/L	0.7
TMETAL	MANGANESE	4540		UG/L	4650		UG/L	2.4
TMETAL	MOLYBDENUM	6.3	J	UG/L	5.6		UG/L	11.8
TMETAL	POTASSIUM	89100		UG/L	90000		UG/L	1.0
TMETAL	SODIUM	2280000		UG/L	2450000		UG/L	7.2
TMETAL	VANADIUM	18.5	J	UG/L	25.6		UG/L	32.2
TMETAL	ZINC	101	J	UG/L	135	J	UG/L	28.8
TOC	TOTAL ORGANIC CARBON	65.8		MG/L	63.7		MG/L	3.2

Notes: QUAL = Qualifier, U = Nondetected, J = Estimated, R = Rejected, RPD = Relative Percent Difference
MG/L = Milligrams per liter, UG/L = Micrograms per liter

Only analyses that were detected appear in the table.

TABLE K-11
FIELD DUPLICATE SUMMARY TABLE (CONTINUED)
NAVAL WEAPONS STATION CONCORD

ANALYSIS	ANALYTE	ORIGINAL RESULT (281RADSW213)	QUAL	UNIT	DUPLICATE RESULT (281RADSW214)	QUAL	UNIT	RPD
SOLIDS	TOTAL SUSPENDED SOLIDS	45		MG/L	30		MG/L	40.0
TMETAL	ALUMINUM	682		UG/L	310		UG/L	75.0
TMETAL	ARSENIC	2.7		UG/L	1.4	U	UG/L	63.4
TMETAL	BARIUM	43		UG/L	40.5		UG/L	6.0
TMETAL	CALCIUM	118000		UG/L	121000		UG/L	2.5
TMETAL	COBALT	17		UG/L	17		UG/L	0.0
TMETAL	COPPER	10.5		UG/L	9.6		UG/L	9.0
TMETAL	IRON	3760		UG/L	2210		UG/L	51.9
TMETAL	MAGNESIUM	145000		UG/L	150000		UG/L	3.4
TMETAL	MANGANESE	1820		UG/L	1870		UG/L	2.7
TMETAL	NICKEL	59.8		UG/L	60.6		UG/L	1.3
TMETAL	POTASSIUM	30600		UG/L	30500		UG/L	0.3
TMETAL	SELENIUM	2.3	U	UG/L	2.3		UG/L	0.0
TMETAL	SODIUM	807000		UG/L	824000		UG/L	2.1
TMETAL	ZINC	55.4		UG/L	63.6		UG/L	13.8
TOC	TOTAL ORGANIC CARBON	20.6		MG/L	22.2		MG/L	7.5

Notes: QUAL = Qualifier, U = Nondetected, J = Estimated, R = Rejected, RPD = Relative Percent Difference
MG/L = Milligrams per liter, UG/L = Micrograms per liter

Only analyses that were detected appear in the table.

TABLE K-11
FIELD DUPLICATE SUMMARY TABLE (CONTINUED)
NAVAL WEAPONS STATION CONCORD

ANALYSIS	ANALYTE	ORIGINAL RESULT (28TUMSS0003)	QUAL	UNIT	DUPLICATE RESULT (28TUMSSD004)	QUAL	UNIT	RPD
SOLIDS	TOTAL SUSPENDED SOLIDS	20		MG/L	10	U	MG/L	66.7
TMETAL	ALUMINUM	167		UG/L	146	U	UG/L	13.4
TMETAL	BARIUM	46.7		UG/L	48		UG/L	2.7
TMETAL	CALCIUM	40000		UG/L	40600		UG/L	1.5
TMETAL	COBALT	0.5	U	UG/L	0.73		UG/L	37.4
TMETAL	IRON	396		UG/L	410		UG/L	3.5
TMETAL	LEAD	1.5	U	UG/L	2		UG/L	28.6
TMETAL	MAGNESIUM	96500		UG/L	96100		UG/L	0.4
TMETAL	MANGANESE	44.6		UG/L	61.3		UG/L	31.5
TMETAL	POTASSIUM	30600		UG/L	30100		UG/L	1.6
TMETAL	SODIUM	807000		UG/L	791000		UG/L	2.0
TOC	TOTAL ORGANIC CARBON	6.7		MG/L	7.1		MG/L	5.8

Notes: QUAL = Qualifier, U = Nondetected, J = Estimated, R = Rejected, RPD = Relative Percent Difference
MG/L = Milligrams per liter, UG/L = Micrograms per liter

Only analyses that were detected appear in the table.

TABLE K-11
FIELD DUPLICATE SUMMARY TABLE (CONTINUED)
NAVAL WEAPONS STATION CONCORD

ANALYSIS	ANALYTE	ORIGINAL RESULT (281WSS4203)	QUAL	UNIT	DUPLICATE RESULT (281WSS4204)	QUAL	UNIT	RPD
SOLIDS	TOTAL SUSPENDED SOLIDS	19		MG/L	10	U	MG/L	62.1
TMETAL	ALUMINUM	818		UG/L	711		UG/L	14.0
TMETAL	ARSENIC	2.1		UG/L	2.2		UG/L	4.7
TMETAL	BARIUM	33.2		UG/L	27.8		UG/L	17.7
TMETAL	CALCIUM	30400		UG/L	25500		UG/L	17.5
TMETAL	COPPER	5.3		UG/L	5.3		UG/L	0.0
TMETAL	IRON	1470		UG/L	1260		UG/L	15.4
TMETAL	LEAD	1.4		UG/L	1.3		UG/L	7.4
TMETAL	MAGNESIUM	61600		UG/L	52100		UG/L	16.7
TMETAL	MANGANESE	82.3		UG/L	72.9		UG/L	12.1
TMETAL	NICKEL	4.7		UG/L	4		UG/L	16.1
TMETAL	POTASSIUM	20000		UG/L	17700		UG/L	12.2
TMETAL	SELENIUM	2.3	U	UG/L	3		UG/L	26.4
TMETAL	SODIUM	504000		UG/L	439000		UG/L	13.8
TMETAL	VANADIUM	5.1		UG/L	4.4		UG/L	14.7
TOC	TOTAL ORGANIC CARBON	9		MG/L	9.1		MG/L	1.1

Notes: QUAL = Qualifier, U = Nondetected, J = Estimated, R = Rejected, RPD = Relative Percent Difference
MG/L = Milligrams per liter, UG/L = Micrograms per liter

Only analyses that were detected appear in the table.

TABLE K-12

ANALYTICAL AND MATRIX PERFORMANCE REQUIREMENTS FOR ORGANIC ANALYSIS

NAVAL WEAPONS STATION CONCORD

Analysis	Performance Requirements	Detected Data Qualified as "J7" (Estimated)	Detected and Nondetected Data Qualified as "J7" (Estimated)	Detected Data Qualified as "J7" (Estimated) and Nondetected Data Qualified as "R7" (Rejected)
CLP volatiles, CLP semivolatiles, and low-level CLP semivolatiles	Sample IS: 50-150%	Sample IS: > 150%	Sample IS: < 50%	Sample IS: < 25%
	IPCS: meet all m/z criteria for volatiles[a] and for semivolatiles[b]	N/A	Criteria met for critical abundances, but not noncritical abundances[a,b]	Criteria not met for all critical abundances[a,b]
CLP pesticides/ polychlorinated biphenyls (PCBs) and low-level CLP pesticides/PCBs	RCM & PEM: meet all criteria[c]	N/A	PEM RPD: > ± 25%	RCM %res: < 60% PEM %res: < 100% PEM RT: > mRT ± 0.05 PEM %break: > 20% for each PEM %break: > 30% for both[d]
	Florisil %R: 80-120% & GPC %R: 80-110%[e]	Florisil %R: > 120% GPC %R: > 110%	Florisil or GPC %R: < 80%	Florisil or GPC %R: < 10%

TABLE K-12

ANALYTICAL AND MATRIX PERFORMANCE REQUIREMENTS FOR ORGANIC ANALYSIS

NAVAL WEAPONS STATION CONCORD (Continued)

Notes:

CLP: Contract Laboratory Program
IS: Internal standard
IPCS: Instrument performance check sample
N/A: Not applicable
RCM: Resolution check mixture
PEM: Performance evaluation mixture
RPD: Relative percent difference
%res: Percent resolution
RT: Retention time
mRT: Mean retention time
%break: Percent breakdown
%R: Percent recovery
GPC: Gel permeation cleanup
m/z: Mass ratio of the specific ion to the base peak

[a] Bromofluorobenzene (BFB)
m/z 50: 8.0-40.0% of m/z 95 *
m/z 75: 30.0-66.0% of m/z 95 *
m/z 95: Base peak, 100%
m/z 96: 5.0-9.0% of m/z 95
m/z 173: < 2.0% of m/z 174
m/z 174: 50.0-120.0% of m/z 95
m/z 175: 4.0-9.0% of m/z 174
m/z 176: 93.0-101.0% of m/z 174
m/z 177: 5.0-9.0% of m/z 176

[b] Decafluorotriphenylphosphine (DFTPP)
m/z 51: 30.0-80.0% of m/z 198 *
m/z 68: Less than 2.0% of m/z 69
m/z 69: Present
m/z 70: Less than 2.0% of m/z 69
m/z 127: 25.0-75.0% of m/z 198 *
m/z 197: Less than 1.0% of m/z 198
m/z 198: Base peak, 100% relative abundance
m/z 199: 5.0-9.0% of m/z 198
m/z 275: 10.0-30.0% of m/z 198 *
m/z 365: Greater than 0.75% of m/z 198
m/z 441: Present, but less than m/z 443
m/z 442: 40.0-110.0% of m/z 198
m/z 443: 15.0-24.0% of m/z 442

TABLE K-12

ANALYTICAL AND MATRIX PERFORMANCE REQUIREMENTS FOR ORGANIC ANALYSIS

NAVAL WEAPONS STATION CONCORD (Continued)

Notes (continued): * noncritical abundances

[c] RCM %res: > 60.0%
PEM %res: = 100%
PEM RT: = mRT ± 0.05 minutes
PEM %RPD: < 25%
PEM %break: < 20.0% (4,4'-DDT and endrin singly)
PEM %break: < 30.0% (4,4'-DDT and endrin together)

[d] Only affected nondetected data are qualified (e.g. unresolved or degraded compounds).
[e] Both apply to cleanup performance check samples.

Source: EPA 1990a; PRC 1992, 1994; and the specified analytical methods

TABLE K-13

ANALYTICAL AND MATRIX PERFORMANCE REQUIREMENTS FOR INORGANIC ANALYSIS

NAVAL WEAPONS STATION CONCORD

Analysis	Performance Requirements	Detected Data Estimated as Listed	Nondetected Data Estimated as Listed	Nondetected Data Rejected as Listed
CLP metals and modified WET CLP metals	ICPES serial dilution: %D ≤ 10%	%D > 10% (J7)	%D > 10% (J7)	N/A
	GFAA replicate analysis: RPD ≤ ± 20%	RPD > ± 20% (J5)	RPD > ± 20% (J5)	N/A
	GFAA analytical spike %R: 85-115%	%R > 115% (J4) %R < 85%[a] (J4)	%R < 85% (J4)	%R < 10% (R4)
	GFAA MSA: r ≥ 0.995	r < 0.995 (J7)	N/A	N/A

Notes:
CLP: Contract Laboratory Program
WET: Waste extraction test
ICPES: Inductively coupled plasma emission spectroscopy
%D: Percent difference
N/A: Not applicable
GFAA: Graphite furnace atomic absorption
RPD: Relative percent difference
%R: Percent recovery
MSA: Method of standard additions
r: Correlation coefficient
[a] If the %R is < 85% and the sample absorbance is > 50% of the analytical spike concentration, then the sample should have been run by MSA.

Source: EPA 1994; PRC 1992, 1994; and the specified analytical methods

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "J"
CLP Volatiles:					
1,1,1-TRICHLOROETHANE	SOIL	100	2	0	0
1,1,2,2-TETRACHLOROETHANE	SOIL	100	3	0	0
1,1,2-TRICHLOROETHANE	SOIL	100	2	0	0
1,1-DICHLOROETHANE	SOIL	100	2	0	0
1,1-DICHLOROETHENE	SOIL	100	2	0	0
1,2-DICHLOROETHANE	SOIL	100	2	0	0
1,2-DICHLOROETHENE (TOTAL)	SOIL	100	2	0	0
1,2-DICHLOROPROPANE	SOIL	100	2	0	0
2-BUTANONE	SOIL	100	2	0	0
2-HEXANONE	SOIL	100	2	0	0
4-METHYL-2-PENTANONE	SOIL	100	3	0	0
BENZENE	SOIL	100	2	0	0
BROMODICHLOROMETHANE	SOIL	100	2	0	0
BROMOFORM	SOIL	100	2	0	0
BROMOMETHANE	SOIL	100	2	0	0
CARBON DISULFIDE	SOIL	100	2	0	0
CARBON TETRACHLORIDE	SOIL	100	2	0	0
CHLOROBENZENE	SOIL	100	3	0	0
CHLOROETHANE	SOIL	100	2	0	0
CHLOROFORM	SOIL	100	2	0	0
CHLOROMETHANE	SOIL	100	2	0	0
CIS-1,3-DICHLOROPROPENE	SOIL	100	2	0	0
DIBROMOCHLOROMETHANE	SOIL	100	2	0	0
ETHYLBENZENE	SOIL	100	3	0	0
METHYLENE CHLORIDE	SOIL	100	2	0	0
STYRENE	SOIL	100	3	0	0
TETRACHLOROETHENE	SOIL	100	3	0	0
TOLUENE	SOIL	100	3	0	0

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "U"
TRANS-1,3-DICHLOROPROPENE	SOIL	100	2	0	0
TRICHLOROETHENE	SOIL	100	2	0	0
VINYL CHLORIDE	SOIL	100	2	0	0
XYLENE (TOTAL)	SOIL	100	3	0	0
Total	SOIL	3300	72 (2.18%)	0 (0.00%)	0 (0.00%)
CLP Semivolatiles:					
1,2,4-TRICHLOROBENZENE	SOIL	101	1	1	0
1,2-DICHLOROBENZENE	SOIL	101	1	1	0
1,3-DICHLOROBENZENE	SOIL	101	1	1	0
1,4-DICHLOROBENZENE	SOIL	101	1	1	0
2,2'-OXYBIS(1-CHLOROPROPANE)	SOIL	101	1	1	0
2,4,5-TRICHLOROPHENOL	SOIL	101	2	0	0
2,4,6-TRICHLOROPHENOL	SOIL	101	2	0	0
2,4-DICHLOROPHENOL	SOIL	101	2	0	0
2,4-DIMETHYLPHENOL	SOIL	101	2	0	0
2,4-DINITROPHENOL	SOIL	101	2	0	0
2,4-DINITROTOLUENE	SOIL	101	1	1	0
2,6-DINITROTOLUENE	SOIL	101	1	1	0
2-CHLORONAPHTHALENE	SOIL	101	1	1	0
2-CHLOROPHENOL	SOIL	101	2	0	0
2-METHYLNAPHTHALENE	SOIL	101	1	1	0
2-METHYLPHENOL	SOIL	101	2	0	0
2-NITROANILINE	SOIL	101	1	1	0
2-NITROPHENOL	SOIL	101	2	0	0
3,3'-DICHLOROBENZIDINE	SOIL	101	8	1	0
3-NITROANILINE	SOIL	101	1	1	0
4,6-DINITRO-2-METHYLPHENOL	SOIL	101	4	0	0
4-BROMOPHENYL-PHENYLETHER	SOIL	101	3	1	0
4-CHLORO-3-METHYLPHENOL	SOIL	101	2	0	0

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "UJ"
4-CHLOROANILINE	SOIL	101	1	1	0
4-CHLOROPHENYL-PHENYLETHER	SOIL	101	1	1	0
4-METHYLPHENOL	SOIL	101	2	0	0
4-NITROANILINE	SOIL	101	1	1	0
4-NITROPHENOL	SOIL	101	2	0	0
ACENAPHTHENE	SOIL	101	1	1	0
ACENAPHTHYLENE	SOIL	101	1	1	0
ANTHRACENE	SOIL	101	3	1	0
BENZO(A)ANTHRACENE	SOIL	101	8	1	0
BENZO(A)PYRENE	SOIL	101	9	1	0
BENZO(B)FLUORANTHENE	SOIL	101	9	1	0
BENZO(G,H,I)PERYLENE	SOIL	101	9	1	0
BENZO(K)FLUORANTHENE	SOIL	101	9	1	0
BIS(2-CHLOROETHOXY)METHANE	SOIL	101	1	1	0
BIS(2-CHLOROETHYL)ETHER	SOIL	101	1	1	0
BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	101	7	1	0
BUTYLBENZYLPHTHALATE	SOIL	101	8	1	0
CARBAZOLE	SOIL	101	3	1	0
CHRYSENE	SOIL	101	8	1	0
DI-N-BUTYLPHTHALATE	SOIL	101	3	1	0
DI-N-OCTYLPHTHALATE	SOIL	101	9	1	0
DIBENZ(A,H)ANTHRACENE	SOIL	101	8	1	0
DIBENZOFURAN	SOIL	101	1	1	0
DIETHYLPHTHALATE	SOIL	101	1	1	0
DIMETHYLPHTHALATE	SOIL	101	1	1	0
FLUORANTHENE	SOIL	101	3	1	0
FLUORENE	SOIL	101	1	1	0
HEXACHLOROBENZENE	SOIL	101	3	1	0
HEXACHLOROBUTADIENE	SOIL	101	1	1	0

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "U"
HEXACHLOROCYCLOPENTADIENE	SOIL	101	2	1	0
HEXACHLOROETHANE	SOIL	101	1	1	0
INDENO(1,2,3-CD)PYRENE	SOIL	101	9	1	0
ISOPHORONE	SOIL	101	1	1	0
N-NITROSO-DI-N-PROPYLAMINE	SOIL	101	1	1	0
N-NITROSODIPHENYLAMINE (1)	SOIL	101	3	1	0
NAPHTHALENE	SOIL	101	1	1	0
NITROBENZENE	SOIL	101	1	1	0
PENTACHLOROPHENOL	SOIL	101	4	0	0
PHENANTHRENE	SOIL	101	3	1	0
PHENOL	SOIL	101	1	0	0
PYRENE	SOIL	101	7	1	0
Total	SOIL	6464	193 (2.99%)	50 (0.77%)	0 (0.00%)
2,4,5-TRICHLOROPHENOL	SWATER	60	1	0	0
2,4,6-TRICHLOROPHENOL	SWATER	60	1	0	0
2,4-DINITROPHENOL	SWATER	60	1	0	0
2,4-DINITROTOLUENE	SWATER	60	1	0	0
2,6-DINITROTOLUENE	SWATER	60	1	0	0
2-CHLORONAPHTHALENE	SWATER	60	1	0	0
2-NITROANILINE	SWATER	60	1	0	0
3-NITROANILINE	SWATER	60	1	0	0
4-CHLOROPHENYL-PHENYLETHER	SWATER	60	1	0	0
4-NITROANILINE	SWATER	60	1	0	0
4-NITROPHENOL	SWATER	60	1	0	0
ACENAPHTHENE	SWATER	60	1	0	0
ACENAPHTHYLENE	SWATER	60	1	0	0
BENZO(A)PYRENE	SWATER	60	1	1	0
BENZO(B)FLUORANTHENE	SWATER	60	1	1	0
BENZO(G,H,I)PERYLENE	SWATER	60	1	1	0

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "U"
BENZO(K)FLUORANTHENE	SWATER	60	1	1	0
DI-N-OCTYLPHTHALATE	SWATER	60	1	1	0
DIBENZ(A,H)ANTHRACENE	SWATER	60	1	1	0
DIBENZOFURAN	SWATER	60	1	0	0
DIETHYLPHTHALATE	SWATER	60	1	0	0
DIMETHYLPHTHALATE	SWATER	60	1	0	0
FLUORENE	SWATER	60	1	0	0
HEXACHLOROCYCLOPENTADIENE	SWATER	60	1	0	0
INDENO(1,2,3-CD)PYRENE	SWATER	60	1	1	0
Total	SWATER	3840	25 (0.65%)	7 (0.18%)	0 (0.00%)
3,3'-DICHLOROBENZIDINE	WATER	2	1	0	0
BENZO(A)ANTHRACENE	WATER	2	1	0	0
BIS(2-ETHYLHEXYL)PHTHALATE	WATER	2	1	0	0
BUTYLBENZYLPHTHALATE	WATER	2	1	0	0
CHRYSENE	WATER	2	1	0	0
PYRENE	WATER	2	1	0	0
Total	WATER	128	6 (4.69%)	0 (0.00%)	0 (0.00%)
CLP Pesticides/PCBs					
4,4'-DDD	SOIL	100	1	0	0
4,4'-DDE	SOIL	100	1	0	0
4,4'-DDT	SOIL	100	2	0	0
AROCLOR-1260	SOIL	100	1	0	0
ENDOSULFAN II	SOIL	100	1	0	0
ENDOSULFAN SULFATE	SOIL	100	1	0	0
ENDRIN	SOIL	100	1	0	0
ENDRIN ALDEHYDE	SOIL	100	1	0	0
ENDRIN KETONE	SOIL	100	1	0	0
METHOXYCHLOR	SOIL	100	1	0	0
TOXAPHENE	SOIL	100	1	0	0
Total	SOIL	2800	12 (0.43%)	0 (0.00%)	0 (0.00%)

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "UJ"
ALDRIN	WATER	60	1	0	0
Total	WATER	1680	1 (0.06%)	0 (0.00%)	0 (0.00%)
4,4'-DDD	WATER	2	1	0	0
4,4'-DDE	WATER	2	1	0	0
4,4'-DDT	WATER	2	1	0	0
ALDRIN	WATER	2	1	0	0
ALPHA-BHC	WATER	2	1	0	0
ALPHA-CHLORDANE	WATER	2	1	0	0
AROCLOR-1016	WATER	2	1	0	0
AROCLOR-1232	WATER	2	1	0	0
AROCLOR-1242	WATER	2	1	0	0
AROCLOR-1260	WATER	2	1	0	0
BETA-BHC	WATER	2	1	0	0
DELTA-BHC	WATER	2	1	0	0
DIELDRIN	WATER	2	1	0	0
ENDOSULFAN I	WATER	2	1	0	0
ENDOSULFAN II	WATER	2	1	0	0
ENDOSULFAN SULFATE	WATER	2	1	0	0
ENDRIN	WATER	2	1	0	0
ENDRIN ALDEHYDE	WATER	2	1	0	0
ENDRIN KETONE	WATER	2	1	0	0
GAMMA-BHC (LINDANE)	WATER	2	1	0	0
GAMMA-CHLORDANE	WATER	2	1	0	0
HEPTACHLOR	WATER	2	1	0	0
HEPTACHLOR EPOXIDE	WATER	2	1	0	0
METHOXYCHLOR	WATER	2	1	0	0
TOXAPHENE	WATER	2	1	0	0
Total	WATER	56	25 (44.64%)	0 (0.00%)	0 (0.00%)

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "J"
Low Level CLP Pesticides/PCBs:					
4,4'-DDD	SEDIMENT	5	1	0	0
PCB-153 (2,2',4,4',5,5')	SEDIMENT	5	1	0	0
PCB-52 (2,2',5,5')	SEDIMENT	5	1	0	0
PCB-66 (2,3',4,4')	SEDIMENT	5	1	0	0
Total	SEDIMENT	175	4 (2.29%)	0 (0.00%)	0 (0.00%)
2,4'-DDD	SOIL	129	28	0	0
2,4'-DDE	SOIL	129	3	0	0
2,4'-DDT	SOIL	129	9	0	0
4,4'-DDD	SOIL	129	5	0	0
4,4'-DDE	SOIL	129	5	0	0
4,4'-DDT	SOIL	129	12	0	0
ALDRIN	SOIL	129	4	0	0
ALPHA-CHLORDANE	SOIL	129	14	0	0
GAMMA-BHC (LINDANE)	SOIL	129	2	0	0
HEPTACHLOR EPOXIDE	SOIL	129	1	0	0
HEXACHLOROBENZENE	SOIL	129	5	0	0
MIREX	SOIL	129	9	0	0
PCB-101 (2,2',3,5,5')	SOIL	129	27	0	0
PCB-105 (2,3,3',4,4')	SOIL	129	17	0	0
PCB-118 (2,3',4,4',5)	SOIL	129	15	0	0
PCB-126 (3,3',4,4',5)	SOIL	129	5	0	0
PCB-128 (2,2',3,3',4,4')	SOIL	129	6	0	0
PCB-138 (2,2',3,4,4',5')	SOIL	129	25	0	0
PCB-153 (2,2',4,4',5,5')	SOIL	129	10	0	0
PCB-170 (2,2',3,3',4,4',5)	SOIL	129	5	0	0
PCB-18 (2,2',5)	SOIL	129	8	0	0
PCB-180 (2,2',3,4,4',5,5')	SOIL	129	14	0	0
PCB-187 (2,2',3,4',5,5',6)	SOIL	129	13	0	0

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "UJ"
PCB-195 (2,2',3,3',4,4',5,6)	SOIL	129	4	0	1
PCB-206 (2,2,',3,3',4,4',5,5',	SOIL	129	15	0	0
PCB-28 (2,4,4')	SOIL	129	1	0	0
PCB-44 (2,2',3,5')	SOIL	129	8	0	0
PCB-52 (2,2',5,5')	SOIL	129	15	0	0
PCB-66 (2,3',4,4')	SOIL	129	8	0	1
PCB-77 (3,3',4,4')	SOIL	129	8	0	0
PCB-8 (2,4')	SOIL	129	3	0	0
TRANS-NONACHLOR	SOIL	129	16	0	0
Total	SOIL	4515	320 (7.09%)	0 (0.00%)	2 (0.04%)
Explosives					
TETRYL	WATER	2	1	0	0
Total	WATER	24	1 (4.17%)	0 (0.00%)	0 (0.00%)
CLP Metals					
CADMIUM	SEDIMENT	5	2	0	0
MOLYBDENUM	SEDIMENT	5	1	0	0
POTASSIUM	SEDIMENT	5	2	0	0
THALLIUM	SEDIMENT	5	1	0	0
Total	SEDIMENT	120	6 (5.00%)	0 (0.00%)	0 (0.00%)
ANTIMONY	SOIL	294	2	0	0
ARSENIC	SOIL	294	1	0	0
CADMIUM	SOIL	294	5	0	0
COPPER	SOIL	294	23	0	0
LEAD	SOIL	294	5	0	0
MOLYBDENUM	SOIL	294	2	0	0
POTASSIUM	SOIL	294	278	0	0
SELENIUM	SOIL	294	3	0	0
SODIUM	SOIL	294	121	0	0
THALLIUM	SOIL	294	4	0	0
ZINC	SOIL	294	18	0	0

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "U"
Total	SOIL	7056	462 (6.55%)	0 (0.00%)	0 (0.00%)
ARSENIC	SWATER	60	2	0	0
CADMIUM	SWATER	60	3	0	0
COBALT	SWATER	60	2	0	0
COPPER	SWATER	60	3	0	0
LEAD	SWATER	60	2	0	0
MOLYBDENUM	SWATER	60	3	0	0
NICKEL	SWATER	60	2	0	0
SELENIUM	SWATER	60	2	0	0
SILVER	SWATER	60	1	0	0
THALLIUM	SWATER	60	1	0	0
VANADIUM	SWATER	60	3	0	0
ZINC	SWATER	60	3	0	0
Total	SWATER	1440	27 (1.88%)	0 (0.00%)	0 (0.00%)
MOLYBDENUM	WATER	2	1	0	0
SODIUM	WATER	2	1	0	0
THALLIUM	WATER	2	1	0	0
Total	WATER	49	3 (6.12%)	0 (0.00%)	0 (0.00%)
WET Acid CLP Metals:					
ALUMINUM	SOIL	15	1	0	0
BERYLLIUM	SOIL	15	1	0	0
CADMIUM	SOIL	15	2	0	0
CALCIUM	SOIL	15	1	0	0
COBALT	SOIL	15	5	0	0
IRON	SOIL	15	4	0	0
LEAD	SOIL	15	10	0	0
MOLYBDENUM	SOIL	15	1	0	0
NICKEL	SOIL	15	10	0	0
POTASSIUM	SOIL	15	5	0	0
SELENIUM	SOIL	15	1	0	0

TABLE K-14

DATA QUALIFICATION: ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"	Number (Percent) of Analytes Rejected as "R"	Number (Percent) of Analytes Qualified as "J"
THALLIUM	SOIL	15	1	0	0
ZINC	SOIL	15	6	0	0
Total	SOIL	360	48 (13.33%)	0 (0.00%)	0 (0.00%)
WET CLP Metals:					
ALUMINUM	SEDIMENT	5	2	0	0
IRON	SEDIMENT	5	2	0	0
MANGANESE	SEDIMENT	5	2	0	0
MOLYBDENUM	SEDIMENT	5	1	0	0
POTASSIUM	SEDIMENT	5	2	0	0
SILVER	SEDIMENT	5	1	0	0
THALLIUM	SEDIMENT	5	1	0	0
VANADIUM	SEDIMENT	5	2	0	0
Total	SEDIMENT	120	13 (10.83%)	0 (0.00%)	0 (0.00%)
ALUMINUM	SOIL	47	16	0	0
BARIUM	SOIL	47	8	0	0
CALCIUM	SOIL	47	2	0	0
COPPER	SOIL	47	3	0	0
IRON	SOIL	47	17	0	0
MAGNESIUM	SOIL	47	11	0	0
MANGANESE	SOIL	47	14	0	0
POTASSIUM	SOIL	47	31	0	0
SODIUM	SOIL	47	4	0	0
VANADIUM	SOIL	47	4	0	0
ZINC	SOIL	47	26	0	0
Total	SOIL	1128	136 (12.06%)	0 (0.00%)	0 (0.00%)
Tidal Areas	All	49155	1354 (2.75%)	57 (0.12%)	2 (0.00%)

Note: This qualification applies to CLP volatiles, CLP semivolatiles, CLP pesticides/PCBs, CLP metals, WET CLP metals, low level CLP semivolatiles, and low level CLP pesticides/PCBs.

TABLE K-15

DATA QUALIFICATION: RESULTS REPORTED BELOW THE CRQL
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J"
CLP Volatiles			
2-BUTANONE	SOIL	100	1
CARBON DISULFIDE	SOIL	100	8
CHLOROMETHANE	SOIL	100	3
XYLENE (TOTAL)	SOIL	100	2
Total	SOIL	3300	14 (0.42%)
XYLENE (TOTAL)	SWATER	60	1
Total	SWATER	1980	1 (0.05%)
CLP Semivolatiles			
BENZO(A)ANTHRACENE	SOIL	101	1
BENZO(B)FLUORANTHENE	SOIL	101	2
CARBAZOLE	SOIL	101	1
CHRYSENE	SOIL	101	2
NAPHTHALENE	SOIL	101	1
PHENANTHRENE	SOIL	101	1
PHENOL	SOIL	101	12
Total	SOIL	6464	20 (0.31%)
Low Level CLP Semivolatiles			
2,6-DIMETHYLNAPHTHALENE	SEDIMENT	5	1
ANTHRACENE	SEDIMENT	5	1
BENZO(A)PYRENE	SEDIMENT	5	1
BENZO(E)PYRENE	SEDIMENT	5	1
FLUORANTHENE	SEDIMENT	5	1
INDENO(1,2,3-CD)PYRENE	SEDIMENT	5	1
PERYLENE	SEDIMENT	5	2
PHENANTHRENE	SEDIMENT	5	1
PYRENE	SEDIMENT	5	1
Total	SEDIMENT	370	10 (2.70%)
1,1'-BIPHENYL	SOIL	129	1
1-METHYLNAPHTHALENE	SOIL	129	2
1-METHYLPHENANTHRENE	SOIL	129	2

TABLE K-15

DATA QUALIFICATION: RESULTS REPORTED BELOW THE CRQL (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J2"
2,4-DIMETHYLPHENOL	SOIL	129	3
2,6-DIMETHYLNAPHTHALENE	SOIL	129	9
2-METHYLNAPHTHALENE	SOIL	129	3
4-METHYLPHENOL	SOIL	129	6
ACENAPHTHENE	SOIL	129	6
ACENAPHTHYLENE	SOIL	129	1
ANTHRACENE	SOIL	129	12
BENZO(A)ANTHRACENE	SOIL	129	26
BENZO(A)PYRENE	SOIL	129	27
BENZO(B)FLUORANTHENE	SOIL	129	26
BENZO(E)PYRENE	SOIL	129	31
BENZO(G,H,I)PERYLENE	SOIL	129	21
BENZO(K)FLUORANTHENE	SOIL	129	25
BENZOIC ACID	SOIL	129	29
BUTYLBENZYLPHTHALATE	SOIL	129	2
CARBAZOLE	SOIL	129	13
CHRYSENE	SOIL	129	31
DIBENZ(A,H)ANTHRACENE	SOIL	129	8
DIBENZOFURAN	SOIL	129	3
DIBENZOTHIOPHENE	SOIL	129	4
FLUORANTHENE	SOIL	129	43
FLUORENE	SOIL	129	5
INDENO(1,2,3-CD)PYRENE	SOIL	129	18
ISOPHORONE	SOIL	129	1
NAPHTHALENE	SOIL	129	5
PENTACHLOROPHENOL	SOIL	129	3
PERYLENE	SOIL	129	10
PHENANTHRENE	SOIL	129	29
PYRENE	SOIL	129	40

TABLE K-15

DATA QUALIFICATION: RESULTS REPORTED BELOW THE CRQL (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J2"
Total	SOIL	9546	445 (4.66%)
CLP Pesticides/PCBs:			
4,4'-DDD	SOIL	100	3
4,4'-DDE	SOIL	100	2
4,4'-DDT	SOIL	100	3
ALPHA-CHLORDANE	SOIL	100	2
ENDRIN KETONE	SOIL	100	1
GAMMA-CHLORDANE	SOIL	100	1
Total	SOIL	2800	12 (0.43%)
4,4'-DDT	SWATER	60	1
ALDRIN	SWATER	60	1
DIELDRIN	SWATER	60	1
ENDRIN	SWATER	60	1
GAMMA-BHC (LINDANE)	SWATER	60	1
HEPTACHLOR	SWATER	60	1
Total	SWATER	1680	6 (0.36%)
Low Level CLP Pesticides/PCBs:			
PCB-101 (2,2',3,5,5')	SEDIMENT	5	1
PCB-153 (2,2',4,4',5,5')	SEDIMENT	5	1
Total	SEDIMENT	175	2 (1.14%)
2,4'-DDD	SOIL	129	2
2,4'-DDE	SOIL	129	1
MIREX	SOIL	129	8
PCB-101 (2,2',3,5,5')	SOIL	129	12
PCB-105 (2,3,3',4,4')	SOIL	129	2
PCB-118 (2,3',4,4',5)	SOIL	129	6
PCB-126 (3,3',4,4',5)	SOIL	129	4
PCB-128 (2,2',3,3',4,4')	SOIL	129	1
PCB-138 (2,2',3,4,4',5')	SOIL	129	4
PCB-153 (2,2',4,4',5,5')	SOIL	129	8
PCB-170 (2,2',3,3',4,4',5)	SOIL	129	1

TABLE K-15

DATA QUALIFICATION: RESULTS REPORTED BELOW THE CRQL (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated as "J2"
PCB-18 (2,2',5)	SOIL	129	10
PCB-180 (2,2',3,4,4',5,5')	SOIL	129	4
PCB-187 (2,2',3,4',5,5',6)	SOIL	129	13
PCB-206 (2,2,',3,3',4,4',5,5',	SOIL	129	9
PCB-209 (2,2',3,3',4,4',5,5',6	SOIL	129	1
PCB-44 (2,2',3,5')	SOIL	129	1
PCB-52 (2,2',5,5')	SOIL	129	10
PCB-66 (2,3',4,4')	SOIL	129	1
PCB-77 (3,3',4,4')	SOIL	129	3
Total	SOIL	4515	101 (2.24%)
TPH-Extractables:			
MOTOR OIL	SOIL	25	1
Total	SOIL	50	1 (2.00%)
DIESEL	SWATER	5	1
Total	SWATER	10	1 (10.00%)
TPH-Purgeables:			
GASOLINE	SOIL	7	1
Total	SOIL	7	1 (14.29%)
Dioxins:			
1,2,3,4,6,7,8-HPCDF	SOIL	2	1
HPCDFS (TOTAL)	SOIL	2	1
OCDD	SOIL	2	1
Total	SOIL	50	3 (6.00%)
Solids:			
TOTAL SUSPENDED SOLIDS	SWATER	60	2
Total	SWATER	60	2 (3.33%)
Tidal Areas	All	49155	619 (1.26%)

Note: This qualification applies only to CLP volatiles, CLP semivolatiles, CLP pesticides/PCBs, PCBs, TPH-extractables, TPH-purgeables, aromatic volatiles, low level CLP semivolatiles, low level CLP pesticides/PCBs, explosives, dioxins, and total suspended solids. Aromatic volatiles and explosives did not have any qualifications.

TABLE K-16

DATA EVALUATION: REPORTING LIMITS
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
Aromatic Volatiles:							
BENZENE	SOIL	1	56	56	56	5	UG/KG
ETHYLBENZENE	SOIL	1	56	56	56	5	UG/KG
TOLUENE	SOIL	1	56	56	56	5	UG/KG
XYLENE (TOTAL)	SOIL	1	56	56	56	15	UG/KG
CLP Volatiles:							
1,1,1-TRICHLOROETHANE	SOIL	100	11	140	25	10	UG/KG
1,1,2,2-TETRACHLOROETHANE	SOIL	100	11	140	25	10	UG/KG
1,1,2-TRICHLOROETHANE	SOIL	100	11	140	25	10	UG/KG
1,1-DICHLOROETHANE	SOIL	100	11	140	25	10	UG/KG
1,1-DICHLOROETHENE	SOIL	100	11	140	25	10	UG/KG
1,2-DICHLOROETHANE	SOIL	100	11	140	25	10	UG/KG
1,2-DICHLOROETHENE (TOTAL)	SOIL	100	11	140	25	10	UG/KG
1,2-DICHLOROPROPANE	SOIL	100	11	140	25	10	UG/KG
2-BUTANONE	SOIL	100	11	140	25	10	UG/KG
2-HEXANONE	SOIL	100	11	140	25	10	UG/KG
4-METHYL-2-PENTANONE	SOIL	100	11	140	25	10	UG/KG
ACETONE	SOIL	100	11	140	25	10	UG/KG
BENZENE	SOIL	100	11	140	25	10	UG/KG
BROMODICHLOROMETHANE	SOIL	100	11	140	25	10	UG/KG
BROMOFORM	SOIL	100	11	140	25	10	UG/KG
BROMOMETHANE	SOIL	100	11	140	25	10	UG/KG
CARBON DISULFIDE	SOIL	100	11	140	25	10	UG/KG
CARBON TETRACHLORIDE	SOIL	100	11	140	25	10	UG/KG
CHLOROBENZENE	SOIL	100	11	140	25	10	UG/KG
CHLOROETHANE	SOIL	100	11	140	25	10	UG/KG
CHLOROFORM	SOIL	100	11	140	25	10	UG/KG
CHLOROMETHANE	SOIL	100	11	140	25	10	UG/KG
CIS-1,3-DICHLOROPROPENE	SOIL	100	11	140	25	10	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
DIBROMOCHLOROMETHANE	SOIL	100	11	140	25	10	UG/KG
ETHYLBENZENE	SOIL	100	11	140	25	10	UG/KG
METHYLENE CHLORIDE	SOIL	100	11	140	25	10	UG/KG
STYRENE	SOIL	100	11	140	25	10	UG/KG
TETRACHLOROETHENE	SOIL	100	11	140	25	10	UG/KG
TOLUENE	SOIL	100	11	140	25	10	UG/KG
TRANS-1,3-DICHLOROPROPENE	SOIL	100	11	140	25	10	UG/KG
TRICHLOROETHENE	SOIL	100	11	140	25	10	UG/KG
VINYL CHLORIDE	SOIL	100	11	140	25	10	UG/KG
XYLENE (TOTAL)	SOIL	100	11	140	25	10	UG/KG
1,1,1-TRICHLOROETHANE	SWATER	60	10	10	10	2	UG/L
1,1,2,2-TETRACHLOROETHANE	SWATER	60	10	10	10	2	UG/L
1,1,2-TRICHLOROETHANE	SWATER	60	10	10	10	2	UG/L
1,1-DICHLOROETHANE	SWATER	60	10	10	10	2	UG/L
1,1-DICHLOROETHENE	SWATER	60	10	10	10	2	UG/L
1,2-DICHLOROETHANE	SWATER	60	10	10	10	0.5	UG/L
1,2-DICHLOROETHENE (TOTAL)	SWATER	60	10	10	10	2	UG/L
1,2-DICHLOROPROPANE	SWATER	60	10	10	10	2	UG/L
2-BUTANONE	SWATER	60	10	10	10	2	UG/L
2-HEXANONE	SWATER	60	10	10	10	2	UG/L
4-METHYL-2-PENTANONE	SWATER	60	10	10	10	2	UG/L
ACETONE	SWATER	60	10	10	10	2	UG/L
BENZENE	SWATER	60	10	10	10	0.5	UG/L
BROMODICHLOROMETHANE	SWATER	60	10	10	10	2	UG/L
BROMOFORM	SWATER	60	10	10	10	2	UG/L
BROMOMETHANE	SWATER	60	10	10	10	1	UG/L
CARBON DISULFIDE	SWATER	60	10	10	10	2	UG/L
CARBON TETRACHLORIDE	SWATER	60	10	10	10	0.5	UG/L
CHLOROBENZENE	SWATER	60	10	10	10	2	UG/L

TABLE K-16

DATA EVALUATION: REPORTING-LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	CAPP Reporting Limits Goals *	Units
CHLOROETHANE	SWATER	60	10	10	10	2	UG/L
CHLOROFORM	SWATER	60	10	10	10	2	UG/L
CHLOROMETHANE	SWATER	60	10	10	10	2	UG/L
CIS-1,3-DICHLOROPROPENE	SWATER	60	10	10	10	0.5	UG/L
DIBROMOCHLOROMETHANE	SWATER	60	10	10	10	2	UG/L
ETHYLBENZENE	SWATER	60	10	10	10	2	UG/L
METHYLENE CHLORIDE	SWATER	60	10	10	10	2	UG/L
STYRENE	SWATER	60	10	10	10	2	UG/L
TETRACHLOROETHENE	SWATER	60	10	10	10	2	UG/L
TOLUENE	SWATER	60	10	10	10	2	UG/L
TRANS-1,3-DICHLOROPROPENE	SWATER	60	10	10	10	0.5	UG/L
TRICHLOROETHENE	SWATER	60	10	10	10	2	UG/L
VINYL CHLORIDE	SWATER	60	10	10	10	0.5	UG/L
XYLENE (TOTAL)	SWATER	60	10	10	10	2	UG/L
1,1,1-TRICHLOROETHANE	WATER	2	10	10	10	2	UG/L
1,1,2,2-TETRACHLOROETHANE	WATER	2	10	10	10	2	UG/L
1,1,2-TRICHLOROETHANE	WATER	2	10	10	10	2	UG/L
1,1-DICHLOROETHANE	WATER	2	10	10	10	2	UG/L
1,1-DICHLOROETHENE	WATER	2	10	10	10	2	UG/L
1,2-DICHLOROETHANE	WATER	2	10	10	10	0.5	UG/L
1,2-DICHLOROETHENE (TOTAL)	WATER	2	10	10	10	2	UG/L
1,2-DICHLOROPROPANE	WATER	2	10	10	10	2	UG/L
2-BUTANONE	WATER	2	10	10	10	2	UG/L
2-HEXANONE	WATER	2	10	10	10	2	UG/L
4-METHYL-2-PENTANONE	WATER	2	10	10	10	2	UG/L
ACETONE	WATER	2	10	10	10	2	UG/L
BENZENE	WATER	2	10	10	10	0.5	UG/L
BROMODICHLOROMETHANE	WATER	2	10	10	10	2	UG/L
BROMOFORM	WATER	2	10	10	10	2	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
BROMOMETHANE	WATER	2	10	10	10	1	UG/L
CARBON DISULFIDE	WATER	2	10	10	10	2	UG/L
CARBON TETRACHLORIDE	WATER	2	10	10	10	0.5	UG/L
CHLOROBENZENE	WATER	2	10	10	10	2	UG/L
CHLOROETHANE	WATER	2	10	10	10	2	UG/L
CHLOROFORM	WATER	2	10	10	10	2	UG/L
CHLOROMETHANE	WATER	2	10	10	10	2	UG/L
CIS-1,3-DICHLOROPROPENE	WATER	2	10	10	10	0.5	UG/L
DIBROMOCHLOROMETHANE	WATER	2	10	10	10	2	UG/L
ETHYLBENZENE	WATER	2	10	10	10	2	UG/L
METHYLENE CHLORIDE	WATER	2	10	10	10	2	UG/L
STYRENE	WATER	2	10	10	10	2	UG/L
TETRACHLOROETHENE	WATER	2	10	10	10	2	UG/L
TOLUENE	WATER	2	10	10	10	2	UG/L
TRANS-1,3-DICHLOROPROPENE	WATER	2	10	10	10	0.5	UG/L
TRICHLOROETHENE	WATER	2	10	10	10	2	UG/L
VINYL CHLORIDE	WATER	2	10	10	10	0.5	UG/L
XYLENE (TOTAL)	WATER	2	10	10	10	2	UG/L
CLP Semivolatiles:							
1,2,4-TRICHLOROBENZENE	SOIL	101	330	20000	990	330	UG/KG
1,2-DICHLOROBENZENE	SOIL	101	330	20000	990	330	UG/KG
1,3-DICHLOROBENZENE	SOIL	101	330	20000	990	330	UG/KG
1,4-DICHLOROBENZENE	SOIL	101	330	20000	990	330	UG/KG
2,2'-OXYBIS(1-CHLOROPROPANE)	SOIL	101	330	20000	990	330	UG/KG
2,4,5-TRICHLOROPHENOL	SOIL	101	800	50000	2500	800	UG/KG
2,4,6-TRICHLOROPHENOL	SOIL	101	330	20000	990	330	UG/KG
2,4-DICHLOROPHENOL	SOIL	101	330	20000	990	330	UG/KG
2,4-DIMETHYLPHENOL	SOIL	101	330	20000	990	330	UG/KG
2,4-DINITROPHENOL	SOIL	101	800	50000	2500	800	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
2,4-DINITROTOLUENE	SOIL	101	330	20000	990	330	UG/KG
2,6-DINITROTOLUENE	SOIL	101	330	20000	990	330	UG/KG
2-CHLORONAPHTHALENE	SOIL	101	330	20000	990	330	UG/KG
2-CHLOROPHENOL	SOIL	101	330	20000	990	330	UG/KG
2-METHYLNAPHTHALENE	SOIL	101	330	20000	990	330	UG/KG
2-METHYLPHENOL	SOIL	101	330	20000	990	330	UG/KG
2-NITROANILINE	SOIL	101	800	50000	2500	800	UG/KG
2-NITROPHENOL	SOIL	101	330	20000	990	330	UG/KG
3,3'-DICHLOROBENZIDINE	SOIL	101	330	20000	990	330	UG/KG
3-NITROANILINE	SOIL	101	800	50000	2500	800	UG/KG
4,6-DINITRO-2-METHYLPHENOL	SOIL	101	800	50000	2500	800	UG/KG
4-BROMOPHENYL-PHENYLETHER	SOIL	101	330	20000	990	330	UG/KG
4-CHLORO-3-METHYLPHENOL	SOIL	101	330	20000	990	330	UG/KG
4-CHLOROANILINE	SOIL	101	330	20000	990	330	UG/KG
4-CHLOROPHENYL-PHENYLETHER	SOIL	101	330	20000	990	330	UG/KG
4-METHYLPHENOL	SOIL	101	330	20000	990	330	UG/KG
4-NITROANILINE	SOIL	101	800	50000	2500	800	UG/KG
4-NITROPHENOL	SOIL	101	800	50000	2500	800	UG/KG
ACENAPHTHENE	SOIL	101	330	20000	990	330	UG/KG
ACENAPHTHYLENE	SOIL	101	330	20000	990	330	UG/KG
ANTHRACENE	SOIL	101	330	20000	990	330	UG/KG
BENZO(A)ANTHRACENE	SOIL	101	330	20000	990	330	UG/KG
BENZO(A)PYRENE	SOIL	101	330	20000	990	330	UG/KG
BENZO(B)FLUORANTHENE	SOIL	101	330	20000	990	330	UG/KG
BENZO(G,H,I)PERYLENE	SOIL	101	330	20000	990	330	UG/KG
BENZO(K)FLUORANTHENE	SOIL	101	330	20000	990	330	UG/KG
BIS(2-CHLOROETHOXY)METHANE	SOIL	101	330	20000	990	330	UG/KG
BIS(2-CHLOROETHYL)ETHER	SOIL	101	330	20000	990	330	UG/KG
BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	101	330	20000	990	330	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
BUTYLBENZYLPHTHALATE	SOIL	101	330	20000	990	330	UG/KG
CARBAZOLE	SOIL	101	330	20000	990	330	UG/KG
CHRYSENE	SOIL	101	330	20000	990	330	UG/KG
DI-N-BUTYLPHTHALATE	SOIL	101	330	20000	990	330	UG/KG
DI-N-OCTYLPHTHALATE	SOIL	101	330	20000	990	330	UG/KG
DIBENZ(A,H)ANTHRACENE	SOIL	101	330	20000	990	330	UG/KG
DIBENZOFURAN	SOIL	101	330	20000	990	330	UG/KG
DIETHYLPHTHALATE	SOIL	101	330	20000	990	330	UG/KG
DIMETHYLPHTHALATE	SOIL	101	330	20000	990	330	UG/KG
FLUORANTHENE	SOIL	101	330	20000	990	330	UG/KG
FLUORENE	SOIL	101	330	20000	990	330	UG/KG
HEXACHLOROBENZENE	SOIL	101	330	20000	990	330	UG/KG
HEXACHLOROBUTADIENE	SOIL	101	330	20000	990	330	UG/KG
HEXACHLOROCYCLOPENTADIENE	SOIL	101	330	20000	990	330	UG/KG
HEXACHLOROETHANE	SOIL	101	330	20000	990	330	UG/KG
INDENO(1,2,3-CD)PYRENE	SOIL	101	330	20000	990	330	UG/KG
ISOPHORONE	SOIL	101	330	20000	990	330	UG/KG
N-NITROSO-DI-N-PROPYLAMINE	SOIL	101	330	20000	990	330	UG/KG
N-NITROSODIPHENYLAMINE (1)	SOIL	101	330	20000	990	330	UG/KG
NAPHTHALENE	SOIL	101	330	20000	990	330	UG/KG
NITROBENZENE	SOIL	101	330	20000	990	330	UG/KG
PENTACHLOROPHENOL	SOIL	101	800	50000	2500	800	UG/KG
PHENANTHRENE	SOIL	101	330	20000	990	330	UG/KG
PHENOL	SOIL	101	330	20000	980	330	UG/KG
PYRENE	SOIL	101	330	20000	990	330	UG/KG
1,2,4-TRICHLOROBENZENE	SWATER	60	10	100	13	10	UG/L
1,2-DICHLOROBENZENE	SWATER	60	5	50	6	5	UG/L
1,3-DICHLOROBENZENE	SWATER	60	5	50	6	5	UG/L
1,4-DICHLOROBENZENE	SWATER	60	5	50	6	5	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
2,2'-OXYBIS(1-CHLOROPROPANE)	SWATER	60	10	100	13	10	UG/L
2,4,5-TRICHLOROPHENOL	SWATER	60	25	250	32	25	UG/L
2,4,6-TRICHLOROPHENOL	SWATER	60	10	100	13	10	UG/L
2,4-DICHLOROPHENOL	SWATER	60	10	100	13	10	UG/L
2,4-DIMETHYLPHENOL	SWATER	60	10	100	13	10	UG/L
2,4-DINITROPHENOL	SWATER	60	25	250	32	25	UG/L
2,4-DINITROTOLUENE	SWATER	60	10	100	13	10	UG/L
2,6-DINITROTOLUENE	SWATER	60	10	100	13	10	UG/L
2-CHLORONAPHTHALENE	SWATER	60	10	100	13	10	UG/L
2-CHLOROPHENOL	SWATER	60	10	100	13	10	UG/L
2-METHYLNAPHTHALENE	SWATER	60	10	100	13	10	UG/L
2-METHYLPHENOL	SWATER	60	10	100	13	10	UG/L
2-NITROANILINE	SWATER	60	25	250	32	25	UG/L
2-NITROPHENOL	SWATER	60	10	100	13	10	UG/L
3,3'-DICHLOROBENZIDINE	SWATER	60	10	100	13	10	UG/L
3-NITROANILINE	SWATER	60	25	250	32	25	UG/L
4,6-DINITRO-2-METHYLPHENOL	SWATER	60	25	250	32	25	UG/L
4-BROMOPHENYL-PHENYLETHER	SWATER	60	10	100	13	10	UG/L
4-CHLORO-3-METHYLPHENOL	SWATER	60	10	100	13	10	UG/L
4-CHLOROANILINE	SWATER	60	10	100	13	10	UG/L
4-CHLOROPHENYL-PHENYLETHER	SWATER	60	10	100	13	10	UG/L
4-METHYLPHENOL	SWATER	60	10	100	13	10	UG/L
4-NITROANILINE	SWATER	60	25	250	32	25	UG/L
4-NITROPHENOL	SWATER	60	25	250	32	25	UG/L
ACENAPHTHENE	SWATER	60	10	100	13	10	UG/L
ACENAPHTHYLENE	SWATER	60	10	100	13	10	UG/L
ANTHRACENE	SWATER	60	10	100	13	10	UG/L
BENZO(A)ANTHRACENE	SWATER	60	10	100	13	10	UG/L
BENZO(A)PYRENE	SWATER	60	10	100	13	10	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
BENZO(B)FLUORANTHENE	SWATER	60	10	100	13	10	UG/L
BENZO(G,H,I)PERYLENE	SWATER	60	10	100	13	10	UG/L
BENZO(K)FLUORANTHENE	SWATER	60	10	100	13	10	UG/L
BIS(2-CHLOROETHOXY)METHANE	SWATER	60	10	100	13	10	UG/L
BIS(2-CHLOROETHYL)ETHER	SWATER	60	10	100	13	10	UG/L
BIS(2-ETHYLHEXYL)PHTHALATE	SWATER	60	4	50	6	4	UG/L
BUTYLBENZYLPHTHALATE	SWATER	60	10	100	13	10	UG/L
CARBAZOLE	SWATER	60	10	100	13	10	UG/L
CHRYSENE	SWATER	60	10	100	13	10	UG/L
DI-N-BUTYLPHTHALATE	SWATER	60	10	100	13	10	UG/L
DI-N-OCTYLPHTHALATE	SWATER	60	10	100	13	10	UG/L
DIBENZ(A,H)ANTHRACENE	SWATER	60	10	100	13	10	UG/L
DIBENZOFURAN	SWATER	60	10	100	13	10	UG/L
DIETHYLPHTHALATE	SWATER	60	10	100	13	10	UG/L
DIMETHYLPHTHALATE	SWATER	60	10	100	13	10	UG/L
FLUORANTHENE	SWATER	60	10	100	13	10	UG/L
FLUORENE	SWATER	60	10	100	13	10	UG/L
HEXACHLOROBENZENE	SWATER	60	10	100	13	10	UG/L
HEXACHLOROBUTADIENE	SWATER	60	10	100	13	10	UG/L
HEXACHLOROCYCLOPENTADIENE	SWATER	60	10	100	13	10	UG/L
HEXACHLOROETHANE	SWATER	60	10	100	13	10	UG/L
INDENO(1,2,3-CD)PYRENE	SWATER	60	10	100	13	10	UG/L
ISOPHORONE	SWATER	60	10	100	13	10	UG/L
N-NITROSO-DI-N-PROPYLAMINE	SWATER	60	10	100	13	10	UG/L
N-NITROSODIPHENYLAMINE (1)	SWATER	60	10	100	13	10	UG/L
NAPHTHALENE	SWATER	60	10	100	13	10	UG/L
NITROBENZENE	SWATER	60	10	100	13	10	UG/L
PENTACHLOROPHENOL	SWATER	60	25	250	32	25	UG/L
PHENANTHRENE	SWATER	60	10	100	13	10	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
PHENOL	SWATER	60	10	100	13	10	UG/L
PYRENE	SWATER	60	10	100	13	10	UG/L
1,2,4-TRICHLOROBENZENE	WATER	2	10	10	10	10	UG/L
1,2-DICHLOROBENZENE	WATER	2	5	5	5	5	UG/L
1,3-DICHLOROBENZENE	WATER	2	5	5	5	5	UG/L
1,4-DICHLOROBENZENE	WATER	2	5	5	5	5	UG/L
2,2'-OXYBIS(1-CHLOROPROPANE)	WATER	2	10	10	10	10	UG/L
2,4,5-TRICHLOROPHENOL	WATER	2	25	25	25	25	UG/L
2,4,6-TRICHLOROPHENOL	WATER	2	10	10	10	10	UG/L
2,4-DICHLOROPHENOL	WATER	2	10	10	10	10	UG/L
2,4-DIMETHYLPHENOL	WATER	2	10	10	10	10	UG/L
2,4-DINITROPHENOL	WATER	2	25	25	25	25	UG/L
2,4-DINITROTOLUENE	WATER	2	10	10	10	10	UG/L
2,6-DINITROTOLUENE	WATER	2	10	10	10	10	UG/L
2-CHLORONAPHTHALENE	WATER	2	10	10	10	10	UG/L
2-CHLOROPHENOL	WATER	2	10	10	10	10	UG/L
2-METHYLNAPHTHALENE	WATER	2	10	10	10	10	UG/L
2-METHYLPHENOL	WATER	2	10	10	10	10	UG/L
2-NITROANILINE	WATER	2	25	25	25	25	UG/L
2-NITROPHENOL	WATER	2	10	10	10	10	UG/L
3,3'-DICHLOROBENZIDINE	WATER	2	10	10	10	10	UG/L
3-NITROANILINE	WATER	2	25	25	25	25	UG/L
4,6-DINITRO-2-METHYLPHENOL	WATER	2	25	25	25	25	UG/L
4-BROMOPHENYL-PHENYLETHER	WATER	2	10	10	10	10	UG/L
4-CHLORO-3-METHYLPHENOL	WATER	2	10	10	10	10	UG/L
4-CHLOROANILINE	WATER	2	10	10	10	10	UG/L
4-CHLOROPHENYL-PHENYLETHER	WATER	2	10	10	10	10	UG/L
4-METHYLPHENOL	WATER	2	10	10	10	10	UG/L
4-NITROANILINE	WATER	2	25	25	25	25	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
4-NITROPHENOL	WATER	2	25	25	25	25	UG/L
ACENAPHTHENE	WATER	2	10	10	10	10	UG/L
ACENAPHTHYLENE	WATER	2	10	10	10	10	UG/L
ANTHRACENE	WATER	2	10	10	10	10	UG/L
BENZO(A)ANTHRACENE	WATER	2	10	10	10	10	UG/L
BENZO(A)PYRENE	WATER	2	10	10	10	10	UG/L
BENZO(B)FLUORANTHENE	WATER	2	10	10	10	10	UG/L
BENZO(G,H,I)PERYLENE	WATER	2	10	10	10	10	UG/L
BENZO(K)FLUORANTHENE	WATER	2	10	10	10	10	UG/L
BIS(2-CHLOROETHOXY)METHANE	WATER	2	10	10	10	10	UG/L
BIS(2-CHLOROETHYL)ETHER	WATER	2	10	10	10	10	UG/L
BIS(2-ETHYLHEXYL)PHTHALATE	WATER	2	4	4	4	4	UG/L
BUTYLBENZYLPHTHALATE	WATER	2	10	10	10	10	UG/L
CARBAZOLE	WATER	2	10	10	10	10	UG/L
CHRYSENE	WATER	2	10	10	10	10	UG/L
DI-N-BUTYLPHTHALATE	WATER	2	10	10	10	10	UG/L
DI-N-OCTYLPHTHALATE	WATER	2	10	10	10	10	UG/L
DIBENZ(A,H)ANTHRACENE	WATER	2	10	10	10	10	UG/L
DIBENZOFURAN	WATER	2	10	10	10	10	UG/L
DIETHYLPHTHALATE	WATER	2	10	10	10	10	UG/L
DIMETHYLPHTHALATE	WATER	2	10	10	10	10	UG/L
FLUORANTHENE	WATER	2	10	10	10	10	UG/L
FLUORENE	WATER	2	10	10	10	10	UG/L
HEXACHLOROBENZENE	WATER	2	10	10	10	10	UG/L
HEXACHLOROBUTADIENE	WATER	2	10	10	10	10	UG/L
HEXACHLOROCYCLOPENTADIENE	WATER	2	10	10	10	10	UG/L
HEXACHLOROETHANE	WATER	2	10	10	10	10	UG/L
INDENO(1,2,3-CD)PYRENE	WATER	2	10	10	10	10	UG/L
ISOPHORONE	WATER	2	10	10	10	10	UG/L

TABLE K-16

DATA EVALUATION: REPORTING-LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
N-NITROSO-DI-N-PROPYLAMINE	WATER	2	10	10	10	10	UG/L
N-NITROSODIPHENYLAMINE (1)	WATER	2	10	10	10	10	UG/L
NAPHTHALENE	WATER	2	10	10	10	10	UG/L
NITROBENZENE	WATER	2	10	10	10	10	UG/L
PENTACHLOROPHENOL	WATER	2	25	25	25	25	UG/L
PHENANTHRENE	WATER	2	10	10	10	10	UG/L
PHENOL	WATER	2	10	10	10	10	UG/L
PYRENE	WATER	2	10	10	10	10	UG/L
Low Level CLP Semivolatiles:							
1,1'-BIPHENYL	SEDIMENT	5	110	460	340	3	UG/KG
1,2,4-TRICHLOROBENZENE	SEDIMENT	5	110	460	340	11	UG/KG
1,2-DICHLOROBENZENE	SEDIMENT	5	110	460	340	11	UG/KG
1,3-DICHLOROBENZENE	SEDIMENT	5	110	460	340	11	UG/KG
1,4-DICHLOROBENZENE	SEDIMENT	5	110	460	340	11	UG/KG
1-METHYLNAPHTHALENE	SEDIMENT	5	110	460	340	3	UG/KG
1-METHYLPHENANTHRENE	SEDIMENT	5	110	460	340	3	UG/KG
2,2'-OXYBIS(1-CHLOROPROPANE)	SEDIMENT	5	110	460	340	11	UG/KG
2,3,5-TRIMETHYLNAPHTHALENE	SEDIMENT	5	110	460	340	3	UG/KG
2,4,5-TRICHLOROPHENOL	SEDIMENT	5	270	1100	840	27	UG/KG
2,4,6-TRICHLOROPHENOL	SEDIMENT	5	110	460	340	11	UG/KG
2,4-DICHLOROPHENOL	SEDIMENT	5	110	460	340	11	UG/KG
2,4-DIMETHYLPHENOL	SEDIMENT	5	110	460	340	11	UG/KG
2,4-DINITROPHENOL	SEDIMENT	5	270	1100	840	27	UG/KG
2,4-DINITROTOLUENE	SEDIMENT	5	110	460	340	11	UG/KG
2,6-DIMETHYLNAPHTHALENE	SEDIMENT	5	110	460	340	3	UG/KG
2,6-DINITROTOLUENE	SEDIMENT	5	110	460	340	11	UG/KG
2-CHLORONAPHTHALENE	SEDIMENT	5	110	460	340	11	UG/KG
2-CHLOROPHENOL	SEDIMENT	5	110	460	340	11	UG/KG
2-METHYLNAPHTHALENE	SEDIMENT	5	110	460	340	11	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
2-METHYLPHENOL	SEDIMENT	5	110	460	340	11	UG/KG
2-NITROANILINE	SEDIMENT	5	270	1100	840	27	UG/KG
2-NITROPHENOL	SEDIMENT	5	110	460	340	11	UG/KG
3,3'-DICHLOROBENZIDINE	SEDIMENT	5	110	460	340	11	UG/KG
3-NITROANILINE	SEDIMENT	5	270	1100	840	27	UG/KG
4,6-DINITRO-2-METHYLPHENOL	SEDIMENT	5	270	1100	840	27	UG/KG
4-BROMOPHENYL-PHENYLETHER	SEDIMENT	5	110	460	340	11	UG/KG
4-CHLORO-3-METHYLPHENOL	SEDIMENT	5	110	460	340	11	UG/KG
4-CHLOROANILINE	SEDIMENT	5	110	460	340	11	UG/KG
4-CHLOROPHENYL-PHENYLETHER	SEDIMENT	5	110	460	340	11	UG/KG
4-METHYLPHENOL	SEDIMENT	5	110	460	340	11	UG/KG
4-NITROANILINE	SEDIMENT	5	270	1100	840	27	UG/KG
4-NITROPHENOL	SEDIMENT	5	270	1100	840	27	UG/KG
ACENAPHTHENE	SEDIMENT	5	110	460	340	11	UG/KG
ACENAPHTHYLENE	SEDIMENT	5	110	460	340	11	UG/KG
ANTHRACENE	SEDIMENT	5	110	460	340	11	UG/KG
BENZO(A)ANTHRACENE	SEDIMENT	5	110	460	340	11	UG/KG
BENZO(A)PYRENE	SEDIMENT	5	110	460	340	11	UG/KG
BENZO(B)FLUORANTHENE	SEDIMENT	5	110	460	340	11	UG/KG
BENZO(E)PYRENE	SEDIMENT	5	110	460	340	3	UG/KG
BENZO(G,H,I)PERYLENE	SEDIMENT	5	110	460	340	11	UG/KG
BENZO(K)FLUORANTHENE	SEDIMENT	5	110	460	340	11	UG/KG
BENZOIC ACID	SEDIMENT	5	270	1100	840	3	UG/KG
BENZYL ALCOHOL	SEDIMENT	5	110	460	340	3	UG/KG
BIS(2-CHLOROETHOXY)METHANE	SEDIMENT	5	110	460	340	11	UG/KG
BIS(2-CHLOROETHYL)ETHER	SEDIMENT	5	110	460	340	11	UG/KG
BIS(2-ETHYLHEXYL)PHTHALATE	SEDIMENT	5	110	460	340	11	UG/KG
BUTYLBENZYLPHTHALATE	SEDIMENT	5	110	460	340	11	UG/KG
CARBAZOLE	SEDIMENT	5	110	460	340	11	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
CHRYSENE	SEDIMENT	5	110	460	340	11	UG/KG
DI-N-BUTYLPHTHALATE	SEDIMENT	5	110	460	340	11	UG/KG
DI-N-OCTYLPHTHALATE	SEDIMENT	5	110	460	340	11	UG/KG
DIBENZ(A,H)ANTHRACENE	SEDIMENT	5	110	460	340	11	UG/KG
DIBENZOFURAN	SEDIMENT	5	110	460	340	11	UG/KG
DIBENZOTHIOPHENE	SEDIMENT	5	110	460	340	3	UG/KG
DIETHYLPHTHALATE	SEDIMENT	5	110	460	340	11	UG/KG
DIMETHYLPHTHALATE	SEDIMENT	5	110	460	340	11	UG/KG
FLUORANTHENE	SEDIMENT	5	110	460	340	11	UG/KG
FLUORENE	SEDIMENT	5	110	460	340	11	UG/KG
HEXACHLOROBENZENE	SEDIMENT	5	110	460	340	11	UG/KG
HEXACHLOROBUTADIENE	SEDIMENT	5	110	460	340	11	UG/KG
HEXACHLOROCYCLOPENTADIENE	SEDIMENT	5	110	460	340	11	UG/KG
HEXACHLOROETHANE	SEDIMENT	5	110	460	340	11	UG/KG
INDENO(1,2,3-CD)PYRENE	SEDIMENT	5	110	460	340	11	UG/KG
ISOPHORONE	SEDIMENT	5	110	460	340	11	UG/KG
N-NITROSO-DI-N-PROPYLAMINE	SEDIMENT	5	110	460	340	11	UG/KG
N-NITROSODIPHENYLAMINE (1)	SEDIMENT	5	110	460	340	11	UG/KG
NAPHTHALENE	SEDIMENT	5	110	460	340	11	UG/KG
NITROBENZENE	SEDIMENT	5	110	460	340	11	UG/KG
PENTACHLOROPHENOL	SEDIMENT	5	270	1100	840	27	UG/KG
PERYLENE	SEDIMENT	5	110	460	340	3	UG/KG
PHENANTHRENE	SEDIMENT	5	110	460	340	11	UG/KG
PHENOL	SEDIMENT	5	110	460	340	11	UG/KG
PYRENE	SEDIMENT	5	110	460	340	11	UG/KG
1,1'-BIPHENYL	SOIL	129	34	22000	660	3	UG/KG
1,2,4-TRICHLOROBENZENE	SOIL	129	34	22000	660	11	UG/KG
1,2-DICHLOROBENZENE	SOIL	129	34	22000	660	11	UG/KG
1,3-DICHLOROBENZENE	SOIL	129	34	22000	660	11	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
1,4-DICHLOROBENZENE	SOIL	129	34	22000	660	11	UG/KG
1-METHYLNAPHTHALENE	SOIL	129	34	22000	660	3	UG/KG
1-METHYLPHENANTHRENE	SOIL	129	34	22000	660	3	UG/KG
2,2'-OXYBIS(1-CHLOROPROPANE)	SOIL	129	34	22000	660	11	UG/KG
2,3,5-TRIMETHYLNAPHTHALENE	SOIL	129	34	22000	660	3	UG/KG
2,4,5-TRICHLOROPHENOL	SOIL	129	86	53000	1600	27	UG/KG
2,4,6-TRICHLOROPHENOL	SOIL	129	34	22000	660	11	UG/KG
2,4-DICHLOROPHENOL	SOIL	129	34	22000	660	11	UG/KG
2,4-DIMETHYLPHENOL	SOIL	129	34	22000	660	11	UG/KG
2,4-DINITROPHENOL	SOIL	129	86	53000	1600	27	UG/KG
2,4-DINITROTOLUENE	SOIL	129	34	22000	660	11	UG/KG
2,6-DIMETHYLNAPHTHALENE	SOIL	129	34	22000	660	3	UG/KG
2,6-DINITROTOLUENE	SOIL	129	34	22000	660	11	UG/KG
2-CHLORONAPHTHALENE	SOIL	129	34	22000	660	11	UG/KG
2-CHLOROPHENOL	SOIL	129	34	22000	660	11	UG/KG
2-METHYLNAPHTHALENE	SOIL	129	34	22000	660	11	UG/KG
2-METHYLPHENOL	SOIL	129	34	22000	660	11	UG/KG
2-NITROANILINE	SOIL	129	86	53000	1600	27	UG/KG
2-NITROPHENOL	SOIL	129	34	22000	660	11	UG/KG
3,3'-DICHLOROBENZIDINE	SOIL	129	34	22000	660	11	UG/KG
3-NITROANILINE	SOIL	129	86	53000	1600	27	UG/KG
4,6-DINITRO-2-METHYLPHENOL	SOIL	129	86	53000	1600	27	UG/KG
4-BROMOPHENYL-PHENYLETHER	SOIL	129	34	22000	660	11	UG/KG
4-CHLORO-3-METHYLPHENOL	SOIL	129	34	22000	660	11	UG/KG
4-CHLOROANILINE	SOIL	129	34	22000	660	11	UG/KG
4-CHLOROPHENYL-PHENYLETHER	SOIL	129	34	22000	660	11	UG/KG
4-METHYLPHENOL	SOIL	129	34	22000	660	11	UG/KG
4-NITROANILINE	SOIL	129	86	53000	1600	27	UG/KG
4-NITROPHENOL	SOIL	129	86	53000	1600	27	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
ACENAPHTHENE	SOIL	129	34	22000	660	11	UG/KG
ACENAPHTHYLENE	SOIL	129	34	22000	660	11	UG/KG
ANTHRACENE	SOIL	129	34	22000	660	11	UG/KG
BENZO(A)ANTHRACENE	SOIL	129	34	22000	680	11	UG/KG
BENZO(A)PYRENE	SOIL	129	34	22000	680	11	UG/KG
BENZO(B)FLUORANTHENE	SOIL	129	34	22000	680	11	UG/KG
BENZO(E)PYRENE	SOIL	129	34	22000	680	3	UG/KG
BENZO(G,H,I)PERYLENE	SOIL	129	34	22000	660	11	UG/KG
BENZO(K)FLUORANTHENE	SOIL	129	34	22000	680	11	UG/KG
BENZOIC ACID	SOIL	129	86	53000	1600	3	UG/KG
BENZYL ALCOHOL	SOIL	129	34	22000	660	3	UG/KG
BIS(2-CHLOROETHOXY)METHANE	SOIL	129	34	22000	660	11	UG/KG
BIS(2-CHLOROETHYL)ETHER	SOIL	129	34	22000	660	11	UG/KG
BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	129	34	22000	660	11	UG/KG
BUTYLBENZYLPHTHALATE	SOIL	129	34	22000	660	11	UG/KG
CARBAZOLE	SOIL	129	34	22000	660	11	UG/KG
CHRYSENE	SOIL	129	34	22000	680	11	UG/KG
DI-N-BUTYLPHTHALATE	SOIL	129	34	22000	660	11	UG/KG
DI-N-OCTYLPHTHALATE	SOIL	129	34	22000	660	11	UG/KG
DIBENZ(A,H)ANTHRACENE	SOIL	129	34	22000	660	11	UG/KG
DIBENZOFURAN	SOIL	129	34	22000	660	11	UG/KG
DIBENZOTHIOPHENE	SOIL	129	34	22000	660	3	UG/KG
DIETHYLPHTHALATE	SOIL	129	34	22000	660	11	UG/KG
DIMETHYLPHTHALATE	SOIL	129	34	22000	660	11	UG/KG
FLUORANTHENE	SOIL	129	34	22000	680	11	UG/KG
FLUORENE	SOIL	129	34	22000	660	11	UG/KG
HEXACHLOROBENZENE	SOIL	129	34	22000	660	11	UG/KG
HEXACHLOROBUTADIENE	SOIL	129	34	22000	660	11	UG/KG
HEXACHLOROCYCLOPENTADIENE	SOIL	129	34	22000	660	11	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
HEXACHLOROETHANE	SOIL	129	34	22000	660	11	UG/KG
INDENO(1,2,3-CD)PYRENE	SOIL	129	34	22000	660	11	UG/KG
ISOPHORONE	SOIL	129	34	22000	660	11	UG/KG
N-NITROSO-DI-N-PROPYLAMINE	SOIL	129	34	22000	660	11	UG/KG
N-NITROSODIPHENYLAMINE (1)	SOIL	129	34	22000	660	11	UG/KG
NAPHTHALENE	SOIL	129	34	22000	660	11	UG/KG
NITROBENZENE	SOIL	129	34	22000	660	11	UG/KG
PENTACHLOROPHENOL	SOIL	129	86	53000	1600	27	UG/KG
PERYLENE	SOIL	129	34	22000	660	3	UG/KG
PHENANTHRENE	SOIL	129	34	22000	680	11	UG/KG
PHENOL	SOIL	129	34	22000	660	11	UG/KG
PYRENE	SOIL	129	34	22000	680	11	UG/KG
CLP Pesticides:							
4,4'-DDD	SOIL	100	4	73	9	3.3	UG/KG
4,4'-DDE	SOIL	100	4	73	9	3.3	UG/KG
4,4'-DDT	SOIL	100	4	73	9	3.3	UG/KG
ALDRIN	SOIL	100	2	36	5	1.7	UG/KG
ALPHA-BHC	SOIL	100	2	36	5	1.7	UG/KG
ALPHA-CHLORDANE	SOIL	100	2	36	5	1.7	UG/KG
AROCLOR-1016	SOIL	100	20	730	94	33	UG/KG
AROCLOR-1221	SOIL	100	20	1500	190	67	UG/KG
AROCLOR-1232	SOIL	100	20	730	94	33	UG/KG
AROCLOR-1242	SOIL	100	20	730	94	33	UG/KG
AROCLOR-1248	SOIL	100	20	730	94	33	UG/KG
AROCLOR-1254	SOIL	100	20	730	94	33	UG/KG
AROCLOR-1260	SOIL	100	20	730	94	33	UG/KG
BETA-BHC	SOIL	100	2	36	5	1.7	UG/KG
DELTA-BHC	SOIL	100	2	36	5	1.7	UG/KG
DIELDRIN	SOIL	100	4	73	9	3.3	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
ENDOSULFAN I	SOIL	100	2	36	5	1.7	UG/KG
ENDOSULFAN II	SOIL	100	4	73	9	3.3	UG/KG
ENDOSULFAN SULFATE	SOIL	100	4	73	9	3.3	UG/KG
ENDRIN	SOIL	100	4	73	9	3.3	UG/KG
ENDRIN ALDEHYDE	SOIL	100	4	73	9	3.3	UG/KG
ENDRIN KETONE	SOIL	100	4	73	9	3.3	UG/KG
GAMMA-BHC (LINDANE)	SOIL	100	2	36	5	1.7	UG/KG
GAMMA-CHLORDANE	SOIL	100	2	36	5	1.7	UG/KG
HEPTACHLOR	SOIL	100	2	36	5	1.7	UG/KG
HEPTACHLOR EPOXIDE	SOIL	100	0.4	36	5	1.7	UG/KG
METHOXYCHLOR	SOIL	100	18	360	47	17	UG/KG
TOXAPHENE	SOIL	100	120	3600	470	170	UG/KG
4,4'-DDD	SWATER	60	0.1	0.5	0.1	0.10	UG/L
4,4'-DDE	SWATER	60	0.1	0.5	0.1	0.10	UG/L
4,4'-DDT	SWATER	60	0.1	0.5	0.1	0.10	UG/L
ALDRIN	SWATER	60	0.05	0.3	0.05	0.05	UG/L
ALPHA-BHC	SWATER	60	0.05	0.3	0.05	0.05	UG/L
ALPHA-CHLORDANE	SWATER	60	0.05	0.3	0.05	0.05	UG/L
AROCLOR-1016	SWATER	60	0.5	3	0.5	0.50	UG/L
AROCLOR-1221	SWATER	60	0.5	3	0.5	0.50	UG/L
AROCLOR-1232	SWATER	60	0.5	3	0.5	0.50	UG/L
AROCLOR-1242	SWATER	60	0.5	3	0.5	0.50	UG/L
AROCLOR-1248	SWATER	60	0.5	3	0.5	0.50	UG/L
AROCLOR-1254	SWATER	60	0.5	3	0.5	0.50	UG/L
AROCLOR-1260	SWATER	60	0.5	3	0.5	0.50	UG/L
BETA-BHC	SWATER	60	0.05	0.3	0.05	0.05	UG/L
DELTA-BHC	SWATER	60	0.05	0.3	0.05	0.05	UG/L
DIELDRIN	SWATER	60	0.1	0.5	0.1	0.10	UG/L
ENDOSULFAN I	SWATER	60	0.05	0.3	0.05	0.05	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
ENDOSULFAN II	SWATER	60	0.1	0.5	0.1	0.10	UG/L
ENDOSULFAN SULFATE	SWATER	60	0.1	0.5	0.1	0.10	UG/L
ENDRIN	SWATER	60	0.1	0.5	0.1	0.10	UG/L
ENDRIN ALDEHYDE	SWATER	60	0.1	0.5	0.1	0.10	UG/L
ENDRIN KETONE	SWATER	60	0.1	0.5	0.1	0.10	UG/L
GAMMA-BHC (LINDANE)	SWATER	60	0.05	0.3	0.05	0.05	UG/L
GAMMA-CHLORDANE	SWATER	60	0.05	0.3	0.05	0.05	UG/L
HEPTACHLOR	SWATER	60	0.05	0.3	0.05	0.05	UG/L
HEPTACHLOR EPOXIDE	SWATER	60	0.01	0.05	0.01	0.01	UG/L
METHOXYCHLOR	SWATER	60	0.5	3	0.5	0.50	UG/L
TOXAPHENE	SWATER	60	3	15	3	3.0	UG/L
4,4'-DDD	WATER	2	0.1	0.1	0.1	0.10	UG/L
4,4'-DDE	WATER	2	0.1	0.1	0.1	0.10	UG/L
4,4'-DDT	WATER	2	0.1	0.1	0.1	0.10	UG/L
ALDRIN	WATER	2	0.05	0.05	0.05	0.05	UG/L
ALPHA-BHC	WATER	2	0.05	0.05	0.05	0.05	UG/L
ALPHA-CHLORDANE	WATER	2	0.05	0.05	0.05	0.05	UG/L
AROCLOR-1016	WATER	2	0.5	0.5	0.5	0.50	UG/L
AROCLOR-1221	WATER	2	0.5	0.5	0.5	0.50	UG/L
AROCLOR-1232	WATER	2	0.5	0.5	0.5	0.50	UG/L
AROCLOR-1242	WATER	2	0.5	0.5	0.5	0.50	UG/L
AROCLOR-1248	WATER	2	0.5	0.5	0.5	0.50	UG/L
AROCLOR-1254	WATER	2	0.5	0.5	0.5	0.50	UG/L
AROCLOR-1260	WATER	2	0.5	0.5	0.5	0.50	UG/L
BETA-BHC	WATER	2	0.05	0.05	0.05	0.05	UG/L
DELTA-BHC	WATER	2	0.05	0.05	0.05	0.05	UG/L
DIELDRIN	WATER	2	0.1	0.1	0.1	0.10	UG/L
ENDOSULFAN I	WATER	2	0.05	0.05	0.05	0.05	UG/L
ENDOSULFAN II	WATER	2	0.1	0.1	0.1	0.10	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
ENDOSULFAN SULFATE	WATER	2	0.1	0.1	0.1	0.10	UG/L
ENDRIN	WATER	2	0.1	0.1	0.1	0.10	UG/L
ENDRIN ALDEHYDE	WATER	2	0.1	0.1	0.1	0.10	UG/L
ENDRIN KETONE	WATER	2	0.1	0.1	0.1	0.10	UG/L
GAMMA-BHC (LINDANE)	WATER	2	0.05	0.05	0.05	0.05	UG/L
GAMMA-CHLORDANE	WATER	2	0.05	0.05	0.05	0.05	UG/L
HEPTACHLOR	WATER	2	0.05	0.05	0.05	0.05	UG/L
HEPTACHLOR EPOXIDE	WATER	2	0.01	0.01	0.01	0.01	UG/L
METHOXYCHLOR	WATER	2	0.5	0.5	0.5	0.50	UG/L
TOXAPHENE	WATER	2	3	3	3	3.0	UG/L
Low Level CLP Pesticides:							
2,4'-DDD	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
2,4'-DDE	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
2,4'-DDT	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
4,4'-DDD	SEDIMENT	5	0.2	0.5	0.3	0.2	UG/KG
4,4'-DDE	SEDIMENT	5	0.2	0.5	0.3	0.2	UG/KG
4,4'-DDT	SEDIMENT	5	0.2	0.5	0.3	0.2	UG/KG
ALDRIN	SEDIMENT	5	0.2	0.5	0.3	0.1	UG/KG
ALPHA-CHLORDANE	SEDIMENT	5	0.2	0.5	0.3	0.1	UG/KG
DIELDRIN	SEDIMENT	5	0.2	0.5	0.3	0.2	UG/KG
GAMMA-BHC (LINDANE)	SEDIMENT	5	0.2	0.5	0.3	0.1	UG/KG
HEPTACHLOR	SEDIMENT	5	0.2	0.5	0.3	0.1	UG/KG
HEPTACHLOR EPOXIDE	SEDIMENT	5	0.2	0.5	0.3	0.1	UG/KG
HEXACHLOROBENZENE	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
MIREX	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-101 (2,2',3,5,5')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-105 (2,3,3',4,4')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-118 (2,3',4,4',5)	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-126 (3,3',4,4',5)	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
PCB-128 (2,2',3,3',4,4')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-138 (2,2',3,4,4',5')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-153 (2,2',4,4',5,5')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-170 (2,2',3,3',4,4',5)	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-18 (2,2',5)	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-180 (2,2',3,4,4',5,5')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-187 (2,2',3,4',5,5',6)	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-195 (2,2',3,3',4,4',5,6)	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-206 (2,2,',3,3',4,4',5,5',	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-209 (2,2',3,3',4,4',5,5',6	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-28 (2,4,4')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-44 (2,2',3,5')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-52 (2,2',5,5')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-66 (2,3',4,4')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-77 (3,3',4,4')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
PCB-8 (2,4')	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
TRANS-NONACHLOR	SEDIMENT	5	0.2	0.5	0.3	1.1	UG/KG
2,4'-DDD	SOIL	129	0.1	7	0.4	1.1	UG/KG
2,4'-DDE	SOIL	129	0.1	7	0.4	1.1	UG/KG
2,4'-DDT	SOIL	129	0.1	7	0.4	1.1	UG/KG
4,4'-DDD	SOIL	129	0.1	7	0.4	0.2	UG/KG
4,4'-DDE	SOIL	129	0.1	7	0.4	0.2	UG/KG
4,4'-DDT	SOIL	129	0.1	7	0.4	0.2	UG/KG
ALDRIN	SOIL	129	0.1	7	0.4	0.1	UG/KG
ALPHA-CHLORDANE	SOIL	129	0.1	7	0.4	0.1	UG/KG
DIELDRIN	SOIL	129	0.1	7	0.4	0.2	UG/KG
GAMMA-BHC (LINDANE)	SOIL	129	0.1	7	0.4	0.1	UG/KG
HEPTACHLOR	SOIL	129	0.1	7	0.4	0.1	UG/KG
HEPTACHLOR EPOXIDE	SOIL	129	0.1	7	0.4	0.1	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
HEXACHLOROBENZENE	SOIL	129	0.1	7	0.4	1.1	UG/KG
MIREX	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-101 (2,2',3,5,5')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-105 (2,3,3',4,4')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-118 (2,3',4,4',5)	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-126 (3,3',4,4',5)	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-128 (2,2',3,3',4,4')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-138 (2,2',3,4,4',5')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-153 (2,2',4,4',5,5')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-170 (2,2',3,3',4,4',5)	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-18 (2,2',5)	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-180 (2,2',3,4,4',5,5')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-187 (2,2',3,4',5,5',6)	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-195 (2,2',3,3',4,4',5,6)	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-206 (2,2,',3,3',4,4',5,5',	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-209 (2,2',3,3',4,4',5,5',6	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-28 (2,4,4')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-44 (2,2',3,5')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-52 (2,2',5,5')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-66 (2,3',4,4')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-77 (3,3',4,4')	SOIL	129	0.1	7	0.4	1.1	UG/KG
PCB-8 (2,4')	SOIL	129	0.1	7	0.4	1.1	UG/KG
TRANS-NONACHLOR	SOIL	129	0.1	7	0.4	1.1	UG/KG
Explosives:							
1,3,5-TRINITROBENZENE	SOIL	77	120	120	120	500	UG/KG
1,3-DINITROBENZENE	SOIL	77	120	120	120	500	UG/KG
2,4,6-TRINITROTOLUENE	SOIL	77	120	120	120	500	UG/KG
2,4-DINITROTOLUENE	SOIL	77	120	120	120	500	UG/KG
2,6-DINITROTOLUENE	SOIL	77	120	120	120	500	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
2-NITROTOLUENE	SOIL	77	120	120	120	500	UG/KG
3-NITROTOLUENE	SOIL	77	120	120	120	500	UG/KG
4-NITROTOLUENE	SOIL	77	120	120	120	500	UG/KG
HMX	SOIL	77	120	120	120	500	UG/KG
NITROBENZENE	SOIL	77	120	120	120	500	UG/KG
RDX	SOIL	77	120	120	120	500	UG/KG
TETRYL	SOIL	77	120	120	120	500	UG/KG
1,3,5-TRINITROBENZENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
1,3-DINITROBENZENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
2,4,6-TRINITROTOLUENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
2,4-DINITROTOLUENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
2,6-DINITROTOLUENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
2-NITROTOLUENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
3-NITROTOLUENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
4-NITROTOLUENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
HMX	SWATER	60	0.1	0.1	0.1	0.5	UG/L
NITROBENZENE	SWATER	60	0.1	0.1	0.1	0.5	UG/L
RDX	SWATER	60	0.1	0.1	0.1	0.5	UG/L
TETRYL	SWATER	60	0.1	0.1	0.1	0.5	UG/L
1,3,5-TRINITROBENZENE	WATER	2	0.1	0.1	0.1	0.5	UG/L
1,3-DINITROBENZENE	WATER	2	0.1	0.1	0.1	0.5	UG/L
2,4,6-TRINITROTOLUENE	WATER	2	0.1	0.1	0.1	0.5	UG/L
2,4-DINITROTOLUENE	WATER	2	0.1	0.1	0.1	0.5	UG/L
2,6-DINITROTOLUENE	WATER	2	0.1	0.1	0.1	0.5	UG/L
2-NITROTOLUENE	WATER	2	0.1	0.1	0.1	0.5	UG/L
3-NITROTOLUENE	WATER	2	0.1	0.1	0.1	0.5	UG/L
4-NITROTOLUENE	WATER	2	0.1	0.1	0.1	0.5	UG/L
HMX	WATER	2	0.1	0.1	0.1	0.5	UG/L
NITROBENZENE	WATER	2	0.1	0.1	0.1	0.5	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
RDX	WATER	2	0.1	0.1	0.1	0.5	UG/L
TETRYL	WATER	2	0.1	0.1	0.1	0.5	UG/L
TPH-:							
DIESEL	SOIL	25	12	1400	170	10	MG/KG
GASOLINE	SOIL	7	0.6	6	1	0.5	MG/KG
MOTOR OIL	SOIL	25	12	1400	170	10	MG/KG
DIESEL	SWATER	5	0.1	1	0.3	0.1	MG/L
MOTOR OIL	SWATER	5	0.1	1	0.3	0.1	MG/L
Dioxins:							
1,2,3,4,6,7,8-HPCDD	SOIL	2	0.06	0.06	0.06	1	UG/KG
1,2,3,4,6,7,8-HPCDF	SOIL	2	0.08	0.08	0.08	1	UG/KG
1,2,3,4,7,8,9-HPCDF	SOIL	2	0.04	0.08	0.06	1	UG/KG
1,2,3,4,7,8-HXCDD	SOIL	2	0.05	0.07	0.06	0.5	UG/KG
1,2,3,4,7,8-HXCDF	SOIL	2	0.02	0.06	0.04	0.5	UG/KG
1,2,3,6,7,8-HXCDD	SOIL	2	0.05	0.07	0.06	0.5	UG/KG
1,2,3,6,7,8-HXCDF	SOIL	2	0.02	0.06	0.04	0.5	UG/KG
1,2,3,7,8,9-HXCDD	SOIL	2	0.05	0.07	0.06	0.5	UG/KG
1,2,3,7,8,9-HXCDF	SOIL	2	0.02	0.06	0.04	0.5	UG/KG
1,2,3,7,8-PECDD	SOIL	2	0.06	0.08	0.07	0.1	UG/KG
1,2,3,7,8-PECDF	SOIL	2	0.04	0.09	0.06	0.1	UG/KG
2,3,4,6,7,8-HXCDF	SOIL	2	0.02	0.06	0.04	0.5	UG/KG
2,3,4,7,8-PECDF	SOIL	2	0.04	0.09	0.06	0.1	UG/KG
2,3,7,8-TCDF	SOIL	2	0.06	0.1	0.08	0.1	UG/KG
2,3,7,8-TETRACHLORODIBENZO-P-D	SOIL	2	0.02	0.03	0.02	0.1	UG/KG
HPCDDS (TOTAL)	SOIL	2	0.1	0.1	0.1	1	UG/KG
HPCDFS (TOTAL)	SOIL	2	0.08	0.08	0.08	1	UG/KG
HXCDDS (TOTAL)	SOIL	2	0.05	0.07	0.06	0.5	UG/KG
HXCDFS (TOTAL)	SOIL	2	0.06	0.2	0.1	0.5	UG/KG
OCDD	SOIL	2	0.2	0.2	0.2	1	UG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
OCDF	SOIL	2	0.08	0.2	0.2	1	UG/KG
PECDDS (TOTAL)	SOIL	2	0.06	0.08	0.07	0.1	UG/KG
PECDFS (TOTAL)	SOIL	2	0.04	0.09	0.06	0.1	UG/KG
TCDDS (TOTAL)	SOIL	2	0.02	0.03	0.02	0.1	UG/KG
TCDFS (TOTAL)	SOIL	2	0.06	0.1	0.08	0.1	UG/KG
CLP Metals:							
ALUMINUM	SEDIMENT	5	3.1	10.2	5.6	10	MG/KG
ANTIMONY	SEDIMENT	5	0.70	1.3	0.95	1.2	MG/KG
ARSENIC	SEDIMENT	5	0.67	1.8	1.1	2.0	MG/KG
BARIUM	SEDIMENT	5	0.11	1.7	0.88	40	MG/KG
BERYLLIUM	SEDIMENT	5	0.04	0.10	0.07	0.8	MG/KG
CADMIUM	SEDIMENT	5	0.07	0.15	0.11	0.2	MG/KG
CALCIUM	SEDIMENT	5	5.4	43.1	23.9	1000	MG/KG
CHROMIUM	SEDIMENT	5	0.16	1.1	0.48	2.0	MG/KG
COBALT	SEDIMENT	5	0.19	0.50	0.34	10	MG/KG
COPPER	SEDIMENT	5	0.22	0.50	0.33	0.8	MG/KG
IRON	SEDIMENT	5	5.9	9.8	7.6	20	MG/KG
LEAD	SEDIMENT	5	0.48	0.94	0.66	0.6	MG/KG
MAGNESIUM	SEDIMENT	5	6.1	45.8	25.6	1000	MG/KG
MANGANESE	SEDIMENT	5	0.13	0.38	0.22	3.0	MG/KG
MERCURY	SEDIMENT	5	0.02	0.10	0.05	0.2	MG/KG
MOLYBDENUM	SEDIMENT	5	0.34	0.69	0.52	1.0	MG/KG
NICKEL	SEDIMENT	5	0.32	2.1	0.90	1.6	MG/KG
POTASSIUM	SEDIMENT	5	10.4	52.1	30.9	1000	MG/KG
SELENIUM	SEDIMENT	5	1.2	2.1	1.6	1.0	MG/KG
SILVER	SEDIMENT	5	0.22	0.40	0.31	0.4	MG/KG
SODIUM	SEDIMENT	5	47.8	99.1	73.8	1000	MG/KG
THALLIUM	SEDIMENT	5	0.51	1.2	0.75	0.4	MG/KG
VANADIUM	SEDIMENT	5	0.22	0.54	0.38	10	MG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
ZINC	SEDIMENT	5	0.11	0.20	0.16	4.0	MG/KG
ALUMINUM	SOIL	294	1.3	25.3	6.0	10	MG/KG
ANTIMONY	SOIL	294	0.39	4.9	0.84	1.2	MG/KG
ARSENIC	SOIL	294	0.30	4.3	1.0	2.0	MG/KG
BARIUM	SOIL	294	0.06	3.5	0.19	40	MG/KG
BERYLLIUM	SOIL	294	0.01	0.18	0.04	0.8	MG/KG
CADMIUM	SOIL	294	0.02	0.31	0.08	0.2	MG/KG
CALCIUM	SOIL	294	2.5	81.2	6.9	1000	MG/KG
CHROMIUM	SOIL	294	0.21	2.8	0.66	2.0	MG/KG
COBALT	SOIL	294	0.08	0.91	0.20	10	MG/KG
COPPER	SOIL	294	0.11	1.2	0.31	0.8	MG/KG
IRON	SOIL	294	2.1	26.4	6.1	20	MG/KG
LEAD	SOIL	294	0.27	2.3	0.58	0.6	MG/KG
MAGNESIUM	SOIL	294	1.1	84.4	7.4	1000	MG/KG
MANGANESE	SOIL	294	0.04	0.93	0.22	3.0	MG/KG
MERCURY	SOIL	294	0.01	0.39	0.08	0.2	MG/KG
MOLYBDENUM	SOIL	294	0.17	1.9	0.36	1.0	MG/KG
NICKEL	SOIL	294	0.26	5.1	1.2	1.6	MG/KG
POTASSIUM	SOIL	294	5.6	96.0	11.6	1000	MG/KG
SELENIUM	SOIL	294	0.48	5.3	1.3	1.0	MG/KG
SILVER	SOIL	294	0.11	1.6	0.25	0.4	MG/KG
SODIUM	SOIL	294	25.6	283	52.1	1000	MG/KG
THALLIUM	SOIL	294	0.08	4.7	0.76	0.4	MG/KG
VANADIUM	SOIL	294	0.12	1.2	0.24	10	MG/KG
ZINC	SOIL	294	0.06	0.87	0.13	4.0	MG/KG
ALUMINUM	SWATER	60	16.3	19.1	17.8	50	UG/L
ANTIMONY	SWATER	60	1.6	8.0	2.2	6	UG/L
ARSENIC	SWATER	60	1.4	7.0	2.3	10	UG/L
BARIUM	SWATER	60	0.30	1.5	0.34	200	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
BERYLLIUM	SWATER	60	0.10	0.50	0.11	4	UG/L
CADMIUM	SWATER	60	0.20	1.0	0.21	1	UG/L
CALCIUM	SWATER	60	8.2	71.0	13.9	5000	UG/L
CHROMIUM	SWATER	60	0.40	2.5	0.97	10	UG/L
COBALT	SWATER	60	0.40	2.0	0.49	50	UG/L
COPPER	SWATER	60	0.50	2.5	0.71	4	UG/L
IRON	SWATER	60	11.0	55.0	14.1	100	UG/L
LEAD	SWATER	60	0.80	4.0	1.2	3	UG/L
MAGNESIUM	SWATER	60	16.3	261	40.2	5000	UG/L
MANGANESE	SWATER	60	0.10	0.60	0.33	15	UG/L
MERCURY	SWATER	60	0.10	0.10	0.10	0.2	UG/L
MOLYBDENUM	SWATER	60	0.60	3.0	0.88	5	UG/L
NICKEL	SWATER	60	0.70	3.5	1.8	8	UG/L
POTASSIUM	SWATER	60	484	5990	1080	5000	UG/L
SELENIUM	SWATER	60	2.3	11.5	3.2	5	UG/L
SILVER	SWATER	60	0.50	2.5	0.61	2	UG/L
SODIUM	SWATER	60	25.7	257	107	5000	UG/L
THALLIUM	SWATER	60	1.9	9.5	2.1	2	UG/L
VANADIUM	SWATER	60	0.40	2.0	0.59	50	UG/L
ZINC	SWATER	60	0.30	5.0	0.85	20	UG/L
ALUMINUM	WATER	2	6.3	6.3	6.3	50	UG/L
ANTIMONY	WATER	2	9.5	9.5	9.5	6	UG/L
ARSENIC	WATER	3	1.4	2.8	1.9	10	UG/L
BARIUM	WATER	2	0.40	0.40	0.40	200	UG/L
BERYLLIUM	WATER	2	0.10	0.10	0.10	4	UG/L
CADMIUM	WATER	2	0.10	0.10	0.10	1	UG/L
CALCIUM	WATER	2	11.9	11.9	11.9	5000	UG/L
CHROMIUM	WATER	2	1.0	1.0	1.0	10	UG/L
COBALT	WATER	2	0.40	0.40	0.40	50	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
COPPER	WATER	2	0.50	0.50	0.50	4	UG/L
IRON	WATER	2	10.1	10.1	10.1	100	UG/L
LEAD	WATER	2	1.3	1.3	1.3	3	UG/L
MAGNESIUM	WATER	2	5.1	5.1	5.1	5000	UG/L
MANGANESE	WATER	2	0.20	0.20	0.20	15	UG/L
MERCURY	WATER	2	0.10	0.10	0.10	0.2	UG/L
MOLYBDENUM	WATER	2	0.80	4.0	2.4	5	UG/L
NICKEL	WATER	2	1.3	1.3	1.3	8	UG/L
POTASSIUM	WATER	2	43.9	43.9	43.9	5000	UG/L
SELENIUM	WATER	2	17.5	17.5	17.5	5	UG/L
SILVER	WATER	2	2.5	2.5	2.5	2	UG/L
SODIUM	WATER	2	129	129	129	5000	UG/L
THALLIUM	WATER	2	1.5	7.5	4.5	2	UG/L
VANADIUM	WATER	2	0.70	0.70	0.70	50	UG/L
ZINC	WATER	2	0.30	0.30	0.30	20	UG/L
WET Acid CLP Metals:							
ALUMINUM	SEDIMENT	5	12.1	16.3	13.8	250	UG/L
ANTIMONY	SEDIMENT	5	2.1	2.4	2.3	30	UG/L
ARSENIC	SEDIMENT	5	2.1	2.8	2.4	50	UG/L
BARIUM	SEDIMENT	5	0.30	3.2	2.0	1000	UG/L
BERYLLIUM	SEDIMENT	5	0.07	0.10	0.08	20	UG/L
CADMIUM	SEDIMENT	5	0.20	0.20	0.20	5	UG/L
CALCIUM	SEDIMENT	5	14.4	74.5	50.3	25000	UG/L
CHROMIUM	SEDIMENT	5	1.3	1.8	1.5	50	UG/L
COBALT	SEDIMENT	5	0.50	0.80	0.68	250	UG/L
COPPER	SEDIMENT	5	0.80	1.1	0.98	20	UG/L
IRON	SEDIMENT	5	15.7	243	151	500	UG/L
LEAD	SEDIMENT	5	1.5	1.7	1.6	15	UG/L
MAGNESIUM	SEDIMENT	5	16.4	68.7	47.6	25000	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
MANGANESE	SEDIMENT	5	0.30	0.60	0.42	75	UG/L
MERCURY	SEDIMENT	5	0.08	0.10	0.09	1	UG/L
MOLYBDENUM	SEDIMENT	5	0.90	1.7	1.4	25	UG/L
NICKEL	SEDIMENT	5	1.6	3.3	2.3	40	UG/L
POTASSIUM	SEDIMENT	5	27.8	38.8	34.3	25000	UG/L
SELENIUM	SEDIMENT	5	3.0	3.4	3.2	25	UG/L
SILVER	SEDIMENT	5	0.60	1.5	1.1	10	UG/L
SODIUM	SEDIMENT	5	128	2590	1140	25000	UG/L
THALLIUM	SEDIMENT	5	3.5	10.0	6.1	10	UG/L
VANADIUM	SEDIMENT	5	0.60	1.1	0.90	250	UG/L
ZINC	SEDIMENT	5	0.30	8.0	4.9	100	UG/L
ALUMINUM	SOIL	15	6.3	16.3	14.3	250	UG/L
ANTIMONY	SOIL	15	1.9	10.5	2.6	30	UG/L
ARSENIC	SOIL	15	1.4	2.8	2.5	50	UG/L
BARIUM	SOIL	15	0.30	0.40	0.32	1000	UG/L
BERYLLIUM	SOIL	15	0.10	0.10	0.10	20	UG/L
CADMIUM	SOIL	15	0.10	0.20	0.18	5	UG/L
CALCIUM	SOIL	15	11.9	14.4	13.9	25000	UG/L
CHROMIUM	SOIL	15	1.0	1.8	1.6	50	UG/L
COBALT	SOIL	15	0.40	0.50	0.48	250	UG/L
COPPER	SOIL	15	0.50	0.80	0.74	20	UG/L
IRON	SOIL	15	10.1	78.5	18.8	500	UG/L
LEAD	SOIL	15	1.3	1.5	1.5	15	UG/L
MAGNESIUM	SOIL	15	5.1	30.0	17.4	25000	UG/L
MANGANESE	SOIL	15	0.20	3.0	0.68	75	UG/L
MERCURY	SOIL	15	0.10	0.10	0.10	1	UG/L
MOLYBDENUM	SOIL	15	0.80	4.5	1.1	25	UG/L
NICKEL	SOIL	15	1.3	3.3	2.9	40	UG/L
POTASSIUM	SOIL	15	27.8	602	215	25000	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
SELENIUM	SOIL	15	3.4	34.0	12.1	25	UG/L
SILVER	SOIL	15	0.50	3.0	0.90	10	UG/L
SODIUM	SOIL	15	128	129	128	25000	UG/L
THALLIUM	SOIL	15	1.5	10.0	4.3	10	UG/L
VANADIUM	SOIL	15	0.60	0.70	0.62	250	UG/L
ZINC	SOIL	15	0.30	1.5	0.38	100	UG/L
WET CLP Metals:							
ALUMINUM	SEDIMENT	5	12.1	16.3	13.8	250	UG/L
ANTIMONY	SEDIMENT	5	2.1	2.4	2.3	30	UG/L
ARSENIC	SEDIMENT	5	2.1	2.8	2.4	50	UG/L
BARIUM	SEDIMENT	5	0.30	3.2	2.0	1000	UG/L
BERYLLIUM	SEDIMENT	5	0.07	0.10	0.08	20	UG/L
CADMIUM	SEDIMENT	5	0.20	0.20	0.20	5	UG/L
CALCIUM	SEDIMENT	5	14.4	74.6	50.4	25000	UG/L
CHROMIUM	SEDIMENT	5	1.3	1.8	1.5	50	UG/L
COBALT	SEDIMENT	5	0.50	0.80	0.68	250	UG/L
COPPER	SEDIMENT	5	0.80	1.1	0.98	20	UG/L
IRON	SEDIMENT	5	15.7	24.3	20.8	500	UG/L
LEAD	SEDIMENT	5	1.5	1.7	1.6	15	UG/L
MAGNESIUM	SEDIMENT	5	16.4	68.8	47.7	25000	UG/L
MANGANESE	SEDIMENT	5	0.30	0.60	0.42	75	UG/L
MERCURY	SEDIMENT	5	0.08	0.10	0.09	1	UG/L
MOLYBDENUM	SEDIMENT	5	0.90	1.7	1.4	25	UG/L
NICKEL	SEDIMENT	5	1.6	3.3	2.3	40	UG/L
POTASSIUM	SEDIMENT	5	27.8	38.9	34.4	25000	UG/L
SELENIUM	SEDIMENT	5	3.0	3.4	3.2	25	UG/L
SILVER	SEDIMENT	5	0.60	1.5	1.1	10	UG/L
SODIUM	SEDIMENT	5	128	2600	1140	25000	UG/L
THALLIUM	SEDIMENT	5	0.50	2.0	1.1	10	UG/L

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
VANADIUM	SEDIMENT	5	0.60	1.1	0.90	250	UG/L
ZINC	SEDIMENT	5	0.30	0.80	0.60	100	UG/L
ALUMINUM	SOIL	47	6.3	16.3	16.0	250	UG/L
ANTIMONY	SOIL	47	1.9	10.5	2.3	30	UG/L
ARSENIC	SOIL	47	1.4	2.8	2.8	50	UG/L
BARIUM	SOIL	47	0.30	3.2	0.36	1000	UG/L
BERYLLIUM	SOIL	47	0.07	0.10	0.10	20	UG/L
CADMIUM	SOIL	47	0.10	0.20	0.20	5	UG/L
CALCIUM	SOIL	47	11.9	73.9	15.6	25000	UG/L
CHROMIUM	SOIL	47	1.0	1.8	1.8	50	UG/L
COBALT	SOIL	47	0.40	0.79	0.50	250	UG/L
COPPER	SOIL	47	0.50	1.1	0.80	20	UG/L
IRON	SOIL	47	10.1	24.1	15.8	500	UG/L
LEAD	SOIL	47	1.3	1.7	1.5	15	UG/L
MAGNESIUM	SOIL	47	5.1	68.1	21.3	25000	UG/L
MANGANESE	SOIL	47	0.20	0.60	0.59	75	UG/L
MERCURY	SOIL	47	0.08	0.10	0.10	1	UG/L
MOLYBDENUM	SOIL	47	0.80	1.7	0.92	25	UG/L
NICKEL	SOIL	47	1.3	3.3	3.2	40	UG/L
POTASSIUM	SOIL	47	27.8	602	236	25000	UG/L
SELENIUM	SOIL	47	3.0	3.5	3.4	25	UG/L
SILVER	SOIL	47	0.50	1.5	0.62	10	UG/L
SODIUM	SOIL	47	128	2580	180	25000	UG/L
THALLIUM	SOIL	47	0.50	10.0	2.1	10	UG/L
VANADIUM	SOIL	47	0.60	1.1	0.61	250	UG/L
ZINC	SOIL	47	0.30	0.79	0.31	100	UG/L
Hexavalent Chromium:							
HEXAVALENT CHROMIUM	SOIL	50	2.0	2500	171	50	UG/KG
Sulfides:							
SULFIDE	SEDIMENT	5	0.50	1.0	0.80	5	MG/KG

TABLE K-16

DATA EVALUATION: REPORTING LIMITS (CONTINUED)
NAVAL WEAPONS STATION CONCORD

Analyte	Matrix	Number of Analytes	Minimum Reporting Limits	Maximum Reporting Limits	Average Reporting Limits	QAPP Reporting Limits Goals *	Units
SULFIDE	SOIL	201	0.50	264	24.6	5	MG/KG
SULFIDE	SWATER	3	0.10	0.20	0.13	0.01	MG/L
Total Organic Carbon:							
TOTAL ORGANIC CARBON	SEDIMENT	5	100	100	100	10	MG/KG
TOTAL ORGANIC CARBON	SOIL	228	100	135	102	10	MG/KG
TOTAL ORGANIC CARBON	SWATER	60	0.50	0.50	0.50	1	MG/L
TOTAL ORGANIC CARBON	WATER	2	0.50	0.50	0.50	1	MG/L
pH:							
PH	SEDIMENT	5				0.1	
PH	SOIL	294		1.0	0.00	0.1	
PH	WATER	3				0.1	
Total Suspended Solids:							
TOTAL SUSPENDED SOLIDS	SWATER	60	10.0	20.0	10.3	10	MG/L
Percent Moisture:							
PERCENT MOISTURE	SEDIMENT	5	1.0	1.0	0.40	0.1	%
PERCENT MOISTURE	SOIL	162		1.0	0.17	0.1	%
PERCENT SOLID	SOIL	12				0.1	%

* Quantitation limits for soil/concrete are based on wet weight; the soil/concrete quantitation limits calculated on a dry weight basis will be higher.

REFERENCES

American Public Health Association, American Water Works Association, and Water Environmental Federation (APHA). 1992. *Standard Methods for the Examination of Water and Wastewater* (SMEWW), 18th Edition. APHA Publication Office.

American Society for Testing and Materials (ASTM). 1994. "Standard Test Method for Particle Size of Soils." Method D422-63. Originally issued in 1963 and reapproved in 1990.

Federal Register. 1984. Clean Water Act. 40 CFR 136. Volume 49, Number 209. October 26.

PRC Environmental Management Inc. (PRC). 1995a. "Draft Final Quality Assurance Project Plan (QAPjP), Remedial Investigation/Feasibility Study Tidal Area Sites, Naval Weapons Station Concord, CA, Final." October.

PRC. 1995b. "Draft Final Field Sampling Plan, Remedial Investigation/Feasibility Study, Tidal Area Sites, Naval Weapons Station, Concord, CA." February.

State of California Leaking Underground Fuel Tank (LUFT) Task Force (LUST Task Force). 1989. "LUFT Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure." October.

State of California. 1990. "Waste Extraction Test." *California Code of Regulations*. Title 22, Division 4-Environmental Health, p. 66261.126. April 1.

U.S. Environmental Protection Agency (EPA). 1983. "Methods for Chemical Analysis of Water and Waste" (MCAWW) EPA-600/4-79-020. March.

EPA. 1986. "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, Draft Supplement." January.

EPA. 1987. "Data Quality Objectives for Remedial Response Activities." Volumes I and II. EPA/540/87/003 Office of Solid Waste and Energy Response (OSWER) (Directive 9355.0-7B). March.

EPA. 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, Part A." OSWER. December.

EPA. 1990a. "National Functional Guidelines for Organic Data Review." Contract Laboratory Program (CLP). December (Draft). Revision June 1991.

EPA. 1990b. "Statement of Work for Organic Analysis." CLP Document Number OLM01.8. Revisions (five) through August 1991.

EPA. 1990c. "Statement of Work for Inorganic Analysis." CLP Document Number ILM02.0. Revision September 1991.

REFERENCES (continued)

EPA. 1992. "Test Methods for Evaluating Solid Waste, Third Edition SW-846." OSWER.

EPA. 1993. "Data Quality Objectives Process for Superfund." Interim Final Guidance. Document Number EPA/540/G-93/071. September.

EPA. 1994. "National Functional Guidelines for Inorganic Data Review." CLP Document Number EPA-540/R-94-013. February.

APPENDIX L

DATA VALIDATION ISSUES

APPENDIX L
DATA USABILITY ISSUES

Data usability issues that affect the detection of chemicals at the Tidal Area Sites are discussed in the following sections, by analytical methodology. The discussion focuses on data evaluation issues relevant to the identification of chemicals of potential concern (COPC) for the human health risk assessment (HHRA) and the qualitative ecological risk assessment (QEA).

CONTRACT LABORATORY PROGRAM SEMIVOLATILE ORGANIC COMPOUNDS

Most semivolatile organic compound (SVOC) data were valid except for hexachlorocyclopentadiene in four water samples. The four samples, out of a total of 131 samples, was rejected (R) due to calibration criteria exceedances. This rejection effectively excluded only a small portion of the data set and resulted in the rejection of only 3.05 percent of hexachlorocyclopentadiene results. One sample, out of a total of 131 samples, was rejected (R) due to internal standard criteria failure for the following compounds: benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, di-n-octylphthalate, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. This effectively excluded only a small portion of the data set and resulted in the rejection of less than 1 percent of the results for these compounds.

Common SVOC laboratory contaminants were found in water, sediment, and soil laboratory blanks. Bis(2-ethylhexyl)phthalate was detected in the laboratory blanks for water, sediment, and soil. Diethylphthalate, dimethylphthalate, butylbenzylphthalate, and di-n-butylphthalate were found in laboratory blanks for soil and sediment. Sample results for these compounds were qualified as nondetected (UJb) if the sample result was less than 10 times the blank value. Additionally, pyrene was found in the laboratory blank associated with the sediment samples. Pyrene was qualified as nondetected (UJb) if the associated sample result was less than 5 times the blank value. These qualifications affected no more than 7 samples out of the total of 131 samples (5.3 percent).

Quantitation limits defined in the quality assurance project plan (QAPP) for SVOCs were generally met for water and tissue samples; however, limits were exceeded in most soil and sediment samples. The increased quantitation limits were primarily the result of the high moisture content of the soil and sediment samples. Average soil sample quantitation limits were within 10 percent of the quantitation limit goals stated in the QAPP. Sediment sample quantitation limits were elevated considerably due to the high moisture content associated with this matrix. Soil quantitation limits generally exceeded those

listed under the California Regional Water Quality Control Board (RWQCB) "Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments" dated May 1998, because of the high moisture content coupled with analytical method constraints. For the other soil SVOCs, the minor differences in quantitation limits should not limit the usability of the data.

CONTRACT LABORATORY PROGRAM METALS

All metal results were valid except for antimony which was rejected (Re) in 7 soil and 8 sediment samples out of a total of 131 samples (11 percent) due to low matrix spike recoveries. Soil, sediment, and water laboratory blanks contained detectable amounts of several metals (antimony, chromium, and mercury) which affected from 8 to 14 percent of the data. Laboratory blanks for tissue samples contained detectable amounts of sodium, cadmium, and chromium which affected less than 5 percent of the tissue data. Many other metals were occasionally found in laboratory and field blanks but affected less than 5 percent of the data. Sample results were qualified as nondetected (UJb) if the sample results were less than 5 times the associated blank value.

Quantitation limits defined in the QAPP for metals were generally met.

CONTRACT LABORATORY PROGRAM PESTICIDES AND POLYCHLORINATED BIPHENYLS

All pesticide and polychlorinated biphenyl (PCB) results were valid, with the exception of delta-BHC, in 12 of 18 low level pesticide and PCB tissue samples. Delta-BHC was rejected (Re) due to low recovery in the matrix spike. In the low-level pesticide and PCB analysis, 4,4'-DDT, alpha BHC, and hexachlorobenzene were detected in associated blanks and qualified as nondetected (UJb) if the sample result was less than 5 times the blank value. This qualification affected no more than 2 samples out of the total of 11 tissue samples.

Quantitation limits defined in the QAPP for pesticides and PCBs were generally met for water, tissue, soil, and sediment. However, soil quantitation limits generally exceeded those listed in the RWQCB "Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments" dated May 1998, because of the high moisture content coupled with analytical method constraints. For the other soil pesticides and PCBs, the minor differences in quantitation limits should not limit the usability of the data.

DIOXINS BY U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD 8280

All dioxin results were found to be valid and usable with no rejected data. Laboratory and field blanks were free from contamination. In addition, the quantitation limits specified in the QAPP were met. However, due to the fact that dioxin quantitation limits achieved by U.S. Environmental Protection Agency (EPA) Method 8280 are too high, a majority of the quantitation limits for dioxin exceed what is necessary for ecological risk assessment.

TOTAL ORGANIC CARBON BY METHOD 5310B OF STANDARD METHODS FOR THE EXAMINATION OF WASTE AND WASTEWATER

All total organic carbon results were found to be valid and usable with no rejected data. Laboratory and field blanks were free from contamination. In addition, the detection limits specified in the QAPP were met.

DATA VALIDATION CONCLUSION

Review of the data indicates that the RI data are over 99 percent complete and are of high usability. Certain volatile organic compounds, SVOCs, metals, and pesticides have been qualified as nondetected (UJb) as a result of blank contamination, but are not expected to impact the selection of COPCs. In general, elevated quantitation limits, except for the those SVOCs and pesticides and PCBs that exceed the RWQCB goals and the dioxin that exceeded ecological risk assessment goals, do not appear to have impacted the usability of the data.

Although some qualifiers were added, a final review of the data set with respect to EPA data quality parameters indicates that the data are of high overall quality. The data meet all of the requirements of Level IV data and all requirements of "definitive data," as described in the "Data Quality Objectives Process for Superfund" (EPA 1993). Because the data meet all applicable requirements, they can be used for site characterization, risk assessment, and feasibility studies. The overall assessment of the sampling program, quality assurance and quality control data, data review, and data validation results, is that the data are generally of acceptable precision, accuracy, representativeness, completeness, and comparability. All supporting documentation and data are available upon request, including cursory and full validation reports and the database that contains the sample results and summaries of qualified data.

EPA guidance was used to determine the usability of the validated data. This guidance is provided in "Risk Assessment Guidance for Superfund" (RAGS), Volume I (EPA 1989). Exhibit 5-5 in RAGS states that data qualified as estimated (J) based on data validation reports may be used in quantitative risk assessments. Only data qualified as rejected (R) are considered unusable for risk assessment purposes. Greater than 99 percent of the data collected are; therefore, usable for their intended purpose. If data are of acceptable quality for use in quantitative risk assessments, they should also be appropriate for determining the extent of contamination. Accordingly, all J-qualified data and no R-qualified data were used for the RI.

APPENDIX M

HUMAN HEALTH STATISTICAL SUMMARY TABLES

TABLES M-1 TO M-11

STATISTICAL DATA SUMMARIES AND METHODS FOR CALCULATING THE 95TH PERCENTILE UPPER CONFIDENCE LIMIT

TABLE M-1

SITE 1 - TIDAL AREA LANDFILL
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 0.5 FOOT BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	8/8	Normal	NL	NL	5,470	23,700	17,200	21,700	17,200	21,700
Antimony	2/6	Not Tested	1.6	3.5	2.5	3.1	1.7	2.5	1.7	2.5
Arsenic	8/8	Lognormal	NL	NL	7.7	57.6	18.1	33.8	18.1	33.8
Barium	8/8	Lognormal	NL	NL	99.0	436	198	328	198	328
Beryllium	2/8	Not Tested	0.03	0.06	0.16	0.51	0.10	0.22	0.10	0.22
Cadmium	2/8	Not Tested	0.06	0.11	3.2	5.8	1.2	2.6	1.2	2.6
Calcium	8/8	Lognormal	NL	NL	2,840	13,100	5,440	8,180	5,440	8,180
Chromium	8/8	Normal	NL	NL	24.3	82.7	53.0	67.0	53.0	67.0
Cobalt	8/8	Normal	NL	NL	5.5	19.0	13.1	16.3	13.1	16.3
Copper	8/8	Lognormal	NL	NL	31.8	264	89.6	193	89.6	193
Iron	8/8	Normal	NL	NL	11,900	50,000	32,300	40,200	32,300	40,200
Lead	8/8	Normal	NL	NL	19.7	156	71.1	108	71.1	108
Magnesium	8/8	Normal	NL	NL	3,920	13,900	10,400	13,000	10,400	13,000
Manganese	8/8	Normal	NL	NL	109	692	349	473	349	473
Mercury	4/8	Lognormal	0.14	0.19	0.090	0.48	0.18	0.40	0.18	0.40
Molybdenum	3/8	Not Tested	0.26	3.7	1.5	3.7	1.6	2.5	1.6	2.5
Nickel	8/8	Normal	NL	NL	24.8	131	65.5	88.9	65.5	88.9
Potassium	8/8	Normal	NL	NL	1,790	6,710	4,340	5,520	4,340	5,520
Silver	1/8	Not Tested	0.18	0.93	1.2	1.2	0.29	0.55	0.29	0.55
Sodium	8/8	Lognormal	NL	NL	4,520	46,700	16,700	49,300	16,700	46,700
Vanadium	8/8	Normal	NL	NL	43.6	108	70.5	85.2	70.5	85.2
Zinc	8/8	Lognormal	NL	NL	70.6	743	258	547	258	547

TABLE M-1 (Continued)

SITE 1 - TIDAL AREA LANDFILL
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FOOT BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Semivolatile Organic Compound										
2,6-Dimethylnaphthalene	1/7	Not Tested	0.13	1.1	0.03	0.03	0.2	0.3	0.03	0.03
Benzo(a)anthracene	3/7	Not Tested	0.13	1.1	0.04	0.07	0.1	0.3	0.07	0.07
Benzo(a)pyrene	1/7	Not Tested	0.13	1.1	0.07	0.07	0.2	0.3	0.07	0.07
Benzo(b)fluoranthene	3/7	Not Tested	0.13	1.1	0.05	0.09	0.1	0.3	0.09	0.09
Benzo(e)pyrene	3/7	Not Tested	0.13	1.1	0.05	0.05	0.1	0.3	0.05	0.05
Benzo(g,h,i)perylene	1/7	Not Tested	0.13	1.1	0.07	0.07	0.2	0.3	0.07	0.07
Benzo(k)fluoranthene	3/7	Not Tested	0.13	1.1	0.04	0.08	0.1	0.3	0.08	0.08
Benzoic acid	5/7	Lognormal	0.5	2.7	0.01	0.1	0.3	6	0.1	0.1
Butylbenzylphthalate	1/7	Not Tested	0.13	1.1	0.05	0.05	0.2	0.3	0.05	0.05
Chrysene	3/7	Not Tested	0.13	1.1	0.06	0.1	0.1	0.3	0.1	0.1
Fluoranthene	4/7	Normal	0.13	0.2	0.1	0.2	0.1	0.1	0.1	0.1
Indeno(1,2,3-cd)pyrene	1/7	Not Tested	0.13	1.1	0.05	0.05	0.2	0.3	0.05	0.05
Perylene	1/7	Not Tested	0.13	1.1	0.04	0.04	0.2	0.3	0.04	0.04
Phenanthrene	3/7	Not Tested	0.13	1.1	0.03	0.04	0.1	0.3	0.04	0.04
Pyrene	3/7	Not Tested	0.13	1.1	0.08	0.3	0.2	0.3	0.2	0.3
Pesticide/Polychlorinated Biphenyl										
2,4'-DDD	5/7	Lognormal	0.0002	0.00025	0.0007	0.01	0.006	0.6	0.006	0.01
2,4'-DDE	2/7	Not Tested	0.0002	0.00069	0.0006	0.0009	0.0003	0.0006	0.0003	0.0006
2,4'-DDT	1/7	Not Tested	0.0002	0.00043	0.001	0.001	0.0003	0.0005	0.0003	0.0005
4,4'-DDD	5/7	Lognormal	0.0002	0.00025	0.002	0.03	0.02	9	0.02	0.03

TABLE M-1 (Continued)

SITE 1 - TIDAL AREA LANDFILL
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FOOT BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
4,4'-DDE	5/7	Normal	0.0002	0.00025	0.002	0.006	0.003	0.004	0.003	0.004
4,4'-DDT	4/7	Normal	0.0002	0.00034	0.0007	0.002	0.0008	0.001	0.0008	0.001
Aldrin	2/7	Not Tested	0.0002	0.00034	0.001	0.002	0.0005	0.001	0.0005	0.001
Alpha-chlordane	5/7	Normal	0.0002	0.00025	0.002	0.005	0.002	0.004	0.002	0.004
Dieldrin	3/7	Not Tested	0.0002	0.00034	0.0005	0.002	0.0007	0.001	0.0007	0.001
Heptachlor	1/7	Not Tested	0.0002	0.00069	0.0006	0.0006	0.0002	0.0004	0.0002	0.0004
Hexachlorobenzene	2/7	Not Tested	0.0002	0.00034	0.0009	0.002	0.0005	0.001	0.0005	0.001
Mirex	2/7	Not Tested	0.0002	0.00034	0.0005	0.0005	0.0002	0.0004	0.0002	0.0004
PCB-101 (2,2',3,5,5')	5/7	Normal	0.0002	0.00025	0.0003	0.002	0.0008	0.001	0.0008	0.001
PCB-105 (2,3,3',4,4')	5/7	Normal	0.0002	0.00025	0.0004	0.002	0.0006	0.001	0.0006	0.001
PCB-118 (2,3',4,4',5)	5/7	Lognormal	0.0002	0.00025	0.0004	0.004	0.002	0.02	0.002	0.004
PCB-128 (2,2',3,3',4,4')	2/7	Not Tested	0.0002	0.00034	0.0008	0.0008	0.0003	0.0006	0.0003	0.0006
PCB-138 (2,2',3,4,4',5')	5/7	Normal	0.0002	0.00025	0.0007	0.003	0.001	0.002	0.001	0.002
PCB-153 (2,2',4,4',5,5')	5/7	Normal	0.0002	0.00025	0.0006	0.002	0.001	0.002	0.001	0.002
PCB-170 (2,2',3,3',4,4',5)	1/7	Not Tested	0.0002	0.00069	0.0005	0.0005	0.0002	0.0003	0.0002	0.0003
PCB-18 (2,2',5)	3/7	Not Tested	0.0002	0.00069	0.0003	0.002	0.0006	0.001	0.0006	0.001
PCB-180 (2,2',3,4,4',5,5')	5/7	Normal	0.0002	0.00025	0.0006	0.002	0.0007	0.001	0.0007	0.001
PCB-187 (2,2',3,4',5,5',6)	5/7	Normal	0.0002	0.00025	0.0002	0.0007	0.0004	0.0005	0.0004	0.0005
PCB-195 (2,2',3,3',4,4',5,6)	1/7	Not Tested	0.0002	0.00069	0.0007	0.0007	0.0002	0.0004	0.0002	0.0004
PCB-206 (2,2',3,3',4.4',5,5',6)	3/7	Not Tested	0.0002	0.00069	0.0003	0.0005	0.0003	0.0004	0.0003	0.0004
PCB-28 (2,4,4')	1/7	Not Tested	0.0002	0.00069	0.002	0.002	0.0005	0.001	0.0005	0.001
PCB-44 (2,2',3,5')	1/7	Not Tested	0.0002	0.00069	0.003	0.003	0.0006	0.001	0.0006	0.001

TABLE M-1 (Continued)

SITE 1 - TIDAL AREA LANDFILL
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FOOT BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
PCB-52 (2,2',5,5')	4/7	Lognormal	0.0002	0.00025	0.0002	0.002	0.0006	0.004	0.0006	0.002
PCB-66 (2,3',4,4')	2/7	Not Tested	0.0002	0.00034	0.003	0.004	0.001	0.002	0.001	0.002
PCB-77 (3,3',4,4')	3/7	Not Tested	0.0002	0.00034	0.0002	0.001	0.0004	0.0008	0.0004	0.0008
Trans-nonachlor	5/7	Normal	0.0002	0.00025	0.0008	0.004	0.002	0.003	0.002	0.003

TABLE M-2

SITE 1 - TIDAL AREA LANDFILL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	24/24	Normal	NL	NL	4,370	29,400	18,600	21,100	18,600	21,100
Antimony	5/17	Lognormal	1.4	3.7	1.2	3.1	1.4	1.7	1.4	1.7
Arsenic	24/24	Lognormal	NL	NL	2.9	57.6	14.4	19.2	14.4	19.2
Barium	24/24	Lognormal	NL	NL	26.0	436	102	137	102	137
Beryllium	3/24	Not Tested	0.03	0.12	0.16	0.56	0.079	0.13	0.079	0.13
Cadmium	5/24	Lognormal	0.06	0.23	0.74	5.8	0.47	1.6	0.47	1.6
Calcium	24/24	Lognormal	NL	NL	2,840	13,100	6,310	7,330	6,310	7,330
Chromium	23/24	Normal	14	14	1.8	92.5	53.8	62.8	53.8	62.8
Cobalt	24/24	Normal	NL	NL	5.2	33.5	15.6	18.5	15.6	18.5
Copper	24/24	Lognormal	NL	NL	17.8	264	47.0	61.5	47.0	61.5
Iron	24/24	Normal	NL	NL	8,110	50,000	26,200	30,200	26,200	30,200
Lead	22/24	Lognormal	3.6	6.7	5.3	156	30.6	56.7	30.6	56.7
Magnesium	24/24	Lognormal	NL	NL	3,920	18,700	13,000	14,900	13,000	14,900
Manganese	24/24	Lognormal	NL	NL	75.1	1,000	352	462	352	462
Mercury	6/24	Lognormal	0.08	0.29	0.090	0.48	0.12	0.15	0.12	0.15
Molybdenum	7/24	Lognormal	0.26	8.5	1.5	4.2	2.7	5.6	2.7	4.2
Nickel	24/24	Normal	NL	NL	24.7	131	74.0	83.4	74.0	83.4
Potassium	24/24	Normal	NL	NL	1,790	7,320	4,770	5,290	4,770	5,290
Silver	1/24	Not Tested	0.18	0.93	1.2	1.2	0.24	0.32	0.24	0.32
Sodium	24/24	Lognormal	NL	NL	4,520	64,600	28,600	43,600	28,600	43,600
Thallium	3/24	Not Tested	0.59	2.3	1.2	2.2	0.74	0.91	0.74	0.91
Vanadium	24/24	Normal	NL	NL	29.6	108	69.9	76.4	69.9	76.4

TABLE M-2 (Continued)

SITE 1 - TIDAL AREA LANDFILL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Zinc	23/24	Lognormal	52	52	46.4	743	140	192	140	192
Volatile Organic Compound										
2-Butanone	1/16	Not Tested	0.017	0.25	0.4	0.4	0.06	0.1	0.06	0.1
Acetone	2/16	Not Tested	0.098	1.8	0.2	0.6	0.2	0.3	0.2	0.3
Carbon Disulfide	7/16	Lognormal	0.017	0.069	0.01	0.1	0.04	0.06	0.04	0.06
Chloromethane	3/16	Not Tested	0.017	0.069	0.03	0.05	0.02	0.03	0.02	0.03
Semivolatile Organic Compound										
2,6-Dimethylnaphthalene	1/8	Not Tested	0.13	1.3	0.03	0.03	0.2	0.4	0.03	0.03
Benzo(a)anthracene	3/23	Not Tested	0.13	2	0.04	0.07	0.4	0.5	0.07	0.07
Benzo(a)pyrene	1/23	Not Tested	0.13	2	0.07	0.07	0.4	0.5	0.07	0.07
Benzo(b)fluoranthene	3/23	Not Tested	0.13	2	0.05	0.09	0.4	0.5	0.09	0.09
Benzo(e)pyrene	3/8	Not Tested	0.13	1.3	0.05	0.05	0.2	0.4	0.05	0.05
Benzo(g,h,i)perylene	1/23	Not Tested	0.13	2	0.07	0.07	0.4	0.5	0.07	0.07
Benzo(k)fluoranthene	3/23	Not Tested	0.13	2	0.04	0.08	0.4	0.5	0.08	0.08
Benzoic acid	6/8	Lognormal	0.5	2.7	0.01	1	0.5	11	0.5	1
Butylbenzylphthalate	1/23	Not Tested	0.13	2	0.05	0.05	0.4	0.5	0.05	0.05
Chrysene	3/23	Not Tested	0.13	2	0.06	0.1	0.4	0.5	0.1	0.1
Fluoranthene	4/23	Normal	0.13	2	0.1	0.2	0.4	0.5	0.2	0.2
Indeno(1,2,3-cd)pyrene	1/23	Not Tested	0.13	2	0.05	0.05	0.4	0.5	0.05	0.05
Perylene	1/8	Not Tested	0.13	1.3	0.04	0.04	0.2	0.4	0.04	0.04
Phenanthrene	3/23	Not Tested	0.13	2	0.03	0.04	0.4	0.5	0.04	0.04

TABLE M-2 (Continued)

SITE 1 - TIDAL AREA LANDFILL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Phenol	8/23	Lognormal	0.13	1.7	0.5	11	2	4	2	4
Pyrene	4/23	Normal	0.13	2	0.08	1	0.5	0.6	0.5	0.6
Pesticide/Polychlorinated Biphenyl										
2,4'-DDD	5/8	Lognormal	0.0002	0.00029	0.0007	0.01	0.005	0.3	0.005	0.01
2,4'-DDE	2/8	Not Tested	0.0002	0.00069	0.0006	0.0009	0.0003	0.0005	0.0003	0.0005
2,4'-DDT	1/8	Not Tested	0.0002	0.00043	0.001	0.001	0.0002	0.0004	0.0003	0.0005
4,4'-DDD	5/23	Lognormal	0.0002	0.02	0.002	0.03	0.009	0.02	0.009	0.02
4,4'-DDE	5/23	Normal	0.0002	0.02	0.002	0.006	0.004	0.005	0.004	0.005
4,4'-DDT	4/23	Normal	0.0002	0.02	0.0007	0.002	0.004	0.005	0.002	0.002
Aldrin	2/23	Not Tested	0.0002	0.0098	0.001	0.002	0.002	0.002	0.002	0.002
Alpha-chlordane	5/23	Normal	0.0002	0.0098	0.002	0.005	0.003	0.003	0.003	0.003
Dieldrin	3/23	Not Tested	0.0002	0.02	0.0005	0.002	0.004	0.005	0.002	0.002
Heptachlor	2/23	Not Tested	0.0002	0.0098	0.0006	0.0008	0.002	0.002	0.0008	0.0008
Hexachlorobenzene	2/8	Not Tested	0.0002	0.00034	0.0009	0.002	0.0005	0.0009	0.0005	0.0009
Mirex	2/8	Not Tested	0.0002	0.00034	0.0005	0.0005	0.0002	0.0003	0.0002	0.0004
PCB-101 (2,2',3,5,5')	5/8	Normal	0.0002	0.00029	0.0003	0.002	0.0007	0.001	0.0007	0.001
PCB-105 (2,3,3',4,4')	5/8	Lognormal	0.0002	0.00029	0.0004	0.002	0.0006	0.002	0.0006	0.002
PCB-118 (2,3',4,4',5)	5/8	Lognormal	0.0002	0.00029	0.0004	0.004	0.001	0.01	0.001	0.004
PCB-128 (2,2',3,3',4,4')	2/8	Not Tested	0.0002	0.00034	0.0008	0.0008	0.0003	0.0005	0.0003	0.0005
PCB-138 (2,2',3,4,4',5')	5/8	Normal	0.0002	0.00029	0.0007	0.003	0.001	0.002	0.001	0.002
PCB-153 (2,2',4,4',5,5')	5/8	Normal	0.0002	0.00029	0.0006	0.002	0.0009	0.001	0.0009	0.001
PCB-170 (2,2',3,3',4,4',5)	1/8	Not Tested	0.0002	0.00069	0.0005	0.0005	0.0002	0.0003	0.0002	0.0003

TABLE M-2 (Continued)

SITE 1 - TIDAL AREA LANDFILL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
PCB-18 (2,2',5)	4/8	Lognormal	0.0002	0.00069	0.0002	0.002	0.0005	0.002	0.0005	0.002
PCB-180 (2,2',3,4,4',5,5')	5/8	Normal	0.0002	0.00029	0.0006	0.002	0.0007	0.001	0.0007	0.001
PCB-187 (2,2',3,4',5,5',6)	5/8	Normal	0.0002	0.00029	0.0002	0.0007	0.0003	0.0005	0.0003	0.0005
PCB-195 (2,2',3,3',4,4',5,6)	1/8	Not Tested	0.0002	0.00069	0.0007	0.0007	0.0002	0.0004	0.0002	0.0004
PCB-206 (2,2',3,3',4,4',5,5',6)	3/8	Not Tested	0.0002	0.00069	0.0003	0.0005	0.0003	0.0004	0.0003	0.0004
PCB-28 (2,4,4')	1/8	Not Tested	0.0002	0.00069	0.002	0.002	0.0004	0.0009	0.0004	0.0009
PCB-44 (2,2',3,5')	2/8	Not Tested	0.0002	0.00069	0.0003	0.003	0.0005	0.001	0.0005	0.001
PCB-52 (2,2',5,5')	4/8	Lognormal	0.0002	0.00029	0.0002	0.002	0.0005	0.002	0.0005	0.002
PCB-66 (2,3',4,4')	2/8	Not Tested	0.0002	0.00034	0.003	0.004	0.0009	0.002	0.0009	0.002
PCB-77 (3,3',4,4')	3/8	Not Tested	0.0002	0.00034	0.0002	0.001	0.0004	0.0007	0.0004	0.0007
Trans-nonachlor	5/8	Lognormal	0.0002	0.00029	0.0008	0.004	0.003	0.06	0.003	0.004

TABLE M-3

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	111/111	Normal	NL	NL	4,420	33,700	18,300	19,300	18,300	19,300
Antimony	74/110	Lognormal	0.43	2.7	0.53	7.1	1.2	1.4	1.2	1.4
Arsenic	110/111	Lognormal	5.2	5.2	3.8	47.2	12.4	13.6	12.4	13.6
Barium	111/111	Lognormal	NL	NL	42.5	7,710	150	169	150	169
Beryllium	15/111	Lognormal	0.02	3	0.11	0.57	0.074	0.097	0.074	0.097
Cadmium	4/111	Lognormal	0.04	6	0.43	0.83	0.048	0.056	0.048	0.056
Calcium	111/111	Lognormal	NL	NL	1,870	45,900	7,300	8,280	7,300	8,280
Chromium	105/111	Lognormal	20	39	18.1	319	56.6	61.9	56.6	61.9
Cobalt	111/111	Lognormal	NL	NL	7.2	31.5	16.1	16.9	16.1	16.9
Copper	111/111	Lognormal	NL	NL	17.3	272	45.6	49.2	45.6	49.2
Iron	111/111	Lognormal	NL	NL	12,800	135,000	31,800	33,700	31,800	33,700
Lead	111/111	Lognormal	NL	NL	7.5	300	64.9	77.7	64.9	77.7
Magnesium	111/111	Lognormal	NL	NL	4,670	27,400	11,000	11,500	11,000	11,500
Manganese	111/111	Lognormal	NL	NL	59 0	2,090	515	564	515	564
Mercury	85/111	Lognormal	0.05	0.44	0.050	0.92	0.20	0.24	0.20	0.24
Molybdenum	23/111	Lognormal	0.18	3.1	0.32	53.7	0.70	0.94	0.70	0.94
Nickel	111/111	Lognormal	NL	NL	29.0	146	72.1	75.7	72.1	75.7
Potassium	111/111	Normal	NL	NL	1,720	10,600	4,410	4,680	4,410	4,680
Selenium	2/111	Not Tested	0.69	3.2	1.0	1.3	0.54	0.58	0.54	0.58
Silver	9/111	Lognormal	0.12	0.57	0.21	0.72	0.12	0.13	0.12	0.13
Sodium	99/111	Lognormal	27	910	48.2	117,000	18,900	32,600	18,900	32,600
Thallium	8/111	Lognormal	0.4	1.9	0.66	2.4	0.37	0.40	0.37	0.40
Vanadium	111/111	Normal	NL	NL	32.3	130	67.6	70.4	67.6	70.4

TABLE M-3 (Continued)

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Zinc	111/111	Lognormal	NL	NL	46.9	959	149	164	149	164
Semivolatile Organic Compound										
1-Methylphenanthrene	1/65	Not Tested	0.034	0.79	0.04	0.04	0.09	0.1	0.04	0.04
2,4-Dimethylphenol	1/65	Not Tested	0.034	0.79	0.02	0.02	0.09	0.1	0.02	0.02
2,6-Dimethylnaphthalene	4/65	Lognormal	0.034	0.79	0.05	0.1	0.08	0.1	0.08	0.1
2-Methylnaphthalene	1/65	Not Tested	0.034	0.79	0.04	0.04	0.09	0.1	0.04	0.04
4-Methylphenol	5/65	Lognormal	0.034	0.79	0.03	0.7	0.09	0.1	0.09	0.1
Acenaphthene	3/65	Not Tested	0.034	0.79	0.02	0.03	0.09	0.1	0.03	0.03
Anthracene	4/65	Lognormal	0.034	0.79	0.03	0.1	0.09	0.1	0.09	0.1
Benzo(a)anthracene	13/65	Lognormal	0.034	0.79	0.01	0.4	0.08	0.1	0.08	0.1
Benzo(a)pyrene	14/65	Lognormal	0.034	0.79	0.01	0.3	0.08	0.1	0.08	0.1
Benzo(b)fluoranthene	15/65	Lognormal	0.034	0.79	0.006	0.4	0.09	0.1	0.09	0.1
Benzo(e)pyrene	12/65	Lognormal	0.034	0.79	0.01	0.2	0.08	0.1	0.08	0.1
Benzo(g,h,i)perylene	11/65	Lognormal	0.034	0.79	0.02	0.2	0.08	0.1	0.08	0.1
Benzo(k)fluoranthene	12/65	Lognormal	0.034	0.79	0.01	0.3	0.08	0.1	0.08	0.1
Benzoic acid	20/65	Lognormal	0.086	2	0.02	0.9	0.2	0.3	0.2	0.3
Bis(2-ethlhexyl)phthalate	2/65	Not Tested	0.035	0.79	0.09	0.2	0.1	0.1	0.1	0.1
Carbazole	2/65	Not Tested	0.034	0.79	0.02	0.04	0.09	0.1	0.04	0.04
Chrysene	17/65	Lognormal	0.034	0.79	0.006	0.4	0.09	0.1	0.09	0.1
Dibenz(a,h)anthracene	5/65	Lognormal	0.034	0.79	0.01	0.09	0.09	0.1	0.09	0.09
Dibenzothiophene	1/65	Not Tested	0.034	0.79	0.02	0.02	0.09	0.1	0.02	0.02
Diethylphthalate	1/65	Not Tested	0.034	0.79	0.2	0.2	0.09	0.1	0.09	0.1

TABLE M-3 (Continued)

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Fluoranthene	19/65	Lognormal	0.034	0.79	0.01	1	0.1	0.1	0.1	0.1
Fluorene	1/65	Not Tested	0.034	0.79	0.03	0.03	0.09	0.1	0.03	0.03
Indeno(1,2,3-cd)pyrene	11/65	Lognormal	0.034	0.79	0.01	0.2	0.08	0.1	0.08	0.1
Isophorone	1/65	Not Tested	0.034	0.79	0.04	0.04	0.09	0.1	0.04	0.04
Naphthalene	3/65	Not Tested	0.034	0.79	0.02	0.2	0.09	0.1	0.09	0.1
Perylene	7/65	Lognormal	0.034	0.79	0.009	0.1	0.08	0.1	0.08	0.1
Phenanthrene	11/65	Lognormal	0.034	0.79	0.007	0.7	0.09	0.1	0.09	0.1
Pyrene	19/65	Lognormal	0.034	0.79	0.006	0.7	0.09	0.1	0.09	0.1
Pesticide/Polychlorinated Biphenyl										
2,4'-DDD	31/65	Lognormal	0.0001	0.00048	0.0003	0.007	0.0008	0.001	0.0008	0.001
2,4'-DDE	14/65	Lognormal	0.0001	0.00048	0.0003	0.001	0.0002	0.0002	0.0002	0.0002
2,4'-DDT	32/65	Lognormal	0.0001	0.00048	0.0002	0.005	0.0005	0.0007	0.0005	0.0007
4,4'-DDD	40/65	Lognormal	0.0001	0.0012	0.0003	0.03	0.002	0.004	0.002	0.004
4,4'-DDE	55/65	Lognormal	0.0001	0.00026	0.0002	0.009	0.002	0.002	0.002	0.002
4,4'-DDT	42/65	Lognormal	0.0001	0.0011	0.0002	0.03	0.002	0.004	0.002	0.004
Aldrin	11/65	Lognormal	0.0001	0.00057	0.0002	0.0008	0.0001	0.0002	0.0002	0.0002
Alpha-chlordane	31/65	Lognormal	0.0001	0.00048	0.0002	0.003	0.0005	0.0007	0.0005	0.0007
Dieldrin	19/65	Lognormal	0.0001	0.00048	0.0002	0.002	0.0002	0.0003	0.0002	0.0003
Gamma-BHC (Lindane)	7/65	Lognormal	0.0001	0.00057	0.0003	0.0009	0.0001	0.0002	0.0001	0.0002
Heptachlor	2/65	Not Tested	0.0001	0.00057	0.0003	0.0004	0.0001	0.0001	0.0001	0.0001
Heptachlor epoxide	8/65	Lognormal	0.0001	0.00057	0.0002	0.001	0.0001	0.0002	0.0001	0.0002
Hexachlorobenzene	19/65	Lognormal	0.0001	0.00048	0.0002	0.002	0.0002	0.0002	0.0002	0.0002

TABLE M-3 (Continued)

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Mirex	16/65	Lognormal	0.0001	0.00048	0.00005	0.001	0.0001	0.0002	0.0002	0.0002
PCB-101 (2,2',3,5,5')	26/65	Lognormal	0.0001	0.00048	0.00007	0.001	0.0002	0.0003	0.0002	0.0003
PCB-105 (2,3,3',4,4')	19/65	Lognormal	0.0001	0.00048	0.0001	0.001	0.0002	0.0002	0.0002	0.0002
PCB-118 (2,3',4,4',5)	25/65	Lognormal	0.0001	0.00048	0.00009	0.001	0.0003	0.0004	0.0003	0.0004
PCB-126 (3,3',4,4',5)	13/65	Lognormal	0.0001	0.00057	0.0002	0.004	0.0002	0.0003	0.0002	0.0003
PCB-128 (2,2',3,3',4,4')	7/65	Lognormal	0.0001	0.00057	0.0002	0.0006	0.0001	0.0001	0.0001	0.0001
PCB-138 (2,2',3,4,4',5')	31/65	Lognormal	0.0001	0.00048	0.0002	0.002	0.0004	0.0005	0.0004	0.0005
PCB-153 (2,2',4,4',5,5')	28/65	Lognormal	0.0001	0.00048	0.00007	0.002	0.0003	0.0004	0.0003	0.0004
PCB-170 (2,2',3,3',4,4',5)	6/65	Lognormal	0.0001	0.00057	0.0003	0.0009	0.0001	0.0001	0.0001	0.0001
PCB-18 (2,2',5)	12/65	Lognormal	0.0001	0.00057	0.0001	0.0004	0.0001	0.0001	0.0001	0.0001
PCB-180 (2,2',3,4,4',5,5')	19/65	Lognormal	0.0001	0.00048	0.0001	0.002	0.0002	0.0003	0.0002	0.0003
PCB-187 (2,2',3,4',5,5',6)	15/65	Lognormal	0.0001	0.00079	0.00007	0.0008	0.0002	0.0002	0.0002	0.0002
PCB-195 (2,2',3,3',4,4',5,6)	3/65	Not Tested	0.0001	0.00057	0.0001	0.0004	0.0001	0.0001	0.0001	0.0001
PCB-206 (2,2',3,3',4,4',5,5',6)	19/65	Lognormal	0.0001	0.00057	0.00005	0.001	0.0002	0.0002	0.0002	0.0002
PCB-209 (2,2',3,3',4,4',5,5',6,6')	2/65	Not Tested	0.0001	0.00057	0.0002	0.0004	0.0001	0.0001	0.0001	0.0001
PCB-28 (2,4,4')	2/65	Not Tested	0.0001	0.00057	0.0004	0.0005	0.0001	0.0001	0.0001	0.0001
PCB-44 (2,2',3,5')	3/65	Not Tested	0.0001	0.00057	0.0002	0.0003	0.0001	0.0001	0.0001	0.0001
PCB-52 (2,2',5,5')	20/65	Lognormal	0.0001	0.00057	0.00006	0.001	0.0002	0.0002	0.0002	0.0002
PCB-66 (2,3',4,4')	14/65	Lognormal	0.0001	0.00048	0.00009	0.001	0.0002	0.0002	0.0002	0.0002
PCB-77 (3,3',4,4')	15/65	Lognormal	0.0001	0.00057	0.00009	0.001	0.0002	0.0003	0.0002	0.0003
PCB-8 (2,4')	20/65	Lognormal	0.0001	0.00093	0.0003	0.004	0.0003	0.0005	0.0004	0.0005
Trans-nonachlor	29/65	Lognormal	0.00011	0.00048	0.0002	0.002	0.0005	0.0007	0.0005	0.0007

TABLE M-4

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	131/131	Normal	NL	NL	4,420	33,700	18,200	19,100	18,200	19,100
Antimony	76/129	Lognormal	0.43	2.7	0.53	7.1	1.1	1.3	1.1	1.3
Arsenic	126/131	Lognormal	2.5	6.5	2.3	47.2	12.5	13.9	12.5	13.9
Barium	131/131	Lognormal	NL	NL	25.7	7,710	143	160	143	160
Beryllium	16/131	Lognormal	0.02	3	0.11	0.57	0.068	0.085	0.068	0.085
Cadmium	5/131	Lognormal	0.04	6	0.40	0.83	0.049	0.057	0.049	0.057
Calcium	131/131	Lognormal	NL	NL	1,870	45,900	7,600	8,560	7,600	8,560
Chromium	124/131	Lognormal	20	39	18.1	319	56.6	61.4	56.6	61.4
Cobalt	131/131	Lognormal	NL	NL	3.7	108	16.1	17.1	16.1	17.1
Copper	131/131	Lognormal	NL	NL	13.0	272	44.2	47.4	44.2	47.4
Iron	131/131	Lognormal	NL	NL	12,300	135,000	30,900	32,700	30,900	32,700
Lead	130/131	Lognormal	5.8	5.8	4.7	1,160	63.6	77.7	63.6	77.7
Magnesium	131/131	Lognormal	NL	NL	4,670	27,400	11,100	11,500	11,100	11,500
Manganese	131/131	Lognormal	NL	NL	59.0	6,300	520	573	520	573
Mercury	91/131	Lognormal	0.05	0.44	0.050	0.92	0.18	0.22	0.18	0.22
Molybdenum	35/131	Lognormal	0.18	3.1	0.32	53.7	1.0	1.4	1.0	1.4
Nickel	131/131	Lognormal	NL	NL	25.0	242	70.8	74.5	70.8	74.5
Potassium	131/131	Normal	NL	NL	1,720	10,600	4,410	4,650	4,410	4,650
Selenium	3/131	Not Tested	0.69	3.6	1.0	2.8	0.60	0.65	0.60	0.65
Silver	9/131	Lognormal	0.12	0.57	0.21	0.72	0.12	0.13	0.12	0.13
Sodium	119/131	Lognormal	27	910	48.2	117,000	20,800	33,400	20,800	33,400
Thallium	10/131	Lognormal	0.4	1.9	0.66	5.4	0.40	0.44	0.40	0.44

TABLE M-4 (Continued)

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Vanadium	131/131	Normal	NL	NL	32.3	130	67.4	69.9	67.4	69.9
Zinc	131/131	Lognormal	NL	NL	40.4	959	142	155	142	155
Volatile Organic Compound										
2-Butanone	2/20	Not Tested	0.012	0.11	0.04	0.07	0.02	0.03	0.02	0.03
Carbon disulfide	4/20	Lognormal	0.012	0.043	0.007	0.2	0.02	0.03	0.02	0.03
Chloromethane	1/20	Not Tested	0.012	0.043	0.01	0.01	0.01	0.01	0.01	0.01
Semivolatile Organic Compound										
1-Methylphenanthrene	1/65	Not Tested	0.034	0.79	0.04	0.04	0.09	0.1	0.04	0.04
2,4-Dimethylphenol	1/85	Not Tested	0.034	1.4	0.02	0.02	0.2	0.2	0.02	0.02
2,6-Dimethylnaphthalene	4/65	Lognormal	0.034	0.79	0.05	0.1	0.08	0.1	0.08	0.1
2-Methylnaphthalene	1/85	Not Tested	0.034	1.4	0.04	0.04	0.2	0.2	0.04	0.04
4-Methylphenol	5/85	Lognormal	0.034	1.4	0.03	0.7	0.2	0.2	0.2	0.2
Acenaphthene	4/85	Lognormal	0.034	1.4	0.02	0.7	0.2	0.2	0.2	0.2
Anthracene	5/85	Lognormal	0.034	1.4	0.03	1	0.2	0.2	0.2	0.2
Benzo(a)anthracene	15/85	Lognormal	0.034	1.4	0.01	2	0.2	0.2	0.2	0.2
Benzo(a)pyrene	15/85	Lognormal	0.034	1.4	0.01	2	0.2	0.2	0.2	0.2
Benzo(b)fluoranthene	17/85	Lognormal	0.034	1.4	0.006	2	0.2	0.2	0.2	0.2
Benzo(e)pyrene	12/65	Lognormal	0.034	0.79	0.01	0.2	0.08	0.1	0.08	0.1
Benzo(g,h,i)perylene	12/85	Lognormal	0.034	1.4	0.02	0.5	0.2	0.2	0.2	0.2
Benzo(k)fluoranthene	13/85	Lognormal	0.034	1.4	0.01	0.8	0.2	0.2	0.2	0.2
Benzoic acid	20/65	Lognormal	0.086	2	0.02	0.9	0.2	0.3	0.2	0.3

TABLE M-4 (Continued)

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Bis(2-ethlhexyl)phthalate	2/85	Not Tested	0.035	1.4	0.09	0.2	0.2	0.2	0.2	0.2
Carbazole	3/85	Not Tested	0.034	1.4	0.02	1	0.2	0.2	0.2	0.2
Chrysene	19/85	Lognormal	0.034	1.4	0.006	2	0.2	0.2	0.2	0.2
Dibenz(a,h)anthracene	5/85	Lognormal	0.034	1.4	0.01	0.09	0.2	0.2	0.09	0.09
Dibenzofuran	1/85	Not Tested	0.034	1.4	0.5	0.5	0.2	0.2	0.2	0.2
Dibenzothiophene	1/65	Not Tested	0.034	0.79	0.02	0.02	0.09	0.1	0.02	0.02
Diethylphthalate	1/85	Not Tested	0.034	1.4	0.2	0.2	0.2	0.2	0.2	0.2
Fluoranthene	21/85	Lognormal	0.034	1.4	0.01	5	0.2	0.3	0.2	0.3
Fluorene	2/85	Not Tested	0.034	1.4	0.03	0.6	0.2	0.2	0.2	0.2
Indeno(1,2,3-cd)pyrene	12/85	Lognormal	0.034	1.4	0.01	0.5	0.2	0.2	0.2	0.2
Isophorone	1/85	Not Tested	0.034	1.4	0.04	0.04	0.2	0.2	0.04	0.04
Naphthalene	4/85	Lognormal	0.034	1.4	0.02	0.3	0.2	0.2	0.2	0.2
Perylene	7/65	Lognormal	0.034	0.79	0.009	0.1	0.08	0.1	0.08	0.1
Phenanthrene	13/85	Lognormal	0.034	1.4	0.007	6	0.2	0.3	0.2	0.3
Phenol	2/85	Not Tested	0.034	1.4	0.5	0.6	0.2	0.2	0.2	0.2
Pyrene	21/85	Lognormal	0.034	1.4	0.006	4	0.2	0.3	0.2	0.3
Pesticide/Polychlorinated Biphenyl										
2,4'-DDD	31/65	Lognormal	0.0001	0.00048	0.0003	0.007	0.0008	0.001	0.0008	0.001
2,4'-DDE	14/65	Lognormal	0.0001	0.00048	0.0003	0.001	0.0002	0.0002	0.0002	0.0002
2,4'-DDT	32/65	Lognormal	0.0001	0.00048	0.0002	0.005	0.0005	0.0007	0.0005	0.0007
4,4'-DDD	40/85	Lognormal	0.0001	0.014	0.0003	0.03	0.003	0.006	0.003	0.006
4,4'-DDE	55/85	Lognormal	0.0001	0.014	0.0002	0.009	0.002	0.004	0.002	0.004

TABLE M-4 (Continued)

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
4,4'-DDT	42/85	Lognormal	0.0001	0.014	0.0002	0.03	0.003	0.005	0.003	0.005
Aldrin	11/85	Lognormal	0.0001	0.0072	0.0002	0.0008	0.0005	0.0008	0.0005	0.0008
Alpha-chlordane	31/85	Lognormal	0.0001	0.0072	0.0002	0.003	0.0009	0.001	0.0009	0.001
Dieldrin	19/85	Lognormal	0.0001	0.014	0.0002	0.002	0.001	0.002	0.001	0.002
Gamma-BHC (Lindane)	7/85	Lognormal	0.0001	0.0072	0.0003	0.0009	0.0005	0.0008	0.0005	0.0008
Heptachlor	2/85	Not Tested	0.0001	0.0072	0.0003	0.0004	0.0005	0.0007	0.0004	0.0004
Heptachlor epoxide	8/85	Lognormal	0.0001	0.0072	0.0002	0.001	0.0005	0.0007	0.0005	0.0007
Hexachlorobenzene	19/65	Lognormal	0.0001	0.00048	0.0002	0.002	0.0002	0.0002	0.0002	0.0002
Mirex	16/65	Lognormal	0.0001	0.00048	0.00005	0.001	0.0001	0.0002	0.0002	0.0002
PCB-101 (2,2',3,5,5')	26/65	Lognormal	0.0001	0.00048	0.00007	0.001	0.0002	0.0003	0.0002	0.0003
PCB-105 (2,3,3',4,4')	19/65	Lognormal	0.0001	0.00048	0.0001	0.001	0.0002	0.0002	0.0002	0.0002
PCB-118 (2,3',4,4',5)	25/65	Lognormal	0.0001	0.00048	0.00009	0.001	0.0003	0.0004	0.0003	0.0004
PCB-126 (3,3',4,4',5)	13/65	Lognormal	0.0001	0.00057	0.0002	0.004	0.0002	0.0003	0.0002	0.0003
PCB-128 (2,2',3,3',4,4')	7/65	Lognormal	0.0001	0.00057	0.0002	0.0006	0.0001	0.0001	0.0001	0.0001
PCB-138 (2,2',3,4,4',5')	31/65	Lognormal	0.0001	0.00048	0.0002	0.002	0.0004	0.0005	0.0004	0.0005
PCB-153 (2,2',4,4',5,5')	28/65	Lognormal	0.0001	0.00048	0.00007	0.002	0.0003	0.0004	0.0003	0.0004
PCB-170 (2,2',3,3',4,4',5)	6/65	Lognormal	0.0001	0.00057	0.0003	0.0009	0.0001	0.0001	0.0001	0.0001
PCB-18 (2,2',5)	12/65	Lognormal	0.0001	0.00057	0.0001	0.0004	0.0001	0.0001	0.0001	0.0001
PCB-180 (2,2',3,4,4',5,5')	19/65	Lognormal	0.0001	0.00048	0.0001	0.002	0.0002	0.0003	0.0002	0.0003
PCB-187 (2,2',3,4',5,5',6)	15/65	Lognormal	0.0001	0.00079	0.00007	0.0008	0.0002	0.0002	0.0002	0.0002
PCB-195 (2,2',3,3',4,4',5,6)	3/65	Not Tested	0.0001	0.00057	0.0001	0.0004	0.0001	0.0001	0.0001	0.0001
PCB-206 (2,2',3,3',4,4',5,5',6)	19/65	Lognormal	0.0001	0.00057	0.00005	0.001	0.0002	0.0002	0.0002	0.0002

TABLE M-4 (Continued)

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
PCB-209 (2,2',3,3',4,4',5,5',6,6')	2/65	Not Tested	0.0001	0.00057	0.0002	0.0004	0.0001	0.0001	0.0001	0.0001
PCB-28 (2,4,4')	2/65	Not Tested	0.0001	0.00057	0.0004	0.0005	0.0001	0.0001	0.0001	0.0001
PCB-44 (2,2',3,5')	3/65	Not Tested	0.0001	0.00057	0.0002	0.0003	0.0001	0.0001	0.0001	0.0001
PCB-52 (2,2',5,5')	20/65	Lognormal	0.0001	0.00057	0.00006	0.001	0.0002	0.0002	0.0002	0.0002
PCB-66 (2,3',4,4')	14/65	Lognormal	0.0001	0.00048	0.00009	0.001	0.0002	0.0002	0.0002	0.0002
PCB-77 (3,3',4,4')	15/65	Lognormal	0.0001	0.00057	0.00009	0.001	0.0002	0.0003	0.0002	0.0003
PCB-8 (2,4')	20/65	Lognormal	0.0001	0.00093	0.0003	0.004	0.0003	0.0005	0.0004	0.0005
Trans-nonachlor	29/65	Lognormal	0.00011	0.00048	0.0002	0.002	0.0005	0.0007	0.0005	0.0007

TABLE M-5

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SURFACE WATER ANALYSES
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/l)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	42/51	Lognormal	0.0528	0.149	0.048	37.7	1.0	1.9	1.0	1.9
Antimony	1/51	Not Tested	0.0016	0.008	0.0035	0.0035	0.0012	0.0013	0.0012	0.0013
Arsenic	30/51	Lognormal	0.0014	0.0139	0.0015	0.024	0.0049	0.0063	0.0049	0.0063
Barium	51/51	Lognormal	NL	NL	0.019	0.32	0.085	0.11	0.085	0.11
Cadmium	9/51	Lognormal	0.0002	0.0013	0.00042	0.0083	0.00037	0.00053	0.00037	0.00053
Calcium	51/51	Lognormal	NL	NL	18.5	555	172	248	172	248
Chromium	22/51	Lognormal	0.0004	0.0119	0.0014	0.10	0.0027	00042	0.0027	0.0042
Cobalt	36/51	Lognormal	0.0005	0.002	0.00051	0.13	0.013	0.029	0.013	0.029
Copper	33/51	Lognormal	0.0025	0.0073	0.0034	0.082	0.0084	0.011	0.0084	0.011
Iron	51/51	Lognormal	NL	NL	0.29	239	10.8	20.9	10.8	20.9
Lead	10/51	Lognormal	0.0008	0.004	0.0015	0.057	0.0019	0.0028	0.0019	0.0028
Magnesium	51/51	Lognormal	NL	NL	24.0	1,540	292	415	292	415
Manganese	51/51	Lognormal	NL	NL	0.029	11.3	2.6	5.8	2.6	5.8
Mercury	4/50	Lognormal	0.0001	0.0002	0.00026	0.00065	0.000081	0.000095	0.000080	0.000095
Molybdenum	22/51	Lognormal	0.0006	0.008	0.0014	0.020	0.0033	0.0051	0.0033	0.0051
Nickel	31/51	Lognormal	0.0033	0.0702	0.0039	0.21	0.024	0.041	0.024	0.041
Potassium	51/51	Lognormal	NL	NL	6.7	309	60.8	78.7	60.8	78.7
Selenium	4/51	Lognormal	0.0023	0.0115	0.0024	0.0041	0.0018	0.0020	0.0018	0.0020
Sodium	51/51	Lognormal	NL	NL	147	9,360	1,850	2,550	1,850	2,550
Thallium	3/51	Not Tested	0.0019	0.0095	0.0024	0.0081	0.0017	0.0020	0.0017	0.0020
Vanadium	29/51	Lognormal	0.0004	0.0043	0.0018	0.14	0.0071	0.011	0.0071	0.011
Zinc	27/51	Lognormal	0.0056	0.0654	0.0090	0.35	0.042	0.061	0.042	0.061

TABLE M-5 (Continued)

SITE 2 - R AREA DISPOSAL
STATISTICAL SUMMARY OF SURFACE WATER ANALYSES
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/l)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Volatile Organic Compound										
Chloromethane	1/51	Not Tested	0.01	0.01	0.01	0.01	0.005	0.005	0.005	0.005
Pesticide/Polychlorinated Biphenyl										
4,4'-DDT	1/50	Not Tested	0.0001	0.0005	0.00003	0.00003	0.00005	0.00006	0.00003	0.00003
Aldrin	2/50	Not Tested	0.00005	0.00025	0.00001	0.00003	0.00003	0.00003	0.00003	0.00003
Alpha-BHC	3/50	Not Tested	0.00005	0.00025	0.00003	0.00007	0.00003	0.00003	0.00003	0.00003
Alpha-Chlordane	1/50	Not Tested	0.00005	0.00025	0.00004	0.00004	0.00003	0.00003	0.00003	0.00003
Beta-BHC	1/50	Not Tested	0.00005	0.00025	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003
Dieldrin	1/50	Not Tested	0.0001	0.0005	0.00003	0.00003	0.00005	0.00006	0.00003	0.00003
Endrin	1/50	Not Tested	0.0001	0.0005	0.00003	0.00003	0.00005	0.00006	0.00003	0.00003
Gamma-BHC (Lindane)	1/50	Not Tested	0.00005	0.00025	0.00001	0.00001	0.00003	0.00003	0.00001	0.00001
Heptachlor	2/50	Not Tested	0.00005	0.00025	0.00001	0.0001	0.00003	0.00003	0.00003	0.00003
Heptachlor Epoxide	2/50	Not Tested	0.00001	0.00005	0.00001	0.00004	0.000006	0.000007	0.00001	0.00001

TABLE M-6

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	11/11	Lognormal	NL	NL	9,200	37,500	14,500	19,100	14,500	19,100
Arsenic	8/11	Normal	1.1	4	4.5	18.0	7.3	10.4	7.3	10.4
Barium	11/11	Normal	NL	NL	43.8	234	141	172	141	172
Cadmium	4/11	Lognormal	0.04	0.21	0.32	1.1	0.29	1.7	0.29	1.1
Calcium	11/11	Normal	NL	NL	3,390	12,800	6,780	8,480	6,780	8,480
Chromium	11/11	Lognormal	NL	NL	15.3	106	40.1	58.2	40.1	58.2
Cobalt	11/11	Normal	NL	NL	7.1	18.1	10.6	12.3	10.6	12.3
Copper	11/11	Normal	NL	NL	16.5	86.0	43.9	56.2	43.9	56.2
Iron	11/11	Lognormal	NL	NL	11,900	47,100	20,000	25,000	20,000	25,000
Lead	11/11	Lognormal	NL	NL	7.5	515	160	870	160	515
Magnesium	11/11	Normal	NL	NL	3,890	15,400	8,030	9,700	8,030	9,700
Manganese	11/11	Lognormal	NL	NL	171	706	319	455	319	455
Mercury	11/11	Normal	NL	NL	0.070	0.49	0.23	0.31	0.23	0.31
Nickel	11/11	Normal	NL	NL	15.6	90.9	48.6	59.9	48.6	59.9
Potassium	11/11	Normal	NL	NL	823	6,510	2,960	3,740	2,960	3,740
Silver	4/11	Lognormal	0.13	0.35	0.18	0.50	0.17	0.30	0.17	0.30
Sodium	11/11	Lognormal	NL	NL	1,160	17,700	5,500	12,800	5,500	12,800
Thallium	1/11	Not Tested	0.5	1.2	0.64	0.64	0.38	0.46	0.38	0.46
Vanadium	11/11	Lognormal	NL	NL	34.4	113	53.5	66.7	53.5	66.7
Zinc	11/11	Lognormal	NL	NL	27.5	436	152	282	152	282
Semivolatile Organic Compound										
1,1'-Biphenyl	1/9	Not Tested	0.041	0.66	0.009	0.009	0.1	0.2	0.009	0.009

TABLE M-6 (Continued)

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
1-Methylnaphthalene	2/9	Not Tested	0.041	0.66	0.005	0.03	0.1	0.2	0.03	0.03
2,4-Dimethylphenol	2/11	Not Tested	0.041	0.72	0.005	0.01	0.1	0.2	0.01	0.01
2,6-Dimethylnaphthalene	3/9	Not Tested	0.041	0.66	0.005	0.04	0.09	0.2	0.04	0.04
2-Methylnaphthalene	2/11	Not Tested	0.041	0.72	0.009	0.05	0.1	0.2	0.05	0.05
4-Methylphenol	1/11	Not Tested	0.041	0.72	0.005	0.005	0.1	0.2	0.005	0.005
Acenaphthylene	1/11	Not Tested	0.041	0.72	0.03	0.03	0.1	0.2	0.03	0.03
Anthracene	1/11	Not Tested	0.041	0.72	0.04	0.04	0.1	0.2	0.04	0.04
Benzo(a)anthracene	3/11	Not Tested	0.041	0.72	0.05	0.09	0.1	0.2	0.09	0.09
Benzo(a)pyrene	2/11	Not Tested	0.041	0.72	0.1	0.1	0.1	0.2	0.1	0.1
Benzo(b)fluoranthene	2/11	Not Tested	0.041	0.72	0.1	0.2	0.1	0.2	0.1	0.2
Benzo(e)pyrene	1/9	Not Tested	0.041	0.66	0.3	0.3	0.1	0.2	0.1	0.2
Benzo(g,h,i)perylene	2/11	Not Tested	0.041	0.72	0.2	0.2	0.2	0.2	0.2	0.2
Benzo(k)fluoranthene	2/11	Not Tested	0.041	0.72	0.08	0.1	0.1	0.2	0.1	0.1
Benzoic acid	4/9	Normal	0.1	0.84	0.02	0.5	0.2	0.3	0.2	0.3
Bis(2-ethlhexyl)phthalate	1/11	Not Tested	0.041	0.72	3	3	0.4	0.7	0.4	0.7
Carbazole	1/11	Not Tested	0.041	0.72	0.02	0.02	0.1	0.2	0.02	0.02
Chrysene	3/11	Not Tested	0.041	0.72	0.09	0.2	0.1	0.2	0.1	0.2
Dibenzofuran	1/11	Not Tested	0.041	0.72	0.007	0.007	0.1	0.2	0.007	0.007
Fluoranthene	4/11	Normal	0.041	0.72	0.06	0.2	0.1	0.2	0.1	0.2
Fluorene	1/11	Not Tested	0.041	0.72	0.006	0.006	0.1	0.2	0.006	0.006
Indeno(1,2,3-cd)pyrene	1/11	Not Tested	0.041	0.72	0.1	0.1	0.1	0.2	0.1	0.1
Naphthalene	1/11	Not Tested	0.041	0.72	0.01	0.01	0.1	0.2	0.01	0.01

TABLE M-6 (Continued)

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Phenanthrene	3/11	Not Tested	0.041	0.72	0.03	0.05	0.1	0.2	0.05	0.05
Pyrene	3/11	Not Tested	0.041	0.72	0.1	0.2	0.1	0.2	0.1	0.2
Pesticide/Polychlorinated Biphenyl										
2,4'-DDD	3/9	Not Tested	0.0001	0.0005	0.0003	0.005	0.0008	0.002	0.0008	0.002
2,4'-DDE	3/9	Not Tested	0.0001	0.0005	0.0005	0.0006	0.0003	0.0004	0.0003	0.0004
2,4'-DDT	3/9	Not Tested	0.0001	0.0005	0.001	0.002	0.0006	0.001	0.0006	0.001
4,4'-DDD	6/11	Lognormal	0.0001	0.073	0.0003	0.01	0.01	0.4	0.01	0.01
4,4'-DDE	7/11	Lognormal	0.0001	0.0042	0.0003	0.02	0.005	0.07	0.005	0.02
4,4'-DDT	5/11	Lognormal	0.0001	0.0042	0.0006	0.02	0.008	0.3	0.008	0.02
Aldrin	1/11	Not Tested	0.0001	0.036	0.0004	0.0004	0.002	0.005	0.0004	0.0004
Alpha-chlordane	7/11	Lognormal	0.0001	0.0021	0.0003	0.04	0.003	0.04	0.003	0.04
Dieldrin	2/11	Not Tested	0.0001	0.073	0.0004	0.0008	0.004	0.01	0.0008	0.0008
Gamma-BHC (Lindane)	1/11	Not Tested	0.0001	0.036	0.0004	0.0004	0.002	0.005	0.0004	0.0004
Gamma-chlordane	1/2	Not Tested	0.0021	0.0021	0.03	0.03	0.01	0.09	0.01	0.03
Hexachlorobenzene	1/9	Not Tested	0.0001	0.0005	0.0005	0.0005	0.0002	0.0003	0.0002	0.0003
PCB-101 (2,2',3,5,5')	2/9	Not Tested	0.0001	0.0005	0.0001	0.0004	0.0002	0.0002	0.0002	0.0002
PCB-105 (2,3,3',4,4')	1/9	Not Tested	0.0001	0.0005	0.0002	0.0002	0.0001	0.0002	0.0001	0.0002
PCB-118 (2,3',4,4',5)	2/9	Not Tested	0.0001	0.0005	0.0001	0.0002	0.0001	0.0002	0.0001	0.0002
PCB-126 (3,3',4,4',5)	2/9	Not Tested	0.0001	0.0005	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001
PCB-128 (2,2',3,3',4,4')	3/9	Not Tested	0.0001	0.0005	0.0001	0.002	0.0004	0.0007	0.0004	0.0007
PCB-138 (2,2',3,4,4',5')	3/9	Not Tested	0.0001	0.0005	0.0003	0.002	0.0004	0.0008	0.0004	0.0008
PCB-153 (2,2',4,4',5,5')	3/9	Not Tested	0.0001	0.0005	0.0001	0.0005	0.0002	0.0003	0.0002	0.0003

TABLE M-6 (Continued)

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
PCB-180 (2,2',3,4,4',5,5')	3/9	Not Tested	0.0001	0.0005	0.0001	0.0004	0.0002	0.0002	0.0002	0.0002
PCB-187 (2,2',3,4',5,5',6)	2/9	Not Tested	0.0001	0.0005	0.00007	0.0002	0.0001	0.0002	0.0001	0.0002
PCB-206 (2,2',3,3',4,4',5,5',6)	4/9	Lognormal	0.0001	0.0005	0.0002	0.0008	0.0003	0.0006	0.0003	0.0006
PCB-209 (2,2',3,3',4,4',5,5',6,6')	2/9	Not Tested	0.0001	0.0005	0.00008	0.0003	0.0001	0.0002	0.0002	0.0002
PCB-77 (3,3',4,4')	1/9	Not Tested	0.0001	0.0005	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002
Technical chlordane	2/2	Not Tested	NL	NL	0.02	0.2	0.1	0.6	0.1	0.2
Trans-nonachlor	6/9	Lognormal	0.0001	0.0005	0.0002	0.004	0.001	0.006	0.001	0.004

TABLE M-7

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	18/18	Lognormal	NL	NL	4,810	37,500	14,200	18,300	14,200	18,300
Arsenic	15/18	Lognormal	1.1	4	4.5	26.6	9.6	16.6	9.6	16.6
Barium	18/18	Normal	NL	NL	27.7	234	110	137	110	137
Cadmium	5/18	Lognormal	0.04	0.23	0.32	1.1	0.21	0.56	0.21	0.56
Calcium	18/18	Lognormal	NL	NL	3,390	14,600	6,880	8,510	6,880	8,510
Chromium	18/18	Lognormal	NL	NL	15.3	106	42.1	55.4	42.1	55.4
Cobalt	18/18	Normal	NL	NL	3.6	18.1	9.7	11.0	9.7	11.0
Copper	18/18	Lognormal	NL	NL	13.1	86.0	38.2	49.7	38.2	49.7
Iron	18/18	Lognormal	NL	NL	5,860	47,100	19,100	23,900	19,100	23,900
Lead	18/18	Lognormal	NL	NL	3.5	515	94.3	319	94.3	319
Magnesium	18/18	Normal	NL	NL	3,890	15,400	8,990	10,200	8,990	10,200
Manganese	18/18	Lognormal	NL	NL	60.7	706	273	371	273	371
Mercury	14/18	Lognormal	0.11	0.28	0.070	0.49	0.19	0.28	0.19	0.28
Molybdenum	4/18	Lognormal	0.22	1.6	2.9	3.9	1.0	3.0	1.0	3.0
Nickel	18/18	Normal	NL	NL	15.6	90.9	50.2	58.2	50.2	58.2
Potassium	18/18	Normal	NL	NL	823	6,510	3,100	3,630	3,100	3,630
Silver	4/18	Lognormal	0.13	0.68	0.18	0.50	0.18	0.26	0.18	0.26
Sodium	18/18	Lognormal	NL	NL	1,160	60,400	13,700	32,700	13,700	32,700
Thallium	2/18	Not Tested	0.48	2.3	0.64	2.0	0.54	0.72	0.54	0.72
Vanadium	18/18	Lognormal	NL	NL	32.6	136	59.4	71.6	59.4	71.6
Zinc	18/18	Lognormal	NL	NL	27.5	436	119	173	119	173

TABLE M-7 (Continued)

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Volatile Organic Compound										
4-Methyl-2-pentanone	1/9	Not Tested	0.011	0.14	0.03	0.03	0.02	0.03	0.02	0.03
Semivolatile Organic Compound										
1,1'-Biphenyl	1/9	Not Tested	0.041	0.66	0.009	0.009	0.1	0.2	0.009	0.009
1-Methylnaphthalene	2/9	Not Tested	0.041	0.66	0.005	0.03	0.1	0.2	0.03	0.03
2,4-Dimethylphenol	2/18	Not Tested	0.041	1.9	0.005	0.01	0.3	0.4	0.01	0.01
2,6-Dimethylnaphthalene	3/9	Not Tested	0.041	0.66	0.005	0.04	0.09	0.2	0.04	0.04
2-Methylnaphthalene	2/17	Not Tested	0.041	1.6	0.009	0.05	0.3	0.4	0.05	0.05
4-Methylphenol	1/18	Not Tested	0.041	1.9	0.005	0.005	0.3	0.4	0.005	0.005
Acenaphthylene	1/17	Not Tested	0.041	1.6	0.03	0.03	0.3	0.4	0.03	0.03
Anthracene	1/17	Not Tested	0.041	1.6	0.04	0.04	0.3	0.4	0.04	0.04
Benzo(a)anthracene	3/17	Not Tested	0.041	1.6	0.05	0.09	0.2	0.4	0.09	0.09
Benzo(a)pyrene	2/17	Not Tested	0.041	1.6	0.1	0.1	0.3	0.4	0.1	0.1
Benzo(b)fluoranthene	2/17	Not Tested	0.041	1.6	0.1	0.2	0.3	0.4	0.2	0.2
Benzo(e)pyrene	1/9	Not Tested	0.041	0.66	0.3	0.3	0.1	0.2	0.1	0.2
Benzo(g,h,i)perylene	2/17	Not Tested	0.041	1.6	0.2	0.2	0.3	0.4	0.2	0.2
Benzo(k)fluoranthene	2/17	Not Tested	0.041	1.6	0.08	0.1	0.3	0.4	0.1	0.1
Benzoic acid	4/9	Normal	0.1	0.84	0.02	0.5	0.2	0.3	0.2	0.3
Bis(2-ethlhexyl)phthalate	1/17	Not Tested	0.041	1.6	3	3	0.4	0.6	0.4	0.6
Carbazole	1/17	Not Tested	0.041	1.6	0.02	0.02	0.3	0.4	0.02	0.02
Chrysene	3/17	Not Tested	0.041	1.6	0.09	0.2	0.3	0.4	0.2	0.2

TABLE M-7 (Continued)

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Dibenzofuran	1/17	Not Tested	0.041	1.6	0.007	0.007	0.3	0.4	0.007	0.007
Fluoranthene	4/17	Lognormal	0.041	1.6	0.06	0.2	0.3	0.8	0.2	0.2
Fluorene	1/17	Not Tested	0.041	1.6	0.006	0.006	0.3	0.4	0.006	0.006
Indeno(1,2,3-cd)pyrene	1/17	Not Tested	0.041	1.6	0.1	0.1	0.3	0.4	0.1	0.1
Naphthalene	1/17	Not Tested	0.041	1.6	0.01	0.01	0.3	0.4	0.01	0.01
Phenanthrene	3/17	Not Tested	0.041	1.6	0.03	0.05	0.2	0.3	0.05	0.05
Phenol	3/18	Not Tested	0.041	1.9	0.2	0.5	0.3	0.4	0.3	0.4
Pyrene	3/17	Not Tested	0.041	1.6	0.1	0.2	0.3	0.4	0.2	0.2
Pesticide/Polychlorinated Biphenyl										
2,4'-DDD	3/9	Not Tested	0.0001	0.0005	0.0003	0.005	0.0008	0.002	0.0008	0.002
2,4'-DDE	3/9	Not Tested	0.0001	0.0005	0.0005	0.0006	0.0003	0.0004	0.0003	0.0004
2,4'-DDT	3/9	Not Tested	0.0001	0.0005	0.001	0.002	0.0006	0.001	0.0006	0.001
4,4'-DDD	7/18	Lognormal	0.0001	0.073	0.0003	0.01	0.01	0.05	0.01	0.01
4,4'-DDE	7/18	Lognormal	0.0001	0.019	0.0003	0.02	0.007	0.03	0.007	0.02
4,4'-DDT	5/18	Lognormal	0.0001	0.019	0.0006	0.02	0.01	0.06	0.01	0.02
Aldrin	1/18	Not Tested	0.0001	0.036	0.0004	0.0004	0.002	0.004	0.0004	0.0004
Alpha-chlordane	7/18	Lognormal	0.0001	0.0095	0.0003	0.04	0.004	0.01	0.004	0.01
Dieldrin	2/18	Not Tested	0.0001	0.073	0.0004	0.0008	0.004	0.008	0.0008	0.0008
Gamma-BHC (Lindane)	1/18	Not Tested	0.0001	0.036	0.0004	0.0004	0.002	0.004	0.0004	0.0004
Gamma-chlordane	1/9	Not Tested	0.002	0.0095	0.03	0.03	0.005	0.01	0.005	0.01
Hexachlorobenzene	1/9	Not Tested	0.0001	0.0005	0.0005	0.0005	0.0002	0.0003	0.0002	0.0003
PCB-101 (2,2',3,5,5')	2/9	Not Tested	0.0001	0.0005	0.0001	0.0004	0.0002	0.0002	0.0002	0.0002

TABLE M-7 (Continued)

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
PCB-105 (2,3,3',4,4')	1/9	Not Tested	0.0001	0.0005	0.0002	0.0002	0.0001	0.0002	0.0001	0.0002
PCB-118 (2,3',4,4',5)	2/9	Not Tested	0.0001	0.0005	0.0001	0.0002	0.0001	0.0002	0.0001	0.0002
PCB-126 (3,3',4,4',5)	2/9	Not Tested	0.0001	0.0005	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001
PCB-128 (2,2',3,3',4,4')	3/9	Not Tested	0.0001	0.0005	0.0001	0.002	0.0004	0.0007	0.0004	0.0007
PCB-138 (2,2',3,4,4',5')	3/9	Not Tested	0.0001	0.0005	0.0003	0.002	0.0004	0.0008	0.0004	0.0008
PCB-153 (2,2',4,4',5,5')	3/9	Not Tested	0.0001	0.0005	0.0001	0.0005	0.0002	0.0003	0.0002	0.0003
PCB-180 (2,2',3,4,4',5,5')	3/9	Not Tested	0.0001	0.0005	0.0001	0.0004	0.0002	0.0002	0.0002	0.0002
PCB-187 (2,2',3,4',5,5',6)	2/9	Not Tested	0.0001	0.0005	0.00007	0.0002	0.0001	0.0002	0.0001	0.0002
PCB-206 (2,2',3,3',4,4',5,5',6)	4/9	Lognormal	0.0001	0.0005	0.0002	0.0008	0.0003	0.0006	0.0003	0.0006
PCB-209 (2,2',3,3',4,4',5,5',6,6')	2/9	Not Tested	0.0001	0.0005	0.00008	0.0003	0.0001	0.0002	0.0002	0.0002
PCB-77 (3,3',4,4')	1/9	Not Tested	0.0001	0.0005	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002
Technical chlordane	2/2	Not Tested	NL	NL	0.02	0.2	0.1	0.6	0.1	0.2
Trans-nonachlor	6/9	Lognormal	0.0001	0.0005	0.0002	0.004	0.001	0.006	0.001	0.004

TABLE M-8

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SURFACE WATER ANALYSES
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/l)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	6/9	Lognormal	0.0397	0.196	0.12	1.6	0.48	3.5	0.48	1.6
Antimony	2/9	Not Tested	0.001	0.0034	0.0010	0.0099	0.0020	0.0038	0.0020	0.0038
Arsenic	9/9	Lognormal	NL	NL	0.0022	0.28	0.037	0.29	0.037	0.28
Barium	9/9	Lognormal	NL	NL	0.11	0.81	0.26	0.43	0.26	0.43
Cadmium	1/9	Not Tested	0.00008	0.0002	0.0011	0.0011	0.00020	0.00041	0.00020	0.00041
Calcium	9/9	Lognormal	NL	NL	68.8	1,950	338	967	338	967
Chromium	2/9	Not Tested	0.0004	0.0027	0.0017	0.0069	0.0017	0.0029	0.0017	0.0029
Cobalt	7/9	Normal	0.00064	0.0014	0.0012	0.0051	0.0023	0.0034	0.0023	0.0034
Copper	8/9	Normal	0.0035	0.0035	0.0029	0.013	0.0074	0.010	0.0071	0.010
Iron	9/9	Lognormal	NL	NL	0.19	8.5	3.2	14.1	3.2	8.5
Lead	1/9	Not Tested	0.00036	0.0062	0.0040	0.0040	0.0011	0.0020	0.0011	0.0020
Magnesium	9/9	Lognormal	NL	NL	55.7	5,280	709	4,210	709	4,210
Manganese	9/9	Lognormal	NL	NL	0.21	4.5	1.1	3.0	1.1	3.0
Mercury	2/9	Not Tested	0.0001	0.00021	0.00013	0.00017	0.000084	0.00011	0.000080	0.00011
Molybdenum	6/9	Lognormal	0.0033	0.0034	0.00092	0.0046	0.0018	0.0027	0.0018	0.0027
Nickel	6/9	Lognormal	0.0154	0.0256	0.0038	0.045	0.013	0.024	0.013	0.024
Potassium	9/9	Lognormal	NL	NL	14.8	552	103	312	103	312
Selenium	4/9	Normal	0.0023	0.0039	0.0010	0.0024	0.0017	0.0020	0.0017	0.0020
Silver	2/9	Not Tested	0.00026	0.0013	0.00027	0.00030	0.00033	0.00041	0.00030	0.00030
Sodium	9/9	Lognormal	NL	NL	485	28,300	4,250	18,600	4,250	18,600
Thallium	1/9	Not Tested	0.0013	0.0047	0.0084	0.0084	0.0019	0.0035	0.0019	0.0035
Vanadium	7/9	Lognormal	0.0016	0.002	0.0041	0.030	0.011	0.049	0.011	0.030
Zinc	2/9	Not Tested	0.0084	0.058	0.022	0.095	0.022	0.040	0.022	0.040

TABLE M-8 (Continued)

SITE 9 - FROID & TAYLOR ROADS
STATISTICAL SUMMARY OF SURFACE WATER ANALYSES
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/l)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Volatile Organic Compound										
Carbon Disulfide	1/6	Not Tested	0.01	0.01	0.02	0.02	0.008	0.01	0.008	0.01
Semivolatile Organic Compound										
4-Methylphenol	1/9	Not Tested	0.01	0.05	0.003	0.003	0.007	0.01	0.003	0.003
Chrysene	1/9	Not Tested	0.01	0.05	0.0006	0.0006	0.007	0.01	0.0006	0.0006
Phenol	1/9	Not Tested	0.01	0.05	0.0009	0.0009	0.007	0.01	0.0009	0.0009

TABLE M-9

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	75/75	Lognormal	NL	NL	3,340	42,700	15,300	17,100	15,300	17,100
Antimony	51/75	Lognormal	0.43	2.9	0.44	7.1	1.6	2.0	1.6	2.0
Arsenic	70/75	Lognormal	0.3	5.2	1.3	27.1	9.5	12.1	9.5	12.1
Barium	75/75	Normal	NL	NL	3.5	353	125	140	125	140
Beryllium	31/75	Lognormal	0.02	0.19	0.010	0.84	0.14	0.23	0.14	0.23
Cadmium	32/75	Lognormal	0.02	1.1	0.050	20.8	1.3	3.3	1.3	3.3
Calcium	75/75	Lognormal	NL	NL	1,200	84,000	8,040	9,450	8,040	9,450
Chromium	75/75	Lognormal	NL	NL	6.4	122	38.6	43.5	38.6	43.5
Chromium VI	1/3	Not Tested	0.002	0.05	0.060	0.060	0.029	0.079	0.029	0.060
Cobalt	75/75	Lognormal	NL	NL	2.4	39.3	14.6	16.3	14.6	16.3
Copper	72/75	Lognormal	24	49	6.1	607	53.1	65.0	53.1	65.0
Iron	75/75	Lognormal	NL	NL	3,570	73,300	28,600	32,400	28,600	32,400
Lead	75/75	Lognormal	NL	NL	1.8	598	67.9	101	67.9	101
Magnesium	75/75	Lognormal	NL	NL	2,280	22,400	9,040	10,000	9,040	10,000
Manganese	75/75	Normal	NL	NL	55.3	1,270	484	533	484	533
Mercury	56/75	Lognormal	0.05	0.58	0.030	18.5	0.45	0.70	0.45	0.70
Molybdenum	27/75	Lognormal	0.13	3.2	0.25	5.6	0.72	1.1	0.72	1.1
Nickel	75/75	Lognormal	NL	NL	6.3	123	44.5	51.2	44.5	51.2
Potassium	75/75	Normal	NL	NL	353	6,520	2,400	2,670	2,400	2,670
Selenium	4/75	Lognormal	0.48	4.3	0.67	3.5	0.60	0.68	0.60	0.68
Silver	9/75	Lognormal	0.11	1.6	0.16	4.4	0.21	0.26	0.21	0.26
Sodium	74/75	Lognormal	53	53	36.9	23,400	4,300	6,330	4,300	6,330

TABLE M-9 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Thallium	9/75	Lognormal	0.08	2	0.69	2.4	0.39	0.48	0.39	0.48
Vanadium	75/75	Normal	NL	NL	15.3	139	61.1	66.7	61.1	66.7
Zinc	70/75	Lognormal	19	38	28.6	3,010	235	319	235	319
Semivolatile Organic Compound										
1-Methylphenanthrene	2/47	Not Tested	0.035	22	0.03	0.4	0.7	1	0.4	0.4
2,6-Dimethylnaphthalene	1/47	Not Tested	0.035	22	0.04	0.04	0.7	1	0.04	0.04
Acenaphthene	4/56	Lognormal	0.035	22	0.03	0.3	0.6	1	0.3	0.3
Acenaphthylene	1/56	Not Tested	0.035	22	0.3	0.3	0.6	1	0.3	0.3
Anthracene	10/56	Lognormal	0.035	22	0.01	2	0.6	1	0.6	1
Benzo(a)anthracene	12/56	Lognormal	0.035	22	0.01	4	0.6	1	0.6	1
Benzo(a)pyrene	14/56	Lognormal	0.035	22	0.02	3	0.6	1	0.6	1
Benzo(b)fluoranthene	15/56	Lognormal	0.035	22	0.03	3	0.6	1	0.6	1
Benzo(e)pyrene	24/47	Lognormal	0.035	22	0.02	2	0.6	1	0.6	1
Benzo(g,h,i)perylene	11/56	Lognormal	0.035	22	0.02	1	0.5	0.9	0.5	0.9
Benzo(k)fluoranthene	13/56	Lognormal	0.035	22	0.02	3	0.6	1	0.6	1
Benzoic Acid	8/47	Lognormal	0.021	53	0.04	2	2	4	2	2
Butylbenzylphthalate	1/56	Not Tested	0.035	22	0.08	0.08	0.6	1	0.08	0.08
Carbazole	12/56	Lognormal	0.035	22	0.02	0.9	0.5	0.9	0.5	0.9
Chrysene	18/56	Lognormal	0.035	22	0.02	6	0.7	1	0.7	1
Dibenz(a,h)anthracene	4/56	Lognormal	0.035	22	0.03	0.6	0.5	0.9	0.5	0.6
Dibenzofuran	2/56	Not Tested	0.035	22	0.08	0.2	0.6	1	0.2	0.2
Dibenzothiophene	3/47	Not Tested	0.035	22	0.03	0.2	0.7	1	0.2	0.2

TABLE M-9 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Fluoranthene	31/56	Lognormal	0.035	22	0.01	14	0.7	1	0.7	1
Fluorene	4/56	Lognormal	0.035	22	0.02	0.4	0.6	1	0.4	0.4
Indeno(1,2,3-cd)pyrene	9/56	Lognormal	0.035	22	0.02	1	0.6	1	0.6	1
Naphthalene	1/56	Not Tested	0.035	22	0.1	0.1	0.6	1	0.1	0.1
Pentachlorophenol	4/51	Lognormal	0.087	53	0.1	0.8	2	3	0.8	0.8
Perylene	4/47	Lognormal	0.035	22	0.03	0.9	0.7	1	0.7	0.8
Phenanthrene	19/56	Lognormal	0.035	22	0.02	4	0.6	1	0.6	1
Phenol	3/56	Not Tested	0.035	22	0.3	0.9	0.7	1	0.7	0.9
Pyrene	30/56	Lognormal	0.035	22	0.02	13	0.6	1	0.6	1
Pesticide/Polychlorinated Biphenyl										
2,4'-DDD	22/47	Lognormal	0.0001	0.007	0.0003	0.008	0.001	0.002	0.001	0.002
2,4'-DDE	6/47	Lognormal	0.0001	0.007	0.0004	0.003	0.0004	0.0006	0.0004	0.0006
2,4'-DDT	17/47	Lognormal	0.0001	0.007	0.0001	0.03	0.0009	0.002	0.0009	0.002
4,4'-DDD	32/54	Lognormal	0.0001	0.0044	0.0002	0.3	0.007	0.02	0.007	0.02
4,4'-DDE	37/54	Lognormal	0.0001	0.0044	0.0002	0.03	0.003	0.006	0.003	0.006
4,4'-DDT	30/54	Lognormal	0.0001	0.0044	0.0003	0.2	0.006	0.02	0.006	0.02
Aldrin	5/54	Lognormal	0.0001	0.007	0.0002	0.0005	0.0005	0.0007	0.0005	0.0005
Alpha-Chlordane	34/54	Lognormal	0.0001	0.0022	0.0002	0.08	0.003	0.007	0.003	0.007
Dieldrin	14/54	Lognormal	0.0001	0.007	0.0002	0.006	0.001	0.002	0.001	0.002
Gamma-BHC (Lindane)	5/54	Lognormal	0.0001	0.007	0.0004	0.002	0.0005	0.0009	0.0005	0.0009
Heptachlor	3/54	Not Tested	0.0001	0.007	0.0003	0.0007	0.0005	0.0006	0.0005	0.0007
Heptachlor Epoxide	4/54	Lognormal	0.0001	0.007	0.0002	0.006	0.0005	0.0008	0.0005	0.0008

TABLE M-9 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Hexachlorobenzene	4/47	Lognormal	0.0001	0.007	0.0002	0.0004	0.0003	0.0005	0.0003	0.0004
Mirex	10/47	Lognormal	0.0001	0.007	0.0001	0.005	0.0004	0.0007	0.0004	0.0007
PCB-101 (2,2',3,5,5')	24/47	Lognormal	0.0001	0.007	0.00007	0.007	0.0008	0.001	0.0008	0.001
PCB-105 (2,3,3',4,4')	18/47	Lognormal	0.0001	0.007	0.0001	0.003	0.0006	0.0009	0.0006	0.0009
PCB-118 (2,3',4,4',5)	19/47	Lognormal	0.0001	0.007	0.0001	0.005	0.0008	0.001	0.0008	0.001
PCB-126 (3,3',4,4',5)	5/47	Lognormal	0.0001	0.007	0.0001	0.0006	0.0003	0.0005	0.0003	0.0005
PCB-128 (2,2',3,3',4,4')	5/47	Lognormal	0.0001	0.007	0.0002	0.003	0.0004	0.0006	0.0004	0.0006
PCB-138 (2,2',3,4,4',5')	26/47	Lognormal	0.0001	0.006	0.0002	0.01	0.001	0.003	0.002	0.003
PCB-153 (2,2',4,4',5,5')	18/47	Lognormal	0.0001	0.007	0.0001	0.01	0.001	0.002	0.001	0.002
PCB-170 (2,2',3,3',4,4',5)	10/47	Lognormal	0.0001	0.007	0.0001	0.007	0.0005	0.0008	0.0005	0.0008
PCB-18 (2,2',5)	7/47	Lognormal	0.0001	0.007	0.0001	0.0008	0.0003	0.0005	0.0004	0.0005
PCB-180 (2,2',3,4,4',5,5')	20/47	Lognormal	0.0001	0.007	0.0001	0.02	0.001	0.002	0.001	0.002
PCB-187 (2,2',3,4',5,5',6)	17/47	Lognormal	0.0001	0.007	0.00009	0.007	0.0006	0.001	0.0006	0.001
PCB-195 (2,2',3,3',4,4',5,6)	4/47	Lognormal	0.0001	0.007	0.0002	0.001	0.0004	0.0006	0.0004	0.0006
PCB-206 (2,2',3,3',4,4',5,5)	11/47	Lognormal	0.0001	0.007	0.0002	0.0009	0.0004	0.0006	0.0004	0.0006
PCB-209 (2,2',3,3',4,4',5,5')	3/47	Not Tested	0.0001	0.007	0.0002	0.0003	0.0004	0.0006	0.0003	0.0003
PCB-28 (2,4,4')	4/47	Lognormal	0.0001	0.007	0.0002	0.002	0.0004	0.0006	0.0004	0.0006
PCB-44 (2,2',3,5')	8/47	Lognormal	0.0001	0.007	0.0002	0.002	0.0004	0.0007	0.0004	0.0007
PCB-52 (2,2',5,5')	16/47	Lognormal	0.0001	0.007	0.00008	0.002	0.0005	0.0008	0.0005	0.0008
PCB-66 (2,3',4,4')	5/47	Lognormal	0.0001	0.007	0.0002	0.001	0.0004	0.0006	0.0004	0.0006
PCB-77 (3,3',4,4')	2/47	Not Tested	0.0001	0.007	0.0003	0.0009	0.0004	0.0006	0.0004	0.0006
PCB-8 (2,4')	6/47	Lognormal	0.0001	0.007	0.0002	0.006	0.0005	0.0008	0.0005	0.0008

TABLE M-9 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SOIL ANALYSES
0 TO 0.5 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Trans-Nonachlor	33/47	Lognormal	0.0001	0.001	0.0002	0.07	0.003	0.008	0.003	0.008
Explosive										
1,3-Dinitrobenzene	1/7	Not Tested	0.12	0.12	0.1	0.1	0.07	0.09	0.07	0.09
Dioxin/Furan										
2,3,7,8-TCDD TEQ	7/9	Lognormal	0.000007	0.000014	0.000001	0.000343	0.000092	0.002	0.000092	0.000343

TABLE M-10

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	123/123	Lognormal	NL	NL	82.2	42,700	15,600	17,600	15,600	17,600
Antimony	68/122	Lognormal	0.39	2.9	0.44	7.1	1.3	1.6	1.3	1.6
Arsenic	113/123	Lognormal	0.3	5.2	1.3	37.0	9.0	10.7	9.0	10.7
Barium	123/123	Lognormal	NL	NL	1.1	546	152	181	152	181
Beryllium	36/123	Lognormal	0.02	0.19	0.010	0.84	0.094	0.13	0.094	0.13
Cadmium	37/123	Lognormal	0.02	22	0.050	20.8	0.61	1.1	0.61	1.1
Calcium	123/123	Lognormal	NL	NL	132	112,000	8,630	9,990	8,630	9,990
Chromium	121/123	Lognormal	0.36	21	6.4	122	41.5	47.5	41.5	47.5
Chromium VI	1/3	Not Tested	0.002	0.05	0.060	0.060	0.029	0.079	0.029	0.060
Cobalt	122/123	Lognormal	0.13	0.13	1.7	39.3	15.3	17.4	15.3	17.4
Copper	119/123	Lognormal	18	49	0.72	607	45.9	53.6	45.9	53.6
Iron	123/123	Lognormal	NL	NL	367	90,300	28,100	31,700	28,100	31,700
Lead	122/123	Lognormal	3.9	3.9	0.35	728	46.8	63.9	46.8	63.9
Magnesium	123/123	Normal	NL	NL	81.6	22,400	9,060	9,670	9,060	9,670
Manganese	123/123	Lognormal	NL	NL	4.3	1,470	496	573	496	573
Mercury	69/122	Lognormal	0.05	0.58	0.030	18.5	0.27	0.35	0.27	0.35
Molybdenum	42/123	Lognormal	0.13	6.4	0.25	12.9	0.93	1.3	0.93	1.3
Nickel	121/123	Lognormal	0.66	5.2	6.3	123	50.9	58.6	50.9	58.6
Potassium	123/123	Lognormal	NL	NL	59.3	6,520	2,520	2,860	2,520	2,860
Selenium	5/123	Lognormal	0.48	4.4	0.67	4.8	0.66	0.73	0.66	0.73
Silver	10/123	Lognormal	0.11	1.6	0.16	4.4	0.18	0.21	0.18	0.21
Sodium	120/123	Lognormal	29	53	36.9	275,000	8,750	13,400	8,750	13,400

TABLE M-10 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Thallium	11/123	Lognormal	0.08	2.4	0.69	2.4	0.44	0.51	0.44	0.51
Vanadium	123/123	Lognormal	NL	NL	0.28	163	65.5	73.4	65.5	73.4
Zinc	112/123	Lognormal	7.7	82	27.7	3,010	173	217	173	217
Volatile Organic Compound										
2-Butanone	3/53	Not Tested	0.011	0.11	0.02	0.7	0.03	0.05	0.03	0.05
Acetone	1/53	Not Tested	0.011	1.7	0.3	0.3	0.07	0.1	0.07	0.1
Carbon Disulfide	7/53	Lognormal	0.011	0.077	0.02	0.3	0.02	0.02	0.02	0.02
Ethylbenzene	1/54	Not Tested	0.011	0.059	0.2	0.2	0.01	0.02	0.01	0.02
Xylene (total)	3/54	Not Tested	0.011	0.059	0.03	0.2	0.01	0.02	0.01	0.02
Semivolatile Organic Compound										
1-Methylphenanthrene	2/47	Not Tested	0.035	22	0.03	0.4	0.7	1	0.4	0.4
2,6-Dimethylnaphthalene	1/47	Not Tested	0.035	22	0.04	0.04	0.7	1	0.04	0.04
Acenaphthene	4/105	Lognormal	0.035	22	0.03	0.3	0.5	0.7	0.3	0.3
Acenaphthylene	1/105	Not Tested	0.035	22	0.3	0.3	0.6	0.8	0.3	0.3
Anthracene	10/105	Lognormal	0.035	22	0.01	2	0.5	0.7	0.5	0.7
Benzo(a)anthracene	12/105	Lognormal	0.035	22	0.01	4	0.5	0.7	0.5	0.7
Benzo(a)pyrene	14/105	Lognormal	0.035	22	0.02	3	0.5	0.7	0.5	0.7
Benzo(b)fluoranthene	16/105	Lognormal	0.035	22	0.03	3	0.5	0.7	0.5	0.7
Benzo(e)pyrene	24/47	Lognormal	0.035	22	0.02	2	0.6	1	0.6	1
Benzo(g,h,i)perylene	11/105	Lognormal	0.035	22	0.02	1	0.5	0.7	0.5	0.7
Benzo(k)fluoranthene	13/105	Lognormal	0.035	22	0.02	3	0.5	0.7	0.5	0.7

TABLE M-10 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Benzoic Acid	8/47	Lognormal	0.021	53	0.04	2	2	4	2	2
Butylbenzylphthalate	1/105	Not Tested	0.035	22	0.08	0.08	0.6	0.8	0.08	0.08
Carbazole	13/105	Lognormal	0.035	22	0.02	0.9	0.5	0.6	0.5	0.6
Chrysene	19/105	Lognormal	0.035	22	0.02	6	0.5	0.7	0.5	0.7
Dibenz(a,h)anthracene	4/105	Lognormal	0.035	22	0.03	0.6	0.5	0.6	0.5	0.6
Dibenzofuran	2/105	Not Tested	0.035	22	0.08	0.2	0.6	0.8	0.2	0.2
Dibenzothiophene	3/47	Not Tested	0.035	22	0.03	0.2	0.7	1	0.2	0.2
Fluoranthene	32/105	Lognormal	0.035	22	0.01	14	0.6	0.7	0.6	0.7
Fluorene	4/105	Lognormal	0.035	22	0.02	0.4	0.5	0.7	0.4	0.4
Indeno(1,2,3-cd)pyrene	9/105	Lognormal	0.035	22	0.02	1	0.5	0.7	0.5	0.7
Naphthalene	1/105	Not Tested	0.035	22	0.1	0.1	0.6	0.8	0.1	0.1
Pentachlorophenol	4/100	Lognormal	0.087	53	0.1	0.8	1	2	0.8	0.8
Perylene	4/47	Lognormal	0.035	22	0.03	0.8	0.7	1	0.7	0.8
Phenanthrene	20/105	Lognormal	0.035	22	0.02	4	0.5	0.7	0.5	0.7
Phenol	16/105	Lognormal	0.035	22	0.2	5	0.7	0.9	0.7	0.9
Pyrene	31/105	Lognormal	0.035	22	0.02	13	0.5	0.7	0.5	0.7
Pesticide/Polychlorinated Biphenyl										
2,4'-DDD	22/47	Lognormal	0.0001	0.007	0.0003	0.008	0.001	0.002	0.001	0.002
2,4'-DDE	6/47	Lognormal	0.0001	0.007	0.0004	0.003	0.0004	0.0006	0.0004	0.0006
2,4'-DDT	17/47	Lognormal	0.0001	0.007	0.0001	0.03	0.0009	0.002	0.0009	0.002
4,4'-DDD	36/100	Lognormal	0.0001	0.04	0.0002	0.3	0.007	0.01	0.007	0.01
4,4'-DDE	38/100	Lognormal	0.0001	0.04	0.0002	0.03	0.005	0.007	0.005	0.007

TABLE M-10 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
4,4'-DDT	33/100	Lognormal	0.0001	0.04	0.003	0.2	0.007	0.01	0.007	0.01
Aldrin	5/100	Lognormal	0.0001	0.02	0.0002	0.0005	0.002	0.002	0.0005	0.0005
Alpha-Chlordane	35/100	Lognormal	0.0001	0.02	0.0002	0.08	0.003	0.004	0.003	0.004
Dieldrin	14/100	Lognormal	0.0001	0.04	0.0002	0.006	0.004	0.006	0.004	0.006
Endrin Ketone	1/53	Not Tested	.0035	0.04	0.004	0.004	0.004	0.005	0.004	0.004
Gamma-BHC (Lindane)	5/100	Lognormal	0.0001	0.02	0.0004	0.002	0.092	0.002	0.002	0.002
Heptachlor	3/100	Not Tested	0.0001	0.02	0.0003	0.0007	0.001	0.002	0.0007	0.0007
Heptachlor Epoxide	4/100	Lognormal	0.0001	0.02	0.0002	0.006	0.002	0.003	0.002	0.003
Hexachlorobenzene	4/47	Lognormal	0.0001	0.007	0.0002	0.0004	0.0003	0.0005	0.0003	0.0004
Mirex	10/47	Lognormal	0.0001	0.007	0.0001	0.005	0.0004	0.0007	0.0004	0.0007
PCB-101 (2,2',3,5,5')	24/47	Lognormal	0.0001	0.007	0.00007	0.007	0.0008	0.001	0.0008	0.001
PCB-105 (2,3,3',4,4')	18/47	Lognormal	0.0001	0.007	0.0001	0.003	0.0006	0.0009	0.0006	0.0009
PCB-118 (2,3',4,4',5)	19/47	Lognormal	0.0001	0.007	0.0001	0.005	0.0008	0.001	0.0008	0.001
PCB-126 (3,3',4,4',5)	5/47	Lognormal	0.0001	0.007	0.0001	0.0006	0.0003	0.0005	0.0003	0.0005
PCB-128 (2,2',3,3',4,4')	5/47	Lognormal	0.0001	0.007	0.0002	0.003	0.0004	0.0006	0.0004	0.0006
PCB-138 (2,2',3,4,4',5')	26/47	Lognormal	0.0001	0.006	0.0002	0.01	0.001	0.003	0.002	0.003
PCB-153 (2,2',4,4',5,5')	18/47	Lognormal	0.0001	0.007	0.0001	0.01	0.001	0.002	0.001	0.002
PCB-170 (2,2',3,3',4,4',5)	10/47	Lognormal	0.0001	0.007	0.0001	0.007	0.0005	0.0008	0.0005	0.0008
PCB-18 (2,2',5)	7/47	Lognormal	0.0001	0.007	0.0001	0.0008	0.0003	0.0005	0.0004	0.0005
PCB-180 (2,2',3,4,4',5,5')	20/47	Lognormal	0.0001	0.007	0.0001	0.02	0.001	0.002	0.001	0.002
PCB-187 (2,2',3,4',5,5',6)	17/47	Lognormal	0.0001	0.007	0.00009	0.007	0.0006	0.001	0.0006	0.001
PCB-195 (2,2',3,3',4,4',5,6)	4/47	Lognormal	0.0001	0.007	0.0002	0.001	0.0004	0.0006	0.0004	0.0006

TABLE M-10 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SUBSURFACE SOIL ANALYSES
0 TO 10 FEET BELOW GROUND SURFACE
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/kg)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
PCB-206 (2,2',3,3',4,4',5,5)	11/47	Lognormal	0.0001	0.007	0.0002	0.0009	0.0004	0.0006	0.0004	0.0006
PCB-209 (2,2',3,3',4,4',5,5')	3/47	Not Tested	0.0001	0.007	0.0002	0.0003	0.0004	0.0006	0.0003	0.0003
PCB-28 (2,4,4')	4/47	Lognormal	0.0001	0.007	0.0002	0.002	0.0004	0.0006	0.0004	0.0006
PCB-44 (2,2',3,5')	8/47	Lognormal	0.0001	0.007	0.0002	0.002	0.0004	0.0007	0.0004	0.0007
PCB-52 (2,2',5,5')	16/47	Lognormal	0.0001	0.007	0.00008	0.002	0.0005	0.0008	0.0005	0.0008
PCB-66 (2,3',4,4')	5/47	Lognormal	0.0001	0.007	0.0002	0.001	0.0004	0.0006	0.0004	0.0006
PCB-77 (3,3',4,4')	2/47	Not Tested	0.0001	0.007	0.0003	0.0009	0.0004	0.0006	0.0004	0.0006
PCB-8 (2,4')	6/47	Lognormal	0.0001	0.007	0.0002	0.006	0.0005	0.0008	0.0005	0.0008
Trans-Nonachlor	33/47	Lognormal	0.0001	0.001	0.0002	0.07	0.003	0.008	0.003	0.008
Explosive										
1,3-Dinitrobenzene	1/7	Not Tested	0.12	0.12	0.1	0.1	0.07	0.09	0.07	0.09
HMX	2/7	Not Tested	0.12	0.12	0.4	0.4	0.07	0.08	0.07	0.08
Dioxin/Furan										
2,3,7,8-TCDD TEQ	9/11	Lognormal	0.000007	0.000014	0.000001	0.000343	0.000063	0.0005	0.000063	0.000343

TABLE M-11

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SURFACE WATER ANALYSES
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/l)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Metal										
Aluminum	21/24	Lognormal	0.123	0.141	0.17	2.1	0.75	1.3	0.75	1.3
Antimony	2/24	Not Tested	0.0016	0.003	0.0026	0.0036	0.0013	0.0015	0.0013	0.0015
Arsenic	9/24	Lognormal	0.0028	0.0067	0.0021	0.012	0.0025	0.0030	0.0025	0.0030
Barium	24/24	Lognormal	NL	NL	0.026	0.17	0.070	0.085	0.070	0.085
Cadmium	5/24	Lognormal	0.0002	0.0014	0.00044	0.0025	0.00027	0.00042	0.00027	0.00042
Calcium	24/24	Lognormal	NL	NL	19.4	108	49.5	57.1	49.5	57.1
Chromium	14/24	Lognormal	0.0005	0.0024	0.00063	0.0061	0.0022	0.0033	0.0022	0.0033
Cobalt	12/24	Lognormal	0.0005	0.0014	0.00052	0.0014	0.00067	0.00081	0.00067	0.00081
Copper	18/24	Normal	0.003	0.0062	0.0030	0.014	0.0059	0.0070	0.0059	0.0070
Iron	24/24	Lognormal	NL	NL	0.40	3.3	1.6	2.0	1.6	2.0
Lead	5/24	Lognormal	0.0008	0.0025	0.0013	0.0037	0.0011	0.0014	0.0011	0.0014
Magnesium	24/24	Lognormal	NL	NL	33.7	268	107	129	107	129
Manganese	24/24	Lognormal	NL	NL	0.045	2.0	0.23	0.34	0.23	0.34
Mercury	2/24	Not Tested	0.0001	0.0002	0.00020	0.00024	0.000073	0.000090	0.000070	0.000090
Molybdenum	6/24	Lognormal	0.00076	0.0037	0.0013	0.0073	0.0012	0.0017	0.0012	0.0017
Nickel	17/24	Lognormal	0.0033	0.004	0.0026	0.0076	0.0042	0.0053	0.0042	0.0053
Potassium	24/24	Normal	NL	NL	10.7	73.3	33.3	38.3	33.3	38.3
Sodium	24/24	Lognormal	NL	NL	252	2,200	858	1,040	858	1,040
Thallium	2/24	Not Tested	0.0019	0.0047	0.0024	0.0024	0.0013	0.0015	0.0013	0.0015
Vanadium	14/24	Lognormal	0.0017	0.0041	0.0051	0.011	0.0053	0.0083	0.0053	0.0083
Zinc	13/24	Lognormal	0.0067	0.0742	0.013	0.33	0.059	0.12	0.059	0.12

TABLE M-11 (Continued)

SITE 11 - WOOD HOGGER
STATISTICAL SUMMARY OF SURFACE WATER ANALYSES
NAVAL WEAPONS STATION CONCORD

Chemical of Potential Concern	Detection Frequency	Type of Distribution	Concentration (mg/l)							
			Miminum SQL	Maximum SQL	Minimum Detected	Maximum Detected	Mean[a]	UCL_{95}[b]	CTE[c]	RME[d]
Volatile Organic Compound										
Xylene (total)	1/24	Not Tested	0.01	0.01	0.008	0.008	0.005	0.005	0.005	0.005

Notes

a The value presented is the arithmetic mean, calculated using distribution-dependent formulas. Substitute values of one-half the SQL are used for all analytical results reported as not detected.

b The value presented is the UCL_{95}, calculated using distribution-dependent formulas. Substitute values of one-half the SQL are used for all analytical results reported as not detected.

c The value presented is the lesser of the maximum detected concentration and the arithmetic mean.

d The value presented is the lesser of the maximum detected concentration and the UCL_{95}.

COPC Chemical of potential concern
CTE Central tendency exposure
mg/kg Milligrams per kilogram
NL Not listed (the analyte was detected in all samples)
RME Reasonable maximum exposure
SQL Sample quantitation limit
UCL_{95} 95 percent upper confidence limit on the arithmetic mean

TABLES M-12 TO M-51

HUMAN HEALTH RISK ASSESSMENT CHEMICAL-SPECIFIC RISK AND HAZARD ESTIMATES

TABLE M-12
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Antimony	3.1	2.5	--	750	--	--	< 0.01	< 0.01
Arsenic	57.6	33.8	3	480	1.9E-05	1.1E-05	0.12	0.07
Beryllium	0.51	0.22	--	3,700	--	--	< 0.01	< 0.01
Cadmium	5.8	2.6	3,000	930	1.9E-09	8.7E-10	< 0.01	< 0.01
Chromium	82.7	67.0	450	--	1.8E-07	1.5E-07	--	--
Copper	264	193	--	70,000	--	--	< 0.01	< 0.01
Mercury	0.48	0.40	--	560	--	--	< 0.01	< 0.01
Nickel	131	88.9	--	37,000	--	--	< 0.01	< 0.01
Silver	1.2	0.55	--	9,400	--	--	< 0.01	< 0.01
Vanadium	108	85.2	--	13,000	--	--	< 0.01	< 0.01
Zinc	743	547	--	560,000	--	--	< 0.01	< 0.01
Semivolatile Organic Compound								
2,6-Dimethylnaphthalene	0.03	0.03	--	190	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.07	0.07	3.6	--	1.9E-08	1.9E-08	--	--
Benzo(a)pyrene	0.07	0.07	0.36	--	1.9E-07	1.9E-07	--	--
Benzo(b)fluoranthene	0.09	0.09	3.6	--	2.5E-08	2.5E-08	--	--
Benzo(e)pyrene	0.05	0.05	--	26,000	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.07	0.07	--	26,000	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.08	0.08	36	--	2.2E-09	2.2E-09	--	--
Benzoic acid	0.1	0.1	--	4,300,000	--	--	< 0.01	< 0.01
Butylbenzylphthalate	0.05	0.05	--	210,000	--	--	< 0.01	< 0.01
Chrysene	0.1	0.1	360	--	2.8E-10	2.8E-10	--	--
Fluoranthene	0.2	0.1	--	37,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.05	0.05	3.6	--	1.4E-08	1.4E-08	--	--
Perylene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
Phenanthrene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
Pyrene	0.3	0.3	--	26,000	--	--	< 0.01	< 0.01

TABLE M-12
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.01	0.01	19	--	5.3E-10	5.3E-10	--	--
2,4'-DDE	0.0009	0.0006	13	--	6.9E-11	4.6E-11	--	--
2,4'-DDT	0.001	0.0005	13	800	7.7E-11	3.8E-11	< 0.01	< 0.01
4,4'-DDD	0.03	0.03	19	--	1.6E-09	1.6E-09	--	--
4,4'-DDE	0.006	0.004	13	--	4.6E-10	3.1E-10	--	--
4,4'-DDT	0.002	0.001	13	340	1.5E-10	7.7E-11	< 0.01	< 0.01
Aldrin	0.002	0.001	0.18	32	1.1E-08	5.6E-09	< 0.01	< 0.01
Alpha-chlordane	0.005	0.004	12	750	4.2E-10	3.3E-10	< 0.01	< 0.01
Dieldrin	0.002	0.001	0.19	53	1.1E-08	5.3E-09	< 0.01	< 0.01
Heptachlor	0.0006	0.0004	0.67	530	9.0E-10	6.0E-10	< 0.01	< 0.01
Hexachlorobenzene	0.002	0.001	1.9	860	1.1E-09	5.3E-10	< 0.01	< 0.01
Mirex	0.0005	0.0004	1.7	210	2.9E-10	2.4E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.002	0.001	1.3	--	1.5E-09	7.7E-10	--	--
PCB-105(2,3,3',4,4')	0.002	0.001	1.3	--	1.5E-09	7.7E-10	--	--
PCB-118(2,3',4,4',5)	0.004	0.004	1.3	--	3.1E-09	3.1E-09	--	--
PCB-128(2,2',3,3',4,4')	0.0008	0.0006	1.3	--	6.2E-10	4.6E-10	--	--
PCB-138(2,2',3,4,4',5')	0.003	0.002	1.3	--	2.3E-09	1.5E-09	--	--
PCB-153(2,2',4,4',5,5')	0.002	0.002	1.3	--	1.5E-09	1.5E-09	--	--
PCB-170(2,2',3,3',4,4',5)	0.0005	0.0003	1.3	--	3.8E-10	2.3E-10	--	--
PCB-18(2,2',5)	0.002	0.001	1.3	--	1.5E-09	7.7E-10	--	--
PCB-180(2,2',3,4,4',5,5')	0.002	0.001	1.3	--	1.5E-09	7.7E-10	--	--
PCB-187(2,2',3,4',5,5',6)	0.0007	0.0005	1.3	--	5.4E-10	3.8E-10	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.0007	0.0004	1.3	--	5.4E-10	3.1E-10	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0005	0.0004	1.3	--	3.8E-10	3.1E-10	--	--
PCB-28(2,4,4')	0.002	0.001	1.3	--	1.5E-09	7.7E-10	--	--
PCB-44(2,2',3,5')	0.003	0.001	1.3	--	2.3E-09	7.7E-10	--	--
PCB-52(2,2',5,5')	0.002	0.002	1.3	--	1.5E-09	1.5E-09	--	--

TABLE M-12
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-66(2,3',4,4')	0.004	0.002	1.3	--	3.1E-09	1.5E-09	--	--
PCB-77(3,3',4,4')	0.001	0.0008	1.3	--	7.7E-10	6.2E-10	--	--
Trans-nonachlor	0.004	0.003	12	750	3.3E-10	2.5E-10	< 0.01	< 0.01
				TOTAL:	**2.0E-05**	**1.2E-05**	**0.12**	**0.07**

TABLE M-13
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	29,400	21,100	--	1,900,000	--	--	0.02	0.01
Antimony	3.1	1.7	--	750	--	--	< 0.01	< 0.01
Arsenic	57.6	19.2	3	480	1.9E-05	6.4E-06	0.12	0.04
Beryllium	0.56	0.13	--	3,700	--	--	< 0.01	< 0.01
Cadmium	5.8	1.6	3,000	930	1.9E-09	5.3E-10	< 0.01	< 0.01
Chromium	92.5	62.8	450	--	2.1E-07	1.4E-07	--	--
Copper	264	61.5	--	70,000	--	--	< 0.01	< 0.01
Mercury	0.48	0.15	--	560	--	--	< 0.01	< 0.01
Nickel	131	83.4	--	37,000	--	--	< 0.01	< 0.01
Silver	1.2	0.32	--	9,400	--	--	< 0.01	< 0.01
Thallium	2.2	0.91	--	130	--	--	0.02	< 0.01
Vanadium	108	76.4	--	13,000	--	--	< 0.01	< 0.01
Zinc	743	192	--	560,000	--	--	< 0.01	< 0.01
Volatile Organic Compound								
Acetone	0.6	0.3	--	6,100	--	--	< 0.01	< 0.01
2-Butanone	0.4	0.1	--	27,000	--	--	< 0.01	< 0.01
Carbon disulfide	0.1	0.06	--	1,200	--	--	< 0.01	< 0.01
Chloromethane	0.05	0.03	2.6	--	1.9E-08	1.2E-08	--	--
Semivolatile Organic Compound								
2,6-Dimethylnaphthalene	0.03	0.03	--	190	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.07	0.07	3.6	--	1.9E-08	1.9E-08	--	--
Benzo(a)pyrene	0.07	0.07	0.36	--	1.9E-07	1.9E-07	--	--
Benzo(b)fluoranthene	0.09	0.09	3.6	--	2.5E-08	2.5E-08	--	--
Benzo(e)pyrene	0.05	0.05	--	26,000	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.07	0.07	--	26,000	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.08	0.08	36	--	2.2E-09	2.2E-09	--	--
Benzoic acid	1	1	--	4,300,000	--	--	< 0.01	< 0.01
Butylbenzylphthalate	0.05	0.05	--	210,000	--	--	< 0.01	< 0.01

TABLE M-13
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Chrysene	0.1	0.1	360	--	2.8E-10	2.8E-10	--	--
Fluoranthene	0.2	0.2	--	37,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.05	0.05	3.6	--	1.4E-08	1.4E-08	--	--
Perylene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
Phenanthrene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
Phenol	11	4	--	640,000	--	--	< 0.01	< 0.01
Pyrene	1	0.6	--	26,000	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.01	0.01	19	--	5.3E-10	5.3E-10	--	--
2,4'-DDE	0.0009	0.0005	13	--	6.9E-11	3.8E-11	--	--
2,4'-DDT	0.001	0.0005	13	800	7.7E-11	3.8E-11	< 0.01	< 0.01
4,4'-DDD	0.03	0.02	19	--	1.6E-09	1.1E-09	--	--
4,4'-DDE	0.006	0.005	13	--	4.6E-10	3.8E-10	--	--
4,4'-DDT	0.002	0.002	13	800	1.5E-10	1.5E-10	< 0.01	< 0.01
Aldrin	0.002	0.002	0.18	32	1.1E-08	1.1E-08	< 0.01	< 0.01
Alpha-chlordane	0.005	0.003	12	750	4.2E-10	2.5E-10	< 0.01	< 0.01
Dieldrin	0.002	0.002	0.19	53	1.1E-08	1.1E-08	< 0.01	< 0.01
Heptachlor	0.0008	0.0008	0.67	530	1.2E-09	1.2E-09	< 0.01	< 0.01
Hexachlorobenzene	0.002	0.0009	1.9	860	1.1E-09	4.7E-10	< 0.01	< 0.01
Mirex	0.0005	0.0004	1.7	210	2.9E-10	2.4E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.002	0.001	1.3	--	1.5E-09	7.7E-10	--	--
PCB-105(2,3,3',4,4')	0.002	0.002	1.3	--	1.5E-09	1.5E-09	--	--
PCB-118(2,3',4,4',5)	0.004	0.004	1.3	--	3.1E-09	3.1E-09	--	--
PCB-128(2,2',3,3',4,4')	0.0008	0.0005	1.3	--	6.2E-10	3.8E-10	--	--
PCB-138(2,2',3,4,4',5')	0.003	0.002	1.3	--	2.3E-09	1.5E-09	--	--
PCB-153(2,2',4,4',5,5')	0.002	0.001	1.3	--	1.5E-09	7.7E-10	--	--
PCB-170(2,2',3,3',4,4',5)	0.0005	0.0003	1.3	--	3.8E-10	2.3E-10	--	--
PCB-18(2,2',5)	0.002	0.002	1.3	--	1.5E-09	1.5E-09	--	--
PCB-180(2,2',3,4,4',5,5')	0.002	0.001	1.3	--	1.5E-09	7.7E-10	--	--

TABLE M-13
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-187(2,2',3,4',5,5',6)	0.0007	0.0005	1.3	--	5.4E-10	3.8E-10	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.0007	0.0004	1.3	--	5.4E-10	3.1E-10	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0005	0.0004	1.3	--	3.8E-10	3.1E-10	--	--
PCB-28(2,4,4')	0.002	0.0009	1.3	--	1.5E-09	6.9E-10	--	--
PCB-44(2,2',3,5')	0.003	0.001	1.3	--	2.3E-09	7.7E-10	--	--
PCB-52(2,2',5,5')	0.002	0.002	1.3	--	1.5E-09	1.5E-09	--	--
PCB-66(2,3',4,4')	0.004	0.002	1.3	--	3.1E-09	1.5E-09	--	--
PCB-77(3,3',4,4')	0.001	0.0007	1.3	--	7.7E-10	5.4E-10	--	--
Trans-nonachlor	0.004	0.004	12	750	3.3E-10	3.3E-10	< 0.01	< 0.01
				TOTAL:	**2.0E-05**	**6.8E-06**	**0.15**	**0.05**

TABLE M-14
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Antimony	3.1	2.5	--	30	--	--	0.10	0.08
Arsenic	57.6	33.8	0.38	21	1.5E-04	8.9E-05	2.74	1.61
Beryllium	0.51	0.22	--	150	--	--	< 0.01	< 0.01
Cadmium	5.8	2.6	9	37	6.4E-07	2.9E-07	0.16	0.07
Chromium	82.7	67.0	210	--	3.9E-07	3.2E-07	--	--
Copper	264	193	--	2,800	--	--	0.09	0.07
Mercury	0.48	0.40	--	22	--	--	0.02	0.02
Nickel	131	88.9	150	1,500	8.7E-07	5.9E-07	0.09	0.06
Silver	1.2	0.55	--	370	--	--	< 0.01	< 0.01
Vanadium	108	85.2	--	520	--	--	0.21	0.16
Zinc	743	547	--	22,000	--	--	0.03	0.02
Semivolatile Organic Compound								
2,6-Dimethylnaphthalene	0.03	0.03	--	55	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.07	0.07	0.56	--	1.3E-07	1.3E-07	--	--
Benzo(a)pyrene	0.07	0.07	0.056	--	1.3E-06	1.3E-06	--	--
Benzo(b)fluoranthene	0.09	0.09	0.56	--	1.6E-07	1.6E-07	--	--
Benzo(e)pyrene	0.05	0.05	--	1,500	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.07	0.07	--	1,500	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.08	0.08	0.61	--	1.3E-07	1.3E-07	--	--
Benzoic acid	0.1	0.1	--	220,000	--	--	< 0.01	< 0.01
Butylbenzylphthalate	0.05	0.05	--	11,000	--	--	< 0.01	< 0.01
Chrysene	0.1	0.1	6.1	--	1.6E-08	1.6E-08	--	--
Fluoranthene	0.2	0.1	--	2,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.05	0.05	0.56	--	8.9E-08	8.9E-08	--	--
Perylene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
Phenanthrene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
Pyrene	0.3	0.3	--	1,500	--	--	< 0.01	< 0.01

TABLE M-14
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.01	0.01	2.4	--	4.2E-09	4.2E-09	--	--
2,4'-DDE	0.0009	0.0006	1.7	--	5.3E-10	3.5E-10	--	--
2,4'-DDT	0.001	0.0005	1.7	35	5.9E-10	2.9E-10	< 0.01	< 0.01
4,4'-DDD	0.03	0.03	2.4	--	1.3E-08	1.3E-08	--	--
4,4'-DDE	0.006	0.004	1.7	--	3.5E-09	2.4E-09	--	--
4,4'-DDT	0.002	0.001	1.7	35	1.2E-09	5.9E-10	< 0.01	< 0.01
Aldrin	0.002	0.001	0.026	1.6	7.7E-08	3.8E-08	< 0.01	< 0.01
Alpha-chlordane	0.005	0.004	1.6	33	3.1E-09	2.5E-09	< 0.01	< 0.01
Dieldrin	0.002	0.001	0.028	2.7	7.1E-08	3.6E-08	< 0.01	< 0.01
Heptachlor	0.0006	0.0004	0.099	27	6.1E-09	4.0E-09	< 0.01	< 0.01
Hexachlorobenzene	0.002	0.001	0.28	44	7.1E-09	3.6E-09	< 0.01	< 0.01
Mirex	0.0005	0.0004	0.25	11	2.0E-09	1.6E-09	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.002	0.001	0.20	--	1.0E-08	5.0E-09	--	--
PCB-105(2,3,3',4,4')	0.002	0.001	0.20	--	1.0E-08	5.0E-09	--	--
PCB-118(2,3',4,4',5)	0.004	0.004	0.20	--	2.0E-08	2.0E-08	--	--
PCB-128(2,2',3,3',4,4')	0.0008	0.0006	0.20	--	4.0E-09	3.0E-09	--	--
PCB-138(2,2',3,4,4',5')	0.003	0.002	0.20	--	1.5E-08	1.0E-08	--	--
PCB-153(2,2',4,4',5,5')	0.002	0.002	0.20	--	1.0E-08	1.0E-08	--	--
PCB-170(2,2',3,3',4,4',5)	0.0005	0.0003	0.20	--	2.5E-09	1.5E-09	--	--
PCB-18(2,2',5)	0.002	0.001	0.20	--	1.0E-08	5.0E-09	--	--
PCB-180(2,2',3,4,4',5,5')	0.002	0.001	0.20	--	1.0E-08	5.0E-09	--	--
PCB-187(2,2',3,4',5,5',6)	0.0007	0.0005	0.20	--	3.5E-09	2.5E-09	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.0007	0.0004	0.20	--	3.5E-09	2.0E-09	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0005	0.0004	0.20	--	2.5E-09	2.0E-09	--	--
PCB-28(2,4,4')	0.002	0.001	0.20	--	1.0E-08	5.0E-09	--	--
PCB-44(2,2',3,5')	0.003	0.001	0.20	--	1.5E-08	5.0E-09	--	--
PCB-52(2,2',5,5')	0.002	0.002	0.20	--	1.0E-08	1.0E-08	--	--

TABLE M-14
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-66(2,3',4,4')	0.004	0.002	0.20	--	2.0E-08	1.0E-08	--	--
PCB-77(3,3',4,4')	0.001	0.0008	0.20	--	5.0E-09	4.0E-09	--	--
Trans-nonachlor	0.004	0.003	1.6	33	2.5E-09	1.9E-09	< 0.01	< 0.01
				TOTAL:	**1.6E-04**	**9.2E-05**	**3.45**	**2.10**

TABLE M-15
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	29,400	21,100	--	75,000	--	--	0.39	0.28
Antimony	3.1	1.7	--	30	--	--	0.10	0.06
Arsenic	57.6	19.2	0.38	21	1.5E-04	5.1E-05	2.74	0.91
Beryllium	0.56	0.13	--	150	--	--	< 0.01	< 0.01
Cadmium	5.8	1.6	9	37	6.4E-07	1.8E-07	0.16	0.04
Chromium	92.5	62.8	210	--	4.4E-07	3.0E-07	--	--
Copper	264	61.5	--	2,800	--	--	0.09	0.02
Mercury	0.48	0.15	--	22	--	--	0.02	< 0.01
Nickel	131	83.4	150	1,500	8.7E-07	5.6E-07	0.09	0.06
Silver	1.2	0.32	--	370	--	--	< 0.01	< 0.01
Thallium	2.2	0.91	--	5.2	--	--	0.42	0.18
Vanadium	108	76.4	--	520	--	--	0.21	0.15
Zinc	743	192	--	22,000	--	--	0.03	< 0.01
Volatile Organic Compound								
Acetone	0.6	0.3	--	1,400	--	--	< 0.01	< 0.01
2-Butanone	0.4	0.1	--	6,900	--	--	< 0.01	< 0.01
Carbon disulfide	0.1	0.06	--	350	--	--	< 0.01	< 0.01
Chloromethane	0.05	0.03	1.2	--	4.2E-08	2.5E-08	--	--
Semivolatile Organic Compound								
2,6-Dimethylnaphthalene	0.03	0.03	--	55	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.07	0.07	0.56	--	1.3E-07	1.3E-07	--	--
Benzo(a)pyrene	0.07	0.07	0.056	--	1.3E-06	1.3E-06	--	--
Benzo(b)fluoranthene	0.09	0.09	0.56	--	1.6E-07	1.6E-07	--	--
Benzo(e)pyrene	0.05	0.05	--	1,500	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.07	0.07	--	1,500	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.08	0.08	0.61	--	1.3E-07	1.3E-07	--	--
Benzoic acid	1	1	--	220,000	--	--	< 0.01	< 0.01
Butylbenzylphthalate	0.05	0.05	--	11,000	--	--	< 0.01	< 0.01

TABLE M-15
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Chrysene	0.1	0.1	6.1	--	1.6E-08	1.6E-08	--	--
Fluoranthene	0.2	0.2	--	2,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.05	0.05	0.56	--	8.9E-08	8.9E-08	--	--
Perylene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
Phenanthrene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
Phenol	11	4	--	33,000	--	--	< 0.01	< 0.01
Pyrene	1	0.6	--	1,500	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.01	0.01	2.4	--	4.2E-09	4.2E-09	--	--
2,4'-DDE	0.0009	0.0005	1.7	--	5.3E-10	2.9E-10	--	--
2,4'-DDT	0.001	0.0005	1.7	35	5.9E-10	2.9E-10	< 0.01	< 0.01
4,4'-DDD	0.03	0.02	2.4	--	1.3E-08	8.3E-09	--	--
4,4'-DDE	0.006	0.005	1.7	--	3.5E-09	2.9E-09	--	--
4,4'-DDT	0.002	0.002	1.7	35	1.2E-09	1.2E-09	< 0.01	< 0.01
Aldrin	0.002	0.002	0.026	1.6	7.7E-08	7.7E-08	< 0.01	< 0.01
Alpha-chlordane	0.005	0.003	1.6	33	3.1E-09	1.9E-09	< 0.01	< 0.01
Dieldrin	0.002	0.002	0.028	2.7	7.1E-08	7.1E-08	< 0.01	< 0.01
Heptachlor	0.0008	0.0008	0.099	27	8.1E-09	8.1E-09	< 0.01	< 0.01
Hexachlorobenzene	0.002	0.0009	0.28	44	7.1E-09	3.2E-09	< 0.01	< 0.01
Mirex	0.0005	0.0004	0.25	11	2.0E-09	1.6E-09	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.002	0.001	0.2	--	1.0E-08	5.0E-09	--	--
PCB-105(2,3,3',4,4')	0.002	0.002	0.2	--	1.0E-08	1.0E-08	--	--
PCB-118(2,3',4,4',5)	0.004	0.004	0.2	--	2.0E-08	2.0E-08	--	--
PCB-128(2,2',3,3',4,4')	0.0008	0.0005	0.2	--	4.0E-09	2.5E-09	--	--
PCB-138(2,2',3,4,4',5')	0.003	0.002	0.2	--	1.5E-08	1.0E-08	--	--
PCB-153(2,2',4,4',5,5')	0.002	0.001	0.2	--	1.0E-08	5.0E-09	--	--
PCB-170(2,2',3,3',4,4',5)	0.0005	0.0003	0.2	--	2.5E-09	1.5E-09	--	--
PCB-18(2,2',5)	0.002	0.002	0.2	--	1.0E-08	1.0E-08	--	--
PCB-180(2,2',3,4,4',5,5')	0.002	0.001	0.2	--	1.0E-08	5.0E-09	--	--

TABLE M-15
SITE 1 - TIDAL AREA LANDFILL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-187(2,2',3,4',5,5',6)	0.0007	0.0005	0.2	--	3.5E-09	2.5E-09	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.0007	0.0004	0.2	--	3.5E-09	2.0E-09	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0005	0.0004	0.2	--	2.5E-09	2.0E-09	--	--
PCB-28(2,4,4')	0.002	0.0009	0.2	--	1.0E-08	4.5E-09	--	--
PCB-44(2,2',3,5')	0.003	0.001	0.2	--	1.5E-08	5.0E-09	--	--
PCB-52(2,2',5,5')	0.002	0.002	0.2	--	1.0E-08	1.0E-08	--	--
PCB-66(2,3',4,4')	0.004	0.002	0.2	--	2.0E-08	1.0E-08	--	--
PCB-77(3,3',4,4')	0.001	0.0007	0.2	--	5.0E-09	3.5E-09	--	--
Trans-nonachlor	0.004	0.004	1.6	33	2.5E-09	2.5E-09	< 0.01	< 0.01
				TOTAL:	**1.6E-04**	**5.4E-05**	**4.26**	**1.70**

TABLE M-16
SITE 1, TIDAL AREA LANDFILL
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Metal											
Aluminum			0.08					1.61			
Arsenic	1.61										< 0.01
Beryllium				0.07							
Cadmium					0.07						
Copper			0.02						0.06		
Mercury								< 0.01			
Nickel											0.16
Silver											
Vanadium		0.02									
Zinc											
Semivolatile Organic Compound											< 0.01
2,6-Dimethylnaphthalene											< 0.01
Benzo(e)pyrene											< 0.01
Benzo(g,h,i)perylene											< 0.01
Benzoic acid						< 0.01					
Butylbenzylphthalate		< 0.01		< 0.01		< 0.01					< 0.01
Fluoranthene											< 0.01
Perylene											
Phenanthrene				< 0.01							
Pyrene											
Pesticide/Polychlorinated Biphenyl						< 0.01					
2,4'-DDT						< 0.01					
4,4'-DDT						< 0.01					
Aldrin						< 0.01					
alpha-Chlordane						< 0.01					
Dieldrin						< 0.01					
Heptachlor											

TABLE M-16
SITE 1, TIDAL AREA LANDFILL
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Hexachlorobenzene						< 0.01					
Mirex						< 0.01					< 0.01
Trans-nonachlor						< 0.01					
Total	**1.61**	**0.02**	**0.1**	**0.07**	**0.07**	**< 0.01**	**--**	**1.61**	**0.06**	**--**	**0.16**

TABLE M-17
SITE 1, TIDAL AREA LANDFILL
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Metal											
Aluminum			0.28								0.06
Antimony		0.06						0.91			
Arsenic	0.91										< 0.01
Beryllium				0.04							
Cadmium					0.02						
Copper			< 0.01						0.06		
Mercury								< 0.01			
Nickel								0.18			0.18
Silver											0.15
Thallium											
Vanadium		< 0.01									
Zinc											
Volatile Organic Compound											
Acetone				< 0.01		< 0.01				< 0.01	
2-Butanone										< 0.01	
Carbon disulfide			< 0.01								
Semivolatile Organic Compound											< 0.01
2,6-Dimethylnaphthalene											< 0.01
Benzo(e)pyrene											< 0.01
Benzo(g,h,i)perylene											< 0.01
Benzoic acid						< 0.01					
Butylbenzylphthalate						< 0.01					
Fluoranthene		< 0.01		< 0.01							< 0.01
Perylene											< 0.01
Phenanthrene									< 0.01		
Phenol				< 0.01							
Pyrene											

TABLE M-17
SITE 1, TIDAL AREA LANDFILL
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Pesticide/Polychlorinated Biphenyl											
2,4'-DDT						< 0.01					
4,4'-DDT						< 0.01					
Aldrin						< 0.01					
alpha-Chlordane						< 0.01					
Dieldrin						< 0.01					
Heptachlor						< 0.01					
Hexachlorobenzene						< 0.01					
Mirex						< 0.01					< 0.01
Trans-nonachlor						< 0.01					
Total	**0.91**	**0.06**	**0.28**	**0.04**	**0.02**	**< 0.01**	**--**	**1.09**	**0.06**	**< 0.01**	**0.39**

TABLE M-18
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	33,700	19,300	--	1,900,000	--	--	0.02	0.01
Antimony	7.1	1.4	--	750	--	--	< 0.01	< 0.01
Arsenic	47.2	13.6	3	480	1.6E-05	4.5E-06	0.10	0.03
Barium	7,710	169	--	120,000	--	--	0.06	< 0.01
Beryllium	0.57	0.097	--	3,700	--	--	< 0.01	< 0.01
Chromium	319	61.9	450	--	7.1E-07	1.4E-07	--	--
Copper	272	49.2	--	70,000	--	--	< 0.01	< 0.01
Manganese	2,090	564	--	45,000	--	--	0.05	0.01
Mercury	0.92	0.24	--	560	--	--	< 0.01	< 0.01
Molybdenum	53.7	0.94	--	9,400	--	--	< 0.01	< 0.01
Nickel	146	75.7	--	37,000	--	--	< 0.01	< 0.01
Selenium	1.3	0.58	--	9,400	--	--	< 0.01	< 0.01
Silver	0.72	0.13	--	9,400	--	--	< 0.01	< 0.01
Thallium	2.4	0.40	--	130	--	--	0.02	< 0.01
Vanadium	130	70.4	--	13,000	--	--	0.01	< 0.01
Zinc	959	164	--	560,000	--	--	< 0.01	< 0.01
Semivolatile Organic Compound								
1-Methylphenanthrene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
2,4-Dimethylphenol	0.02	0.02	--	21,000	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.1	0.1	--	190	--	--	< 0.01	< 0.01
2-Methylnaphthalene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
4-Methylphenol	0.7	0.1	--	5,300	--	--	< 0.01	< 0.01
Acenaphthene	0.03	0.03	--	28,000	--	--	< 0.01	< 0.01
Anthracene	0.1	0.1	--	220,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.4	0.1	3.6	--	1.1E-07	2.8E-08	--	--
Benzo(a)pyrene	0.3	0.1	0.36	--	8.3E-07	2.8E-07	--	--
Benzo(b)fluoranthene	0.4	0.1	3.6	--	1.1E-07	2.8E-08	--	--
Benzo(e)pyrene	0.2	0.1	--	26,000	--	--	< 0.01	< 0.01

TABLE M-18
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPC'S IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Benzo(g,h,i)perylene	0.2	0.1	--	26,000	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.3	0.1	36	--	8.3E-09	2.8E-09	--	--
Benzoic acid	0.9	0.3	--	4,300,000	--	--	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	0.2	0.1	210	21,000	9.5E-10	4.8E-10	< 0.01	< 0.01
Carbazole	0.04	0.04	150	--	2.7E-10	2.7E-10	--	--
Chrysene	0.4	0.1	360	--	1.1E-09	2.8E-10	--	--
Dibenz(a,h)anthracene	0.09	0.09	0.36	--	2.5E-07	2.5E-07	--	--
Dibenzothiophene	0.02	0.02	--	--	--	--	--	--
Diethylphthalate	0.2	0.1	--	860,000	--	--	< 0.01	< 0.01
Fluoranthene	1	0.1	--	37,000	--	--	< 0.01	< 0.01
Fluorene	0.03	0.03	--	22,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.2	0.1	3.6	--	5.6E-08	2.8E-08	--	--
Isophorone	0.04	0.04	3,200	210,000	1.3E-11	1.3E-11	< 0.01	< 0.01
Naphthalene	0.2	0.1	--	190	--	--	< 0.01	< 0.01
Perylene	0.1	0.1	--	190	--	--	< 0.01	< 0.01
Phenanthrene	0.7	0.1	--	190	--	--	< 0.01	< 0.01
Pyrene	0.7	0.1	--	26,000	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.007	0.001	19	--	3.7E-10	5.3E-11	--	--
2,4'-DDE	0.001	0.0002	13	--	7.7E-11	1.5E-11	--	--
2,4'-DDT	0.005	0.0007	13	800	3.8E-10	5.4E-11	< 0.01	< 0.01
4,4'-DDD	0.03	0.004	19	--	1.6E-09	2.1E-10	--	--
4,4'-DDE	0.009	0.002	13	--	6.9E-10	1.5E-10	--	--
4,4'-DDT	0.03	0.004	13	800	2.3E-09	3.1E-10	< 0.01	< 0.01
Aldrin	0.0008	0.0002	0.18	32	4.4E-09	1.1E-09	< 0.01	< 0.01
Alpha-chlordane	0.003	0.0007	12	750	2.5E-10	5.8E-11	< 0.01	< 0.01
Dieldrin	0.002	0.0003	0.19	53	1.1E-08	1.6E-09	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.0009	0.0002	3.2	450	2.8E-10	6.3E-11	< 0.01	< 0.01
Heptachlor	0.0004	0.0001	0.67	530	6.0E-10	1.5E-10	< 0.01	< 0.01

TABLE M-18
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Heptachlor epoxide	0.001	0.0002	0.33	14	3.0E-09	6.1E-10	< 0.01	< 0.01
Hexachlorobenzene	0.002	0.0002	1.9	860	1.1E-09	1.1E-10	< 0.01	< 0.01
Mirex	0.001	0.0002	1.7	210	5.9E-10	1.2E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.001	0.0003	1.3	--	7.7E-10	2.3E-10	--	--
PCB-105(2,3,3',4,4')	0.001	0.0002	1.3	--	7.7E-10	1.5E-10	--	--
PCB-118(2,3',4,4',5)	0.001	0.0004	1.3	--	7.7E-10	3.1E-10	--	--
PCB-126(3,3',4,4',5)	0.004	0.0003	1.3	--	3.1E-09	2.3E-10	--	--
PCB-128(2,2',3,3',4,4')	0.0006	0.0001	1.3	--	4.6E-10	7.7E-11	--	--
PCB-138(2,2',3,4,4',5')	0.002	0.0005	1.3	--	1.5E-09	3.8E-10	--	--
PCB-153(2,2',4,4',5,5')	0.002	0.0004	1.3	--	1.5E-09	3.1E-10	--	--
PCB-170(2,2',3,3',4,4',5)	0.0009	0.0001	1.3	--	6.9E-10	7.7E-11	--	--
PCB-18(2,2',5)	0.0004	0.0001	1.3	--	3.1E-10	7.7E-11	--	--
PCB-180(2,2',3,4,4',5,5')	0.002	0.0003	1.3	--	1.5E-09	2.3E-10	--	--
PCB-187(2,2',3,4',5,5',6)	0.0008	0.0002	1.3	--	6.2E-10	1.5E-10	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.0004	0.0001	1.3	--	3.1E-10	7.7E-11	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.001	0.0002	1.3	--	7.7E-10	1.5E-10	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0004	0.0001	1.3	--	3.1E-10	7.7E-11	--	--
PCB-28(2,4,4')	0.0005	0.0001	1.3	--	3.8E-10	7.7E-11	--	--
PCB-44(2,2',3,5')	0.0003	0.0001	1.3	--	2.3E-10	7.7E-11	--	--
PCB-52(2,2',5,5')	0.001	0.0002	1.3	--	7.7E-10	1.5E-10	--	--
PCB-66(2,3',4,4')	0.001	0.0002	1.3	--	7.7E-10	1.5E-10	--	--
PCB-77(3,3',4,4')	0.001	0.0003	1.3	--	7.7E-10	2.3E-10	--	--
PCB-8(2,4')	0.004	0.0005	1.3	--	3.1E-09	3.8E-10	--	--
Trans-nonachlor	0.002	0.0007	12	750	1.7E-10	5.8E-11	< 0.01	< 0.01
				TOTAL:	**1.8E-05**	**5.3E-06**	**0.26**	**0.05**

TABLE M-19
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	33,700	19,100	--	1,900,000	--	--	0.02	0.01
Antimony	7.1	1.3	--	750	--	--	< 0.01	< 0.01
Arsenic	47.2	13.9	3	480	1.6E-05	4.6E-06	0.10	0.03
Barium	7,710	160	--	120,000	--	--	0.06	< 0.01
Beryllium	0.57	0.085	--	3,700	--	--	< 0.01	< 0.01
Chromium	319	61.4	450	--	7.1E-07	1.4E-07	--	--
Cobalt	108	17.1	--	29,000	--	--	< 0.01	< 0.01
Copper	272	47.4	--	70,000	--	--	< 0.01	< 0.01
Manganese	6,300	573	--	45,000	--	--	0.14	0.01
Mercury	0.92	0.22	--	560	--	--	< 0.01	< 0.01
Molybdenum	53.7	1.4	--	9,400	--	--	< 0.01	< 0.01
Nickel	242	74.5	--	37,000	--	--	< 0.01	< 0.01
Selenium	2.8	0.65	--	9,400	--	--	< 0.01	< 0.01
Silver	0.72	0.13	--	9,400	--	--	< 0.01	< 0.01
Thallium	5.4	0.44	--	130	--	--	0.04	< 0.01
Vanadium	130	39.9	--	13,000	--	--	0.01	< 0.01
Zinc	959	155	--	560,000	--	--	< 0.01	< 0.01
Volatile Organic Compound								
2-Butanone	0.07	0.03	--	27,000	--	--	< 0.01	< 0.01
Carbon Disulfide	0.2	0.03	--	1,200	--	--	< 0.01	< 0.01
Chloromethane	0.01	0.01	2.6	--	3.8E-09	3.8E-09	--	--
Semivolatile Organic Compound								
1-Methylphenanthrene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
2,4-Dimethylphenol	0.02	0.02	--	21,000	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.1	0.1	--	190	--	--	< 0.01	< 0.01
2-Methylnaphthalene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
4-Methylphenol	0.7	0.2	--	5,300	--	--	< 0.01	< 0.01
Acenaphthene	0.7	0.2	--	28,000	--	--	< 0.01	< 0.01

TABLE M-19
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Anthracene	1	0.2	--	220,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	2	0.2	3.6	--	5.6E-07	5.6E-08	--	--
Benzo(a)pyrene	2	0.2	0.36	--	5.6E-06	5.6E-07	--	--
Benzo(b)fluoranthene	2	0.2	3.6	--	5.6E-07	5.6E-08	--	--
Benzo(e)pyrene	0.2	0.1	--	26,000	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.5	0.2	--	26,000	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.8	0.2	36	--	2.2E-08	5.6E-09	--	--
Benzoic Acid	0.9	0.3	--	4,300,000	--	--	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	0.2	0.2	210	21,000	9.5E-10	9.5E-10	< 0.01	< 0.01
Carbazole	1	0.2	150	--	6.7E-09	1.3E-09	--	--
Chrysene	2	0.2	360	--	5.6E-09	5.6E-10	--	--
Dibenz(a,h)anthracene	0.09	0.09	0.36	--	2.5E-07	2.5E-07	--	--
Dibenzofuran	0.5	0.2	--	3,200	--	--	< 0.01	< 0.01
Dibenzothiophene	0.02	0.02	--	--	--	--	--	--
Diethylphthalate	0.2	0.2	--	860,000	--	--	< 0.01	< 0.01
Fluoranthene	5	0.3	--	37,000	--	--	< 0.01	< 0.01
Fluorene	0.6	0.2	--	22,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.5	0.2	3.6	--	1.4E-07	5.6E-08	--	--
Isophorone	0.04	0.04	3,200	210,000	1.3E-11	1.3E-11	< 0.01	< 0.01
Naphthalene	0.3	0.2	--	190	--	--	< 0.01	< 0.01
Perylene	0.1	0.1	--	190	--	--	< 0.01	< 0.01
Phenanthrene	6	0.3	--	190	--	--	0.03	< 0.01
Phenol	0.6	0.2	--	640,000	--	--	< 0.01	< 0.01
Pyrene	4	0.3	--	26,000	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.007	0.001	19	--	3.7E-10	5.3E-11	--	--
2,4'-DDE	0.001	0.0002	13	--	7.7E-11	1.5E-11	--	--
2,4'-DDT	0.005	0.0007	13	800	3.8E-10	5.4E-11	< 0.01	< 0.01
4,4'-DDD	0.03	0.006	19	--	1.6E-09	3.2E-10	--	--

TABLE M-19
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
4,4'-DDE	0.009	0.004	13	--	6.9E-10	3.1E-10	--	--
4,4'-DDT	0.03	0.005	13	800	2.3E-09	3.8E-10	< 0.01	< 0.01
Aldrin	0.0008	0.0008	0.18	32	4.4E-09	4.4E-09	< 0.01	< 0.01
Alpha-chlordane	0.003	0.001	12	750	2.5E-10	8.3E-11	< 0.01	< 0.01
Dieldrin	0.002	0.002	0.19	53	1.1E-08	1.1E-08	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.0009	0.0008	3.2	450	2.8E-10	2.5E-10	< 0.01	< 0.01
Heptachlor	0.0004	0.0004	0.67	530	6.0E-10	6.0E-10	< 0.01	< 0.01
Heptachlor epoxide	0.001	0.0007	0.33	14	3.0E-09	2.1E-09	< 0.01	< 0.01
Hexachlorobenzene	0.002	0.0002	1.9	860	1.1E-09	1.1E-10	< 0.01	< 0.01
Mirex	0.001	0.0002	1.7	210	5.9E-10	1.2E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.001	0.0003	1.3	--	7.7E-10	2.3E-10	--	--
PCB-105(2,3,3',4,4')	0.001	0.0002	1.3	--	7.7E-10	1.5E-10	--	--
PCB-118(2,3',4,4',5)	0.001	0.0004	1.3	--	7.7E-10	3.1E-10	--	--
PCB-126(3,3',4,4',5)	0.004	0.0003	1.3	--	3.1E-09	2.3E-10	--	--
PCB-128(2,2',3,3',4,4')	0.0006	0.0001	1.3	--	4.6E-10	7.7E-11	--	--
PCB-138(2,2',3,4,4',5')	0.002	0.0005	1.3	--	1.5E-09	3.8E-10	--	--
PCB-153(2,2',4,4',5,5')	0.002	0.0004	1.3	--	1.5E-09	3.1E-10	--	--
PCB-170(2,2',3,3',4,4',5)	0.0009	0.0001	1.3	--	6.9E-10	7.7E-11	--	--
PCB-18(2,2',5)	0.0004	0.0001	1.3	--	3.1E-10	7.7E-11	--	--
PCB-180(2,2',3,4,4',5,5')	0.002	0.0003	1.3	--	1.5E-09	2.3E-10	--	--
PCB-187(2,2',3,4',5,5',6)	0.0008	0.0002	1.3	--	6.2E-10	1.5E-10	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.0004	0.0001	1.3	--	3.1E-10	7.7E-11	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.001	0.0002	1.3	--	7.7E-10	1.5E-10	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0004	0.0001	1.3	--	3.1E-10	7.7E-11	--	--
PCB-28(2,4,4')	0.0005	0.0001	1.3	--	3.8E-10	7.7E-11	--	--
PCB-44(2,2',3,5')	0.0003	0.0001	1.3	--	2.3E-10	7.7E-11	--	--
PCB-52(2,2',5,5')	0.001	0.0002	1.3	--	7.7E-10	1.5E-10	--	--
PCB-66(2,3',4,4')	0.001	0.0002	1.3	--	7.7E-10	1.5E-10	--	--
PCB-77(3,3',4,4')	0.001	0.0003	1.3	--	7.7E-10	2.3E-10	--	--

TABLE M-19
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-8(2,4')	0.004	0.0005	1.3	--	3.1E-09	3.8E-10	--	--
Trans-nonachlor	0.002	0.0007	12	750	1.7E-10	5.8E-11	< 0.01	< 0.01
				TOTAL:	**2.4E-05**	**5.8E-06**	**0.40**	**0.05**

TABLE M-20
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOILS (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	33,700	19,300	--	75,000	--	--	0.45	0.26
Antimony	7.1	1.4	--	30	--	--	0.24	0.05
Arsenic	47.2	13.6	0.38	21	1.2E-04	3.6E-05	2.25	0.65
Barium	7,710	169	--	5,200	--	--	1.48	0.03
Beryllium	0.57	0.097	--	150	--	--	< 0.01	< 0.01
Chromium	319	61.9	210	--	1.5E-06	2.9E-07	--	--
Copper	272	49.2	--	2,800	--	--	0.10	0.02
Manganese	2,090	564	--	3,100	--	--	0.67	0.18
Mercury	0.92	0.24	--	22	--	--	0.04	0.01
Molybdenum	53.7	0.94	--	370	--	--	0.15	< 0.01
Nickel	146	75.7	150	1,500	9.7E-07	5.0E-07	0.10	0.05
Selenium	1.3	0.58	--	370	--	--	< 0.01	< 0.01
Silver	0.72	0.13	--	370	--	--	< 0.01	< 0.01
Thallium	2.4	0.40	--	5.2	--	--	0.46	0.08
Vanadium	130	70.4	--	520	--	--	0.25	0.14
Zinc	959	164	--	22,000	--	--	0.04	< 0.01
Semivolatile Organic Compound								
1-Methylphenanthrene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
2,4-Dimethylphenol	0.02	0.02	--	1,100	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.1	0.1	--	55	--	--	< 0.01	< 0.01
2-Methylnaphthalene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
4-Methylphenol	0.7	0.1	--	270	--	--	< 0.01	< 0.01
Acenaphthene	0.03	0.03	--	2,600	--	--	< 0.01	< 0.01
Anthracene	0.1	0.1	--	14,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.4	0.1	0.56	--	7.1E-07	1.8E-07	--	--
Benzo(a)pyrene	0.3	0.1	0.056	--	5.4E-06	1.8E-06	--	--
Benzo(b)fluoranthene	0.4	0.1	0.56	--	7.1E-07	1.8E-07	--	--
Benzo(e)pyrene	0.2	0.1	--	1,500	--	--	< 0.01	< 0.01

TABLE M-20
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOILS (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Benzo(g,h,i)perylene	0.2	0.1	--	1,500	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.3	0.1	0.61	--	4.9E-07	1.6E-07	--	--
Benzoic acid	0.9	0.3	--	220,000	--	--	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	0.2	0.1	32	1,100	6.3E-09	3.1E-09	< 0.01	< 0.01
Carbazole	0.04	0.04	22	--	1.8E-09	1.8E-09	--	--
Chrysene	0.4	0.1	6.1	--	6.6E-08	1.6E-08	--	--
Dibenz(a,h)anthracene	0.09	0.09	0.056	--	1.6E-06	1.6E-06	--	--
Dibenzothiophene	0.02	0.02	--	--	--	--	--	--
Diethylphthalate	0.2	0.1	--	44,000	--	--	< 0.01	< 0.01
Fluoranthene	1	0.1	--	2,000	--	--	< 0.01	< 0.01
Fluorene	0.03	0.03	--	1,800	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.2	0.1	0.56	--	3.6E-07	1.8E-07	--	--
Isophorone	0.04	0.04	470	11,000	8.5E-11	8.5E-11	< 0.01	< 0.01
Naphthalene	0.2	0.1	--	55	--	--	< 0.01	< 0.01
Perylene	0.1	0.1	--	55	--	--	< 0.01	< 0.01
Phenanthrene	0.7	0.1	--	55	--	--	0.01	< 0.01
Pyrene	0.7	0.1	--	1,500	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.007	0.001	2.4	--	2.9E-09	4.2E-10	--	--
2,4'-DDE	0.001	0.0002	1.7	--	5.9E-10	1.2E-10	--	--
2,4'-DDT	0.005	0.0007	1.7	35	2.9E-09	4.1E-10	< 0.01	< 0.01
4,4'-DDD	0.03	0.004	2.4	--	1.3E-08	1.7E-09	--	--
4,4'-DDE	0.009	0.002	1.7	--	5.3E-09	1.2E-09	--	--
4,4'-DDT	0.03	0.004	1.7	35	1.8E-08	2.4E-09	< 0.01	< 0.01
Aldrin	0.0008	0.0002	0.026	1.6	3.1E-08	7.7E-09	< 0.01	< 0.01
Alpha-chlordane	0.003	0.0007	1.6	33	1.9E-09	4.4E-10	< 0.01	< 0.01
Dieldrin	0.002	0.0003	0.028	2.7	7.1E-08	1.1E-08	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.0009	0.0002	0.42	20	2.1E-09	4.8E-10	< 0.01	< 0.01
Heptachlor	0.0004	0.0001	0.099	27	4.0E-09	1.0E-09	< 0.01	< 0.01

TABLE M-20
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOILS (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Heptachlor epoxide	0.001	0.0002	0.049	0.71	2.0E-08	4.1E-09	< 0.01	< 0.01
Hexachlorobenzene	0.002	0.0002	0.28	44	7.1E-09	7.1E-10	< 0.01	< 0.01
Mirex	0.001	0.0002	0.25	11	4.0E-09	8.0E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.001	0.0003	0.2	--	5.0E-09	1.5E-09	--	--
PCB-105(2,3,3',4,4')	0.001	0.0002	0.2	--	5.0E-09	1.0E-09	--	--
PCB-118(2,3',4,4',5)	0.001	0.0004	0.2	--	5.0E-09	2.0E-09	--	--
PCB-126(3,3',4,4',5)	0.004	0.0003	0.2	--	2.0E-08	1.5E-09	--	--
PCB-128(2,2',3,3',4,4')	0.0006	0.0001	0.2	--	3.0E-09	5.0E-10	--	--
PCB-138(2,2',3,4,4',5')	0.002	0.0005	0.2	--	1.0E-08	2.5E-09	--	--
PCB-153(2,2',4,4',5,5')	0.002	0.0004	0.2	--	1.0E-08	2.0E-09	--	--
PCB-170(2,2',3,3',4,4',5)	0.0009	0.0001	0.2	--	4.5E-09	5.0E-10	--	--
PCB-18(2,2',5)	0.0004	0.0001	0.2	--	2.0E-09	5.0E-10	--	--
PCB-180(2,2',3,4,4',5,5')	0.002	0.0003	0.2	--	1.0E-08	1.5E-09	--	--
PCB-187(2,2',3,4',5,5',6)	0.0008	0.0002	0.2	--	4.0E-09	1.0E-09	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.0004	0.0001	0.2	--	2.0E-09	5.0E-10	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.001	0.0002	0.2	--	5.0E-09	1.0E-09	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6'	0.0004	0.0001	0.2	--	2.0E-09	5.0E-10	--	--
PCB-28(2,4,4')	0.0005	0.0001	0.2	--	2.5E-09	5.0E-10	--	--
PCB-44(2,2',3,5')	0.0003	0.0001	0.2	--	1.5E-09	5.0E-10	--	--
PCB-52(2,2',5,5')	0.001	0.0002	0.2	--	5.0E-09	1.0E-09	--	--
PCB-66(2,3',4,4')	0.001	0.0002	0.2	--	5.0E-09	1.0E-09	--	--
PCB-77(3,3',4,4')	0.001	0.0003	0.2	--	5.0E-09	1.5E-09	--	--
PCB-8(2,4')	0.004	0.0005	0.2	--	2.0E-08	2.5E-09	--	--
Trans-nonachlor	0.002	0.0007	1.6	33	1.3E-09	4.4E-10	< 0.01	< 0.01
				TOTAL:	1.4E-04	4.1E-05	6.24	1.46

TABLE M-21
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	33,700	19,100	--	75,000	--	--	0.45	0.25
Antimony	7.1	1.3	--	30	--	--	0.24	0.04
Arsenic	47.2	13.9	0.38	21	1.2E-04	3.7E-05	2.25	0.66
Barium	7,710	160	--	5,200	--	--	1.48	0.03
Beryllium	0.57	0.085	--	150	--	--	< 0.01	< 0.01
Chromium	319	61.4	210	--	1.5E-06	2.9E-07	--	--
Cobalt	108	17.1	--	3,300	--	--	0.03	< 0.01
Copper	272	47.4	--	2,800	--	--	0.10	0.02
Manganese	6,300	573	--	3,100	--	--	2.03	0.18
Mercury	0.92	0.22	--	22	--	--	0.04	0.01
Molybdenum	53.7	1.4	--	370	--	--	0.15	< 0.01
Nickel	242	74.5	150	1,500	1.6E-06	5.0E-07	0.16	0.05
Selenium	2.8	0.65	--	370	--	--	< 0.01	< 0.01
Silver	0.72	0.13	--	370	--	--	< 0.01	< 0.01
Thallium	5.4	0.44	--	5.2	--	--	1.04	0.08
Vanadium	130	69.9	--	520	--	--	0.25	0.13
Zinc	959	155	--	22,000	--	--	0.04	< 0.01
Volatile Organic Compound								
2-Butanone	0.07	0.03	--	6,900	--	--	< 0.01	< 0.01
Carbon disulfide	0.2	0.03	--	350	--	--	< 0.01	< 0.01
Chloromethane	0.01	0.01	1.2	--	8.3E-09	8.3E-09	--	--
Semivolatile Organic Compound								
1-Methylphenanthrene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
2,4-Dimethylphenol	0.02	0.02	--	1,100	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.1	0.1	--	55	--	--	< 0.01	< 0.01
2-Methylnaphthalene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
4-Methylphenol	0.7	0.2	--	270	--	--	< 0.01	< 0.01
Acenaphthene	0.7	0.2	--	2,600	--	--	< 0.01	< 0.01

TABLE M-21
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Anthracene	1	0.2	--	14,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	2	0.2	0.56	--	3.6E-06	3.6E-07	--	--
Benzo(a)pyrene	2	0.2	0.056	--	3.6E-05	3.6E-06	--	--
Benzo(b)fluoranthene	2	0.2	0.56	--	3.6E-06	3.6E-07	--	--
Benzo(e)pyrene	0.2	0.1	--	1,500	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.5	0.2	--	1,500	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.8	0.2	0.61	--	1.3E-06	3.3E-07	--	--
Benzoic acid	0.9	0.3	--	220,000	--	--	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	0.2	0.2	32	1,100	6.3E-09	6.3E-09	< 0.01	< 0.01
Carbazole	1	0.2	22	--	4.5E-08	9.1E-09	--	--
Chrysene	2	0.2	6.1	--	3.3E-07	3.3E-08	--	--
Dibenz(a,h)anthracene	0.09	0.09	0.056	--	1.6E-06	1.6E-06	--	--
Dibenzofuran	0.5	0.2	--	210	--	--	< 0.01	< 0.01
Dibenzothiophene	0.02	0.02	--	--	--	--	--	--
Diethylphthalate	0.2	0.2	--	44,000	--	--	< 0.01	< 0.01
Fluoranthene	5	0.3	--	2,000	--	--	< 0.01	< 0.01
Fluorene	0.6	0.2	--	1,800	--	--	< 0.01	< 0.01
Indeno(1.2,3-cd)pyrene	0.5	0.2	0.56	--	8.9E-07	3.6E-07	--	--
Isophorone	0.04	0.04	470	11,000	8.5E-11	8.5E-11	< 0.01	< 0.01
Naphthalene	0.3	0.2	--	55	--	--	< 0.01	< 0.01
Perylene	0.1	0.1	--	55	--	--	< 0.01	< 0.01
Phenanthrene	6	0.3	--	55	--	--	0.11	< 0.01
Phenol	0.6	0.2	--	33,000	--	--	< 0.01	< 0.01
Pyrene	4	0.3	--	1,500	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.007	0.001	2.4	--	2.9E-09	4.2E-10	--	--
2,4'-DDE	0.001	0.0002	1.7	--	5.9E-10	1.2E-10	--	--
2,4'-DDT	0.005	0.0007	1.7	35	2.9E-09	4.1E-10	< 0.01	< 0.01
4,4'-DDD	0.03	0.006	2.4	--	1.3E-08	2.5E-09	--	--

TABLE M-21
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
4,4'-DDE	0.009	0.004	1.7	--	5.3E-09	2.4E-09	--	--
4,4'-DDT	0.03	0.005	1.7	35	1.8E-08	2.9E-09	< 0.01	< 0.01
Aldrin	0.0008	0.0008	0.026	1.6	3.1E-08	3.1E-08	< 0.01	< 0.01
Alpha-chlordane	0.003	0.001	1.6	33	1.9E-09	6.3E-10	< 0.01	< 0.01
Dieldrin	0.002	0.002	0.028	2.7	7.1E-08	7.1E-08	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.0009	0.0008	0.42	20	2.1E-09	1.9E-09	< 0.01	< 0.01
Heptachlor	0.0004	0.0004	0.099	27	4.0E-09	4.0E-09	< 0.01	< 0.01
Heptachlor epoxide	0.001	0.0007	0.049	0.71	2.0E-08	1.4E-08	< 0.01	< 0.01
Hexachlorobenzene	0.002	0.0002	0.28	44	7.1E-09	7.1E-10	< 0.01	< 0.01
Mirex	0.001	0.0002	0.25	11	4.0E-09	8.0E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.001	0.0003	0.2	--	5.0E-09	1.5E-09	--	--
PCB-105(2,3,3',4,4')	0.001	0.0002	0.2	--	5.0E-09	1.0E-09	--	--
PCB-118(2,3',4,4',5)	0.001	0.0004	0.2	--	5.0E-09	2.0E-09	--	--
PCB-126(3,3',4,4',5)	0.004	0.0003	0.2	--	2.0E-08	1.5E-09	--	--
PCB-128(2,2',3,3',4,4')	0.0006	0.0001	0.2	--	3.0E-09	5.0E-10	--	--
PCB-138(2,2',3,4,4',5')	0.002	0.0005	0.2	--	1.0E-08	2.5E-09	--	--
PCB-153(2,2',4,4',5,5')	0.002	0.0004	0.2	--	1.0E-08	2.0E-09	--	--
PCB-170(2,2',3,3',4,4',5)	0.0009	0.0001	0.2	--	4.5E-09	5.0E-10	--	--
PCB-18(2,2',5)	0.0004	0.0001	0.2	--	2.0E-09	5.0E-10	--	--
PCB-180(2,2',3,4,4',5,5')	0.002	0.0003	0.2	--	1.0E-08	1.5E-09	--	--
PCB-187(2,2',3,4',5,5',6)	0.0008	0.0002	0.2	--	4.0E-09	1.0E-09	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.0004	0.0001	0.2	--	2.0E-09	5.0E-10	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.001	0.0002	0.2	--	5.0E-09	1.0E-09	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0004	0.0001	0.2	--	2.0E-09	5.0E-10	--	--
PCB-28(2,4,4')	0.0005	0.0001	0.2	--	2.5E-09	5.0E-10	--	--
PCB-44(2,2',3,5')	0.0003	0.0001	0.2	--	1.5E-09	5.0E-10	--	--
PCB-52(2,2',5,5')	0.001	0.0002	0.2	--	5.0E-09	1.0E-09	--	--
PCB-66(2,3',4,4')	0.001	0.0002	0.2	--	5.0E-09	1.0E-09	--	--
PCB-77(3,3',4,4')	0.001	0.0003	0.2	--	5.0E-09	1.5E-09	--	--

TABLE M-21
SITE 2 - R AREA DISPOSAL
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-8(2,4')	0.004	0.0005	0.2	--	2.0E-08	2.5E-09	--	--
Trans-nonachlor	0.002	0.0007	1.6	33	1.3E-09	4.4E-10	< 0.01	< 0.01
				TOTAL:	**1.7E-04**	**4.4E-05**	**8.37**	1.47

TABLE M-22
SITE 2, R AREA DISPOSAL
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Metal											
Aluminum			0.26								0.05
Antimony		0.05									
Arsenic	0.65							0.65			
Barium	0.03										< 0.01
Beryllium											
Copper					0.02						
Manganese			0.18								
Mercury			0.01								
Molybdenum				< 0.01					0.05		
Nickel											
Selenium			< 0.01			< 0.01		< 0.01			
Silver								< 0.01			0.08
Thallium								0.08			0.14
Vanadium											
Zinc		< 0.01									
Semivolatile Organic Compound											< 0.01
1-Methylphenanthrene											
2,4-Dimethylphenol		< 0.01	< 0.01								< 0.01
2,6-Dimethylnaphthalene											< 0.01
2-Methylnaphthalene											< 0.01
4-Methylphenol			< 0.01			< 0.01	< 0.01				
Acenaphthene						< 0.01					< 0.01
Anthracene											< 0.01
Benzo(e)pyrene											< 0.01
Benzo(g,h,i)perylene											< 0.01
Benzoic acid											
Bis(2-ethylhexyl)phthalate						< 0.01					
Diethylphthalate									< 0.01		< 0.01

TABLE M-22
SITE 2, R AREA DISPOSAL
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Fluoranthene		< 0.01		< 0.01		< 0.01					
Fluorene		< 0.01									
Isophorone											< 0.01
Naphthalene									< 0.01		
Perylene											< 0.01
Phenanthrene											< 0.01
Phenol									< 0.01		
Pyrene				< 0.01							
Pesticide/Polychlorinated Biphenyl											
2,4'-DDT						< 0.01					
4,4'-DDT						< 0.01					
Aldrin						< 0.01					
alpha-Chlordane						< 0.01					
Dieldrin						< 0.01					
gamma-BHC				< 0.01		< 0.01					
Heptachlor						< 0.01					
Heptachlor epoxide						< 0.01					
Hexachlorobenzene						< 0.01					
Mirex						< 0.01					< 0.01
Trans-nonachlor						< 0.01					
Total	**0.68**	**0.05**	**0.45**	**< 0.01**	**0.02**	**< 0.01**	**< 0.01**	**0.73**	**0.05**	**--**	**0.27**

TABLE M-23
SITE 2, R AREA DISPOSAL
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Metal											
Aluminum			0.25								
Antimony		0.04									0.04
Arsenic	0.66							0.66			
Barium	0.03										
Beryllium											< 0.01
Cobalt		< 0.01					< 0.01				
Copper					0.02						
Manganese			0.18								
Mercury			0.01								
Molybdenum				< 0.01							
Nickel									0.05		
Selenium			< 0.01			< 0.01		< 0.01			
Silver								< 0.01			
Thallium								0.08			0.08
Vanadium											0.13
Zinc		< 0.01									
Volatile Organic Compound											
2-Butanone										< 0.01	
Carbon disulfide			< 0.01							< 0.01	
Semivolatile Organic Compound											
1-Methylphenanthrene											< 0.01
2,4-Dimethylphenol		< 0.01	< 0.01								
2,6-Dimethylnaphthalene											< 0.01
2-Methylnaphthalene											< 0.01
4-Methylphenol			< 0.01			< 0.01	< 0.01				< 0.01
Acenaphthene						< 0.01					
Anthracene											< 0.01
Benzo(e)pyrene											< 0.01

TABLE M-23
SITE 2, R AREA DISPOSAL
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPC'S IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Benzo(g,h,i)perylene											< 0.01
Benzoic acid											< 0.01
Bis(2-ethylhexyl)phthalate						< 0.01					
Dibenzofuran											< 0.01
Diethylphthalate									< 0.01		< 0.01
Fluoranthene		< 0.01		< 0.01		< 0.01					
Fluorene		< 0.01									
Isophorone											< 0.01
Naphthalene									< 0.01		
Perylene											< 0.01
Phenanthrene											< 0.01
Phenol									< 0.01		
Pyrene				< 0.01							
Pesticide/Polychlorinated Biphenyl											
2,4'-DDT						< 0.01					
4,4'-DDT						< 0.01					
Aldrin						< 0.01					
alpha-Chlordane						< 0.01					
Dieldrin						< 0.01					
gamma-BHC				< 0.01		< 0.01					
Heptachlor						< 0.01					
Heptachlor epoxide						< 0.01					
Hexachlorobenzene						< 0.01					
Mirex						< 0.01					< 0.01
Trans-nonachlor						< 0.01					
Total	**0.69**	**0.04**	**0.44**	**< 0.01**	**0.02**	**< 0.01**	**< 0.01**	**0.74**	**0.05**	**< 0.01**	**0.25**

TABLE M-24
SITE 2 - R AREA DISPOSAL
CANCER RISKS FROM DERMAL CONTACT WITH SURFACE WATER
INDUSTRIAL WORKER
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

CANCER RISK = LADD x Slope Factor

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor $(mg/kg\text{-}day)^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Aluminum	1.9	37.7	1.0E-03	--	--	1.6E-05	--	3.1E-04	--
Arsenic	0.0063	0.024	1.0E-03	IRIS	1.5E+00	5.2E-08	7.8E-08	2.0E-07	3.0E-07
Iron	20.9	239	1.0E-03	--	--	1.7E-04	--	2.0E-03	--
Manganese	5.8	11.3	1.0E-03	--	--	4.8E-05	--	9.4E-05	--
Thallium	0.0020	0.0081	1.0E-03	--	--	1.7E-08	--	6.7E-08	--
Volatile Organic Compound									
Chloromethane	0.005	0.01	3.3E-03	HEAST	1.3E-02	1.4E-07	1.8E-09	2.7E-07	3.6E-09
Pesticide/Polychlorinated Biphenyl									
Aldrin	0.00003	0.00003	1.4E-03	IRIS	1.7E+01	3.5E-10	5.9E-09	3.5E-10	5.9E-09
Alpha-BHC	0.00003	0.00007	1.1E-02	IRIS	6.3E+00	2.7E-09	1.7E-08	6.4E-09	4.0E-08
Dieldrin	0.00003	0.00003	1.2E-02	IRIS	1.6E+01	3.0E-09	4.8E-08	3.0E-09	4.8E-08
Heptachlor	0.00003	0.0001	8.7E-03	IRIS	4.5E+00	2.2E-09	9.7E-09	7.2E-09	3.2E-08
Heptachlor epoxide	0.00001	0.00004	8.7E-03	IRIS	9.1E+00	7.2E-10	6.6E-09	2.9E-09	2.6E-08
Total							***1.7E-07***		***4.5E-07***

TABLE M-25
SITE 2 - R AREA DISPOSAL
HAZARD INDEX FROM DERMAL CONTACT WITH SURFACE WATER
INDUSTRIAL WORKER
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{CS \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{ADD}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Aluminum	1.9	37.7	1.0E-03	HEAST	1.0E+00	4.4E-05	4.4E-05	8.7E-04	8.7E-04
Arsenic	0.0063	0.024	1.0E-03	IRIS	3.0E-04	1.5E-07	4.9E-04	5.6E-07	1.9E-03
Iron	20.9	239.0	1.0E-03	NCEA	3.0E-01	4.8E-04	1.6E-03	5.5E-03	1.8E-02
Manganese	5.8	11.3	1.0E-03	IRIS	4.7E-02	1.3E-04	2.9E-03	2.6E-04	5.6E-03
Thallium	0.0020	0.0081	1.0E-03	HEAST	7.0E-05	4.6E-08	6.6E-04	1.9E-07	2.7E-03
Volatile Organic Compound									
Chloromethane	0.005	0.01	3.3E-03	--	--	3.8E-07	--	7.7E-07	--
Pesticide/Polychlorinated Biphenyl									
Aldrin	0.00003	0.00003	1.4E-03	IRIS	3.0E-05	9.7E-10	3.2E-05	9.7E-10	3.2E-05
Alpha-BHC	0.00003	0.00007	1.1E-02	--	--	7.7E-09	--	1.8E-08	--
Dieldrin	0.00003	0.00003	1.2E-02	IRIS	5.0E-05	8.4E-09	1.7E-04	8.4E-09	1.7E-04
Heptachlor	0.00003	0.00010	8.7E-03	IRIS	5.0E-04	6.1E-09	1.2E-05	2.0E-08	4.0E-05
Heptachlor epoxide	0.00001	0.00004	8.7E-03	IRIS	1.3E-05	2.0E-09	1.6E-04	8.1E-09	6.2E-04
Total							***6.0E-03***		***3.0E-02***

TABLE M-26
SITE 2 - R AREA DISPOSAL
CANCER RISKS FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT ADULT
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

CANCER RISK = LADD x Slope Factor

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor $(mg/kg\text{-}day)^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Aluminum	1.9	37.7	1.0E-03	--	--	1.5E-05	--	3.0E-04	--
Arsenic	0.0063	0.024	1.0E-03	IRIS	1.5E+00	5.0E-08	7.5E-08	1.9E-07	2.9E-07
Iron	20.9	239	1.0E-03	--	--	1.7E-04	--	1.9E-03	--
Manganese	5.8	11.3	1.0E-03	--	--	4.6E-05	--	9.0E-05	--
Thallium	0.0020	0.0081	1.0E-03	--	--	1.6E-08	--	6.4E-08	--
Volatile Organic Compound									
Chloromethane	0.005	0.01	3.3E-03	HEAST	1.3E-02	1.3E-07	1.7E-09	2.6E-07	3.4E-09
Pesticide/Polychlorinated Biphenyl									
Aldrin	0.00003	0.00003	1.4E-03	IRIS	1.7E+01	3.3E-10	5.7E-09	3.3E-10	5.7E-09
Alpha-BHC	0.00003	0.00007	1.1E-02	IRIS	6.3E+00	2.6E-09	1.7E-08	6.1E-09	3.9E-08
Dieldrin	0.00003	0.00003	1.2E-02	IRIS	1.6E+01	2.9E-09	4.6E-08	2.9E-09	4.6E-08
Heptachlor	0.00003	0.0001	8.7E-03	IRIS	4.5E+00	2.1E-09	9.3E-09	6.9E-09	3.1E-08
Heptachlor epoxide	0.00001	0.00004	8.7E-03	IRIS	9.1E+00	6.9E-10	6.3E-09	2.8E-09	2.5E-08
Total							***1.6E-07***		***4.4E-07***

TABLE M-27
SITE 2 - R AREA DISPOSAL
HAZARD INDEX FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT ADULT
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{CS \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{ADD}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Aluminum	1.9	37.7	1.0E-03	HEAST	1.0E+00	4.4E-05	4.4E-05	8.7E-04	8.7E-04
Arsenic	0.0063	0.0240	1.0E-03	IRIS	3.0E-04	1.5E-07	4.9E-04	5.6E-07	1.9E-03
Iron	20.9	239.0	1.0E-03	NCEA	3.0E-01	4.8E-04	1.6E-03	5.5E-03	1.8E-02
Manganese	5.8	11.3	1.0E-03	IRIS	4.7E-02	1.3E-04	2.9E-03	2.6E-04	5.6E-03
Thallium	0.0020	0.0081	1.0E-03	HEAST	7.0E-05	4.6E-08	6.6E-04	1.9E-07	2.7E-03
Volatile Organic Compound									
Chloromethane	0.005	0.010	3.3E-03	--	--	3.8E-07	--	7.7E-07	--
Pesticide/Polychlorinated Biphenyl									
Aldrin	0.00003	0.00003	1.4E-03	IRIS	3.0E-05	9.7E-10	3.2E-05	9.7E-10	3.2E-05
Alpha-BHC	0.00003	0.00007	1.1E-02	--	--	7.7E-09	--	1.8E-08	--
Dieldrin	0.00003	0.00003	1.2E-02	IRIS	5.0E-05	8.4E-09	1.7E-04	8.4E-09	1.7E-04
Heptachlor	0.00003	0.00010	8.7E-03	IRIS	5.0E-04	6.1E-09	1.2E-05	2.0E-08	4.0E-05
Heptachlor epoxide	0.00001	0.00004	8.7E-03	IRIS	1.3E-05	2.0E-09	1.6E-04	8.1E-09	6.2E-04
Total							***6.0E-03***		***3.0E-02***

TABLE M-28
SITE 2 - R AREA DISPOSAL
CANCER RISKS FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT CHILD
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{CANCER RISK} = \text{LADD} \times \text{Slope Factor}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor (mg/kg-day)$^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Aluminum	1.9	37.7	1.0E-03	--	--	9.0E-06	--	1.8E-04	--
Arsenic	0.0063	0.024	1.0E-03	IRIS	1.5E+00	3.0E-08	4.5E-08	1.1E-07	1.7E-07
Iron	20.9	239	1.0E-03	--	--	9.9E-05	--	1.1E-03	--
Manganese	5.8	11.3	1.0E-03	--	--	2.7E-05	--	5.3E-05	--
Thallium	0.0020	0.0081	1.0E-03	--	--	9.4E-09	--	3.8E-08	--
Volatile Organic Compound									
Chloromethane	0.005	0.01	3.3E-03	HEAST	1.3E-02	7.8E-08	1.0E-09	1.6E-07	2.0E-09
Pesticide/Polychlorinated Biphenyl									
Aldrin	0.00003	0.00003	1.4E-03	IRIS	1.7E+01	2.0E-10	3.4E-09	2.0E-10	3.4E-09
Alpha-BHC	0.00003	0.00007	1.1E-02	IRIS	6.3E+00	1.6E-09	9.8E-09	3.6E-09	2.3E-08
Dieldrin	0.00003	0.00003	1.2E-02	IRIS	1.6E+01	1.7E-09	2.7E-08	1.7E-09	2.7E-08
Heptachlor	0.00003	0.0001	8.7E-03	IRIS	4.5E+00	1.2E-09	5.5E-09	4.1E-09	1.8E-08
Heptachlor epoxide	0.00001	0.00004	8.7E-03	IRIS	9.1E+00	4.1E-10	3.7E-09	1.6E-09	1.5E-08
Total							***9.5E-08***		***2.6E-07***

TABLE M-29
SITE 2 - R AREA DISPOSAL
HAZARD INDEX FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT CHILD
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{CS \times SA \times PC \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{ADD}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Aluminum	1.9	37.7	1.0E-03	HEAST	1.0E+00	1.0E-04	1.0E-04	2.1E-03	2.1E-03
Arsenic	0.0063	0.0240	1.0E-03	IRIS	3.0E-04	3.5E-07	1.2E-03	1.3E-06	4.4E-03
Iron	20.9	239.0	1.0E-03	NCEA	3.0E-01	1.2E-03	3.8E-03	1.3E-02	4.4E-02
Manganese	5.8	11.3	1.0E-03	IRIS	4.7E-02	3.2E-04	6.8E-03	6.2E-04	1.3E-02
Thallium	0.0020	0.0081	1.0E-03	HEAST	7.0E-05	1.1E-07	1.6E-03	4.5E-07	6.4E-03
Volatile Organic Compound									
Chloromethane	0.005	0.01	3.3E-03	--	--	9.1E-07	--	1.8E-06	--
Pesticide/Polychlorinated Biphenyl									
Aldrin	0.00003	0.00003	1.4E-03	IRIS	3.0E-05	2.3E-09	7.7E-05	2.3E-09	7.7E-05
Alpha-BHC	0.00003	0.00007	1.1E-02	--	--	1.8E-08	--	4.2E-08	--
Dieldrin	0.00003	0.00003	1.2E-02	IRIS	5.0E-05	2.0E-08	4.0E-04	2.0E-08	4.0E-04
Heptachlor	0.00003	0.00010	8.7E-03	IRIS	5.0E-04	1.4E-08	2.9E-05	4.8E-08	9.6E-05
Heptachlor epoxide	0.00001	0.00004	8.7E-03	IRIS	1.3E-05	4.8E-09	3.7E-04	1.9E-08	1.5E-03
Total							***1.4E-02***		***7.2E-02***

TABLE M-30
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	37,500	19,100	--	1,900,000	--	--	0.02	0.01
Chromium	106	58.2	450	--	2.4E-07	1.3E-07	--	--
Copper	86.0	56.2	--	70,000	--	--	< 0.01	< 0.01
Mercury	0.49	0.31	--	560	--	--	< 0.01	< 0.01
Silver	0.50	0.30	--	9,400	--	--	< 0.01	< 0.01
Vanadium	113	66.7	--	13,000	--	--	< 0.01	< 0.01
Zinc	436	282	--	560,000	--	--	< 0.01	< 0.01
Semivolatile Organic Compound								
1,1'-Biphenyl	0.009	0.009	--	24,000	--	--	< 0.01	< 0.01
1-Methylnaphthalene	0.03	0.03	--	190	--	--	< 0.01	< 0.01
2,4-Dimethylphenol	0.01	0.01	--	21,000	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
2-Methylnaphthalene	0.05	0.05	--	190	--	--	< 0.01	< 0.01
4-Methylphenol	0.005	0.005	--	5,300	--	--	< 0.01	< 0.01
Acenapthylene	0.03	0.03	--	28,000	--	--	< 0.01	< 0.01
Anthracene	0.04	0.04	--	220,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.09	0.09	3.6	--	2.5E-08	2.5E-08	--	--
Benzo(a)pyrene	0.1	0.1	0.36	--	2.8E-07	2.8E-07	--	--
Benzo(b)fluoranthene	0.2	0.2	3.6	--	5.6E-08	5.6E-08	--	--
Benzo(e)pyrene	0.3	0.2	--	26,000	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.2	0.2	--	26,000	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.1	0.1	36	--	2.8E-09	2.8E-09	--	--
Benzoic acid	0.5	0.3	--	4,300,000	--	--	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	3	0.7	210	21,000	1.4E-08	3.3E-09	< 0.01	< 0.01
Carbazole	0.02	0.02	150	--	1.3E-10	1.3E-10	--	--
Chrysene	0.2	0.2	360	--	5.6E-10	5.6E-10	--	--
Dibenzofuran	0.007	0.007	--	3,200	--	--	< 0.01	< 0.01
Fluoranthene	0.2	0.2	--	37,000	--	--	< 0.01	< 0.01

TABLE M-30
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Fluorene	0.006	0.006	--	22,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.1	0.1	3.6	--	2.8E-08	2.8E-08	--	--
Naphthalene	0.01	0.01	--	190	--	--	< 0.01	< 0.01
Phenanthrene	0.05	0.05	--	190	--	--	< 0.01	< 0.01
Pyrene	0.2	0.2	--	26,000	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.005	0.002	19	--	2.6E-10	1.1E-10	--	--
2,4'-DDE	0.0006	0.0004	13	--	4.6E-11	3.1E-11	--	--
2,4'-DDT	0.002	0.001	13	800	1.5E-10	7.7E-11	< 0.01	< 0.01
4,4'-DDD	0.01	0.01	19	--	5.3E-10	5.3E-10	--	--
4,4'-DDE	0.02	0.02	13	--	1.5E-09	1.5E-09	--	--
4,4'-DDT	0.02	0.02	13	800	1.5E-09	1.5E-09	< 0.01	< 0.01
Aldrin	0.0004	0.0004	0.18	32	2.2E-09	2.2E-09	< 0.01	< 0.01
Alpha-chlordane	0.04	0.04	12	750	3.3E-09	3.3E-09	< 0.01	< 0.01
Dieldrin	0.0008	0.0008	0.19	53	4.2E-09	4.2E-09	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.0004	0.0004	3.2	450	1.3E-10	1.3E-10	< 0.01	< 0.01
Gamma-chlordane	0.03	0.03	12	750	2.5E-09	2.5E-09	< 0.01	< 0.01
Hexachlorobenzene	0.0005	0.0003	1.9	869	2.6E-10	1.6E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.0004	0.0002	1.3	--	3.1E-10	1.5E-10	--	--
PCB-105(2,3,3',4,4')	0.0002	0.0002	1.3	--	1.5E-10	1.5E-10	--	--
PCB-118(2,3',4,4',5)	0.0002	0.0002	1.3	--	1.5E-10	1.5E-10	--	--
PCB-126(3,3',4,4',5)	0.0001	0.0001	1.3	--	7.7E-11	7.7E-11	--	--
PCB-128(2,2',3,3',4,4')	0.002	0.0007	1.3	--	1.5E-09	5.4E-10	--	--
PCB-138(2,2',3,4,4',5')	0.002	0.0008	1.3	--	1.5E-09	6.2E-10	--	--
PCB-153(2,2',4,4',5,5')	0.0005	0.0003	1.3	--	3.8E-10	2.3E-10	--	--
PCB-180(2,2',3,4,4',5,5')	0.0004	0.0002	1.3	--	3.1E-10	1.5E-10	--	--
PCB-187(2,2',3,4',5,5',6)	0.0002	0.0002	1.3	--	1.5E-10	1.5E-10	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0008	0.0006	1.3	--	6.2E-10	4.6E-10	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0003	0.0002	1.3	--	2.3E-10	1.5E-10	--	--

TABLE M-30
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-77(3,3',4,4')	0.0003	0.0002	1.3	--	2.3E-10	1.5E-10	--	--
Technical chlordane	0.2	0.2	12	750	1.7E-08	1.7E-08	< 0.01	< 0.01
Trans-nonachlor	0.004	0.004	12	750	3.3E-10	3.3E-10	< 0.01	< 0.01
				TOTAL:	**6.8E-07**	**5.6E-07**	**0.02**	**0.01**

TABLE M-31
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	37,500	18,300	--	1,900,000	--	--	0.02	< 0.01
Chromium	106	55.4	450	--	2.4E-07	1.2E-07	--	--
Copper	86.0	49.7	--	70,000	--	--	< 0.01	< 0.01
Mercury	0.49	0.28	--	560	--	--	< 0.01	< 0.01
Silver	0.50	0.26	--	9,400	--	--	< 0.01	< 0.01
Vanadium	136	71.6	--	13,000	--	--	0.01	< 0.01
Zinc	436	173	--	560,000	--	--	< 0.01	< 0.01
Volatile Organic Compound								
4-Methyl-2-pentanone	0.03	0.03	--	2,800	--	--	< 0.01	< 0.01
Semivolatile Organic Compound								
1,1'-Biphenyl	0.009	0.009	--	24,000	--	--	< 0.01	< 0.01
1-Methylnaphthalene	0.03	0.03	--	190	--	--	< 0.01	< 0.01
2,4-Dimethylphenol	0.01	0.01	--	21,000	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
2-Methylnaphthalene	0.05	0.05	--	190	--	--	< 0.01	< 0.01
4-Methylphenol	0.005	0.005	--	5,300	--	--	< 0.01	< 0.01
Acenapthylene	0.03	0.03	--	28,000	--	--	< 0.01	< 0.01
Anthracene	0.04	0.04	--	220,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.09	0.09	3.6	--	2.5E-08	2.5E-08	--	--
Benzo(a)pyrene	0.1	0.1	0.36	--	2.8E-07	2.8E-07	--	--
Benzo(b)fluoranthene	0.2	0.2	3.6	--	5.6E-08	5.6E-08	--	--
Benzo(e)pyrene	0.3	0.2	--	26,000	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.2	0.2	--	26,000	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.1	0.1	36	--	2.8E-09	2.8E-09	--	--
Benzoic acid	0.5	0.3	--	4,300,000	--	--	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	3	0.6	210	21,000	1.4E-08	2.9E-09	< 0.01	< 0.01
Carbazole	0.02	0.02	150	--	1.3E-10	1.3E-10	--	--
Chrysene	0.2	0.2	360	--	5.6E-10	5.6E-10	--	--

TABLE M-31
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Dibenzofuran	0.007	0.007	--	3,200	--	--	< 0.01	< 0.01
Fluoranthene	0.2	0.2	--	37,000	--	--	< 0.01	< 0.01
Fluorene	0.006	0.006	--	22,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.1	0.1	3.6	--	2.8E-08	2.8E-08	--	--
Naphthalene	0.01	0.01	--	190	--	--	< 0.01	< 0.01
Phenanthrene	0.05	0.05	--	190	--	--	< 0.01	< 0.01
Phenol	0.5	0.4	--	640,000	--	--	< 0.01	< 0.01
Pyrene	0.2	0.2	--	26,000	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.005	0.002	19	--	2.6E-10	1.1E-10	--	--
2,4'-DDE	0.0006	0.0004	13	--	4.6E-11	3.1E-11	--	--
2,4'-DDT	0.002	0.001	13	800	1.5E-10	7.7E-11	< 0.01	< 0.01
4,4'-DDD	0.01	0.01	19	--	5.3E-10	5.3E-10	--	--
4,4'-DDE	0.02	0.02	13	--	1.5E-09	1.5E-09	--	--
4,4'-DDT	0.02	0.02	13	800	1.5E-09	1.5E-09	< 0.01	< 0.01
Aldrin	0.0004	0.0004	0.18	32	2.2E-09	2.2E-09	< 0.01	< 0.01
Alpha-chlordane	0.04	0.01	12	750	3.3E-09	8.3E-10	< 0.01	< 0.01
Dieldrin	0.0008	0.0008	0.19	53	4.2E-09	4.2E-09	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.0004	0.0004	3.2	450	1.3E-10	1.3E-10	< 0.01	< 0.01
Gamma-chlordane	0.03	0.01	12	750	2.5E-09	8.3E-10	< 0.01	< 0.01
Hexachlorobenzene	0.0005	0.0003	1.9	860	2.6E-10	1.6E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.0004	0.0002	1.3	--	3.1E-10	1.5E-10	--	--
PCB-105(2,3,3',4,4')	0.0002	0.0002	1.3	--	1.5E-10	1.5E-10	--	--
PCB-118(2,3',4,4',5)	0.0002	0.0002	1.3	--	1.5E-10	1.5E-10	--	--
PCB-126(3,3',4,4',5)	0.0001	0.0001	1.3	--	7.7E-11	7.7E-11	--	--
PCB-128(2,2',3,3',4,4')	0.002	0.0007	1.3	--	1.5E-09	5.4E-10	--	--
PCB-138(2,2',3,4,4',5')	0.002	0.0008	1.3	--	1.5E-09	6.2E-10	--	--
PCB-153(2,2',4,4',5,5')	0.0005	0.0003	1.3	--	3.8E-10	2.3E-10	--	--
PCB-180(2,2',3,4,4',5,5')	0.0004	0.0002	1.3	--	3.1E-10	1.5E-10	--	--

TABLE M-31
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-187(2,2',3,4',5,5',6)	0.0002	0.0002	1.3	--	1.5E-10	1.5E-10	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0008	0.0006	1.3	--	6.2E-10	4.6E-10	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0003	0.0002	1.3	--	2.3E-10	1.5E-10	--	--
PCB-77(3,3',4,4')	0.0003	0.0002	1.3	--	2.3E-10	1.5E-10	--	--
Technical chlordane	0.2	0.2	12	750	1.7E-08	1.7E-08	< 0.01	< 0.01
Trans-nonachlor	0.004	0.004	12	750	3.3E-10	3.3E-10	< 0.01	< 0.01
				TOTAL:	**6.8E-07**	**5.5E-07**	**0.03**	**0.00**

TABLE M-32
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO SURFACE SOILS (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	37,500	19,100	--	75,000	--	--	0.50	0.25
Chromium	106	58.2	210	--	5.0E-07	2.8E-07	--	--
Copper	86.0	56.2	--	2,800	--	--	0.03	0.02
Mercury	0.49	0.31	--	22	--	--	0.02	0.01
Silver	0.50	0.30	--	370	--	--	< 0.01	< 0.01
Vanadium	113	66.7	--	520	--	--	0.22	0.13
Zinc	436	282	--	22,000	--	--	0.02	0.01
Semivolatile Organic Compound								
1,1'-Biphenyl	0.009	0.009	--	2,300	--	--	< 0.01	< 0.01
1-Methylnaphthalene	0.03	0.03	--	55	--	--	< 0.01	< 0.01
2,4-Dimethylphenol	0.01	0.01	--	1,100	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
2-Methylnaphthalene	0.05	0.05	--	55	--	--	< 0.01	< 0.01
4-Methylphenol	0.005	0.005	--	270	--	--	< 0.01	< 0.01
Acenapthylene	0.03	0.03	--	2,600	--	--	< 0.01	< 0.01
Anthracene	0.04	0.04	--	14,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.09	0.09	0.56	--	1.6E-07	1.6E-07	--	--
Benzo(a)pyrene	0.1	0.1	0.056	--	1.8E-06	1.8E-06	--	--
Benzo(b)fluoranthene	0.2	0.2	0.56	--	3.6E-07	3.6E-07	--	--
Benzo(e)pyrene	0.3	0.2	--	1,500	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.2	0.2	--	1,500	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.1	0.1	0.61	--	1.6E-07	1.6E-07	--	--
Benzoic acid	0.5	0.3	--	220,000	--	--	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	3	0.7	32	1,100	9.4E-08	2.2E-08	< 0.01	< 0.01
Carbazole	0.02	0.02	22	--	9.1E-10	9.1E-10	--	--
Chrysene	0.2	0.2	6.1	--	3.3E-08	3.3E-08	--	--
Dibenzofuran	0.007	0.007	--	210	--	--	< 0.01	< 0.01
Fluoranthene	0.2	0.2	--	2,000	--	--	< 0.01	< 0.01

TABLE M-32
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO SURFACE SOILS (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Fluorene	0.006	0.006	--	1,800	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.1	0.1	0.56	--	1.8E-07	1.8E-07	--	--
Naphthalene	0.01	0.01	--	55	--	--	< 0.01	< 0.01
Phenanthrene	0.05	0.05	--	55	--	--	< 0.01	< 0.01
Pyrene	0.2	0.2	--	1,500	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.005	0.002	2.4	--	2.1E-09	8.3E-10	--	--
2,4'-DDE	0.0006	0.0004	1.7	--	3.5E-10	2.4E-10	--	--
2,4'-DDT	0.002	0.001	1.7	35	1.2E-09	5.9E-10	< 0.01	< 0.01
4,4'-DDD	0.01	0.01	2.4	--	4.2E-09	4.2E-09	--	--
4,4'-DDE	0.02	0.02	1.7	--	1.2E-08	1.2E-08	--	--
4,4'-DDT	0.02	0.02	1.7	35	1.2E-08	1.2E-08	< 0.01	< 0.01
Aldrin	0.0004	0.0004	0.026	1.6	1.5E-08	1.5E-08	< 0.01	< 0.01
Alpha-chlordane	0.04	0.04	1.6	33	2.5E-08	2.5E-08	< 0.01	< 0.01
Dieldrin	0.0008	0.0008	0.028	2.7	2.9E-08	2.9E-08	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.0004	0.0004	0.42	20	9.5E-10	9.5E-10	< 0.01	< 0.01
Gamma-chlordane	0.03	0.03	1.6	33	1.9E-08	1.9E-08	< 0.01	< 0.01
Hexachlorobenzene	0.0005	0.0003	0.28	44	1.8E-09	1.1E-09	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.0004	0.0002	0.2	--	2.0E-09	1.0E-09	--	--
PCB-105(2,3,3',4,4')	0.0002	0.0002	0.2	--	1.0E-09	1.0E-09	--	--
PCB-118(2,3',4,4',5)	0.0002	0.0002	0.2	--	1.0E-09	1.0E-09	--	--
PCB-126(3,3',4,4',5)	0.0001	0.0001	0.2	--	5.0E-10	5.0E-10	--	--
PCB-128(2,2',3,3',4,4')	0.002	0.0007	0.2	--	1.0E-08	3.5E-09	--	--
PCB-138(2,2',3,4,4',5')	0.002	0.0008	0.2	--	1.0E-08	4.0E-09	--	--
PCB-153(2,2',4,4',5,5')	0.0005	0.0003	0.2	--	2.5E-09	1.5E-09	--	--
PCB-180(2,2',3,4,4',5,5')	0.0004	0.0002	0.2	--	2.0E-09	1.0E-09	--	--
PCB-187(2,2',3,4',5,5',6)	0.0002	0.0002	0.2	--	1.0E-09	1.0E-09	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0008	0.0006	0.2	--	4.0E-09	3.0E-09	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0003	0.0002	0.2	--	1.5E-09	1.0E-09	--	--

TABLE M-32
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO SURFACE SOILS (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-77(3,3',4,4')	0.0003	0.0002	0.2	--	1.5E-09	1.0E-09	--	--
Technical chlordane	0.2	0.2	1.6	33	1.3E-07	1.3E-07	< 0.01	< 0.01
Trans-nonachlor	0.004	0.004	1.6	33	2.5E-09	2.5E-09	< 0.01	< 0.01
				TOTAL:	**3.6E-06**	**3.2E-06**	**0.79**	**0.43**

TABLE M-33
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	37,500	18,300	--	75,000	--	--	0.50	0.24
Chromium	106	55.4	210	--	5.0E-07	2.6E-07	--	--
Copper	86.0	49.7	--	2,800	--	--	0.03	0.02
Mercury	0.49	0.28	--	22	--	--	0.02	0.01
Silver	0.50	0.26	--	370	--	--	< 0.01	< 0.01
Vanadium	136	71.6	--	520	--	--	0.26	0.14
Zinc	436	173	--	22,000	--	--	0.02	< 0.01
Volatile Organic Compound								
4-Methyl-2-pentanone	0.03	0.03	--	750	--	--	< 0.01	< 0.01
Semivolatile Organic Compound								
1,1'-Biphenyl	0.009	0.009	--	2,300	--	--	< 0.01	< 0.01
1-Methylnaphthalene	0.03	0.03	--	55	--	--	< 0.01	< 0.01
2,4-Dimethylphenol	0.01	0.01	--	1,100	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
2-Methylnaphthalene	0.05	0.05	--	55	--	--	< 0.01	< 0.01
4-Methylphenol	0.005	0.005	--	270	--	--	< 0.01	< 0.01
Acenaphthylene	0.03	0.03	--	2,600	--	--	< 0.01	< 0.01
Anthracene	0.04	0.04	--	14,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	0.09	0.09	0.56	--	1.6E-07	1.6E-07	--	--
Benzo(a)pyrene	0.1	0.1	0.056	--	1.8E-06	1.8E-06	--	--
Benzo(b)fluoranthene	0.2	0.2	0.56	--	3.6E-07	3.6E-07	--	--
Benzo(e)pyrene	0.3	0.2	--	1,500	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.2	0.2	--	1,500	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	0.1	0.1	0.61	--	1.6E-07	1.6E-07	--	--
Benzoic acid	0.5	0.3	--	220,000	--	--	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	3	0.6	32	1,100	9.4E-08	1.9E-08	< 0.01	< 0.01
Carbazole	0.02	0.02	22	--	9.1E-10	9.1E-10	--	--
Chrysene	0.2	0.2	6.1	--	3.3E-08	3.3E-08	--	--

TABLE M-33
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Dibenzofuran	0.007	0.007	--	210	--	--	< 0.01	< 0.01
Fluoranthene	0.2	0.2	--	2,000	--	--	< 0.01	< 0.01
Fluorene	0.006	0.006	--	1,800	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	0.1	0.1	0.56	--	1.8E-07	1.8E-07	--	--
Naphthalene	0.01	0.01	--	55	--	--	< 0.01	< 0.01
Phenanthrene	0.05	0.05	--	55	--	--	< 0.01	< 0.01
Phenol	0.5	0.4	--	33,000	--	--	< 0.01	< 0.01
Pyrene	0.2	0.2	--	1,500	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.005	0.002	2.4	--	2.1E-09	8.3E-10	--	--
2,4'-DDE	0.0006	0.0004	1.7	--	3.5E-10	2.4E-10	--	--
2,4'-DDT	0.002	0.001	1.7	35	1.2E-09	5.9E-10	< 0.01	< 0.01
4,4'-DDD	0.01	0.01	2.4	--	4.2E-09	4.2E-09	--	--
4,4'-DDE	0.02	0.02	1.7	--	1.2E-08	1.2E-08	--	--
4,4'-DDT	0.02	0.02	1.7	35	1.2E-08	1.2E-08	< 0.01	< 0.01
Aldrin	0.0004	0.0004	0.026	1.6	1.5E-08	1.5E-08	< 0.01	< 0.01
Alpha-chlordane	0.04	0.01	1.6	33	2.5E-08	6.3E-09	< 0.01	< 0.01
Dieldrin	0.0008	0.0008	0.028	2.7	2.9E-08	2.9E-08	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.0004	0.0004	0.42	20	9.5E-10	9.5E-10	< 0.01	< 0.01
Gamma-chlordane	0.03	0.01	1.6	33	1.9E-08	6.3E-09	< 0.01	< 0.01
Hexachlorobenzene	0.0005	0.0003	0.28	44	1.8E-09	1.1E-09	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.0004	0.0002	0.2	--	2.0E-09	1.0E-09	--	--
PCB-105(2,3,3',4,4')	0.0002	0.0002	0.2	--	1.0E-09	1.0E-09	--	--
PCB-118(2,3',4,4',5)	0.0002	0.0002	0.2	--	1.0E-09	1.0E-09	--	--
PCB-126(3,3',4,4',5)	0.0001	0.0001	0.2	--	5.0E-10	5.0E-10	--	--
PCB-128(2,2',3,3',4,4')	0.002	0.0007	0.2	--	1.0E-08	3.5E-09	--	--
PCB-138(2,2',3,4,4',5')	0.002	0.0008	0.2	--	1.0E-08	4.0E-09	--	--
PCB-153(2,2',4,4',5,5')	0.0005	0.0003	0.2	--	2.5E-09	1.5E-09	--	--
PCB-180(2,2',3,4,4',5,5')	0.0004	0.0002	0.2	--	2.0E-09	1.0E-09	--	--

TABLE M-33
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-187(2,2',3,4',5,5',6)	0.0002	0.0002	0.2	--	1.0E-09	1.0E-09	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0008	0.0006	0.2	--	4.0E-09	3.0E-09	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0003	0.0002	0.2	--	1.5E-09	1.0E-09	--	--
PCB-77(3,3',4,4')	0.0003	0.0002	0.2	--	1.5E-09	1.0E-09	--	--
Technical chlordane	0.2	0.2	1.6	33	1.3E-07	1.3E-07	< 0.01	< 0.01
Trans-nonachlor	0.004	0.004	1.6	33	2.5E-09	2.5E-09	< 0.01	< 0.01
				TOTAL:	**3.6E-06**	**3.2E-06**	**0.83**	**0.41**

TABLE M-34
SITE 9 - FROID TAYLOR ROADS
CANCER RISKS FROM DERMAL CONTACT WITH SURFACE WATER
INDUSTRIAL WORKER
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

CANCER RISK = LADD x Slope Factor

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor $(mg/kg\text{-}day)^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Arsenic	0.28	0.28	1.0E-03	IRIS	1.5E+00	2.3E-06	3.5E-06	2.3E-06	3.5E-06
Manganese	3.0	4.5	1.0E-03	--	--	2.5E-05	--	3.7E-05	--
Thallium	0.0035	0.0084	1.0E-03	--	--	2.9E-08	--	7.0E-08	--
Total							***3.5E-06***		***3.5E-06***

TABLE M-35
SITE 9 - FROID TAYLOR ROADS
HAZARD INDEX FROM DERMAL CONTACT WITH SURFACE WATER
INDUSTRIAL WORKER
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{ADD}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Arsenic	0.28	0.28	1.0E-03	IRIS	3.0E-04	6.5E-06	2.2E-02	6.5E-06	2.2E-02
Manganese	3.0	4.5	1.0E-03	IRIS	4.7E-02	7.0E-05	1.5E-03	1.0E-04	2.2E-03
Thallium	0.0035	0.0084	1.0E-03	HEAST	7.0E-05	8.1E-08	1.2E-03	1.9E-07	2.8E-03
Total							***2.4E-02***		***2.7E-02***

TABLE M-36
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISK FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT ADULT
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{CANCER RISK} = \text{LADD} \times \text{Slope Factor}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor $(mg/kg\text{-}day)^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Arsenic	0.28	0.28	1.0E-03	IRIS	1.5E+00	2.2E-06	3.3E-06	2.2E-06	3.3E-06
Manganese	3.0	4.5	1.0E-03	--	--	2.4E-05	--	3.6E-05	--
Thallium	0.0035	0.0084	1.0E-03	--	--	2.8E-08	--	6.7E-08	--
Total							***3.3E-06***		***3.3E-06***

TABLE M-37
SITE 9 - FROID AND TAYLOR ROADS
HAZARD INDEX FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT ADULT
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{ADD}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Arsenic	0.280	0.28	1.0E-03	IRIS	3.0E-04	6.5E-06	2.2E-02	6.5E-06	2.2E-02
Manganese	3.0	4.5	1.0E-03	IRIS	4.7E-02	7.0E-05	1.5E-03	1.0E-04	2.2E-03
Thallium	0.0035	0.0084	1.0E-03	HEAST	7.0E-05	8.1E-08	1.2E-03	1.9E-07	2.8E-03
Total							***2.4E-02***		***2.7E-02***

TABLE M-38
SITE 9 - FROID AND TAYLOR ROADS
CANCER RISKS FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT CHILD
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

CANCER RISK = LADD x Slope Factor

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor (mg/kg-day)$^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Arsenic	0.28	0.28	1.0E-03	IRIS	1.5E+00	1.3E-06	2.0E-06	1.3E-06	2.0E-06
Manganese	3.0	4.5	1.0E-03	--	--	1.4E-05	--	2.1E-05	--
Thallium	0.0035	0.0084	1.0E-03	--	--	1.7E-08	--	4.0E-08	--
Total							***2.0E-06***		***2.0E-06***

TABLE M-39
SITE 9 - FROID AND TAYLOR ROADS
HAZARD INDEX FROM DERMAL EXPOSURE TO SURFACE WATER
RESIDENT CHILD
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{ADD}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Arsenic	0.28	0.28	1.0E-03	IRIS	3.0E-04	1.5E-05	5.1E-02	1.5E-05	5.1E-02
Manganese	3.0	4.5	1.0E-03	IRIS	4.7E-02	1.7E-04	3.5E-03	2.5E-04	5.3E-03
Thallium	0.0035	0.0084	1.0E-03	HEAST	7.0E-05	1.9E-07	2.8E-03	4.6E-07	6.6E-03
Total							***5.8E-02***		***6.3E-02***

TABLE M-40
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	42,700	17,100	--	1,900,000	--	--	0.02	< 0.01
Antimony	7.1	2.0	--	750	--	--	< 0.01	< 0.01
Arsenic	27.1	12.1	3	480	9.0E-06	4.0E-06	0.06	0.03
Beryllium	0.84	0.23	--	3,700	--	--	< 0.01	< 0.01
Cadmium	20.8	3.3	3,000	930	6.9E-09	1.1E-09	0.02	< 0.01
Chromium	122	43.5	450	--	2.7E-07	9.7E-08	--	--
Hexavalent chromium	0.060	0.060	64	9,400	9.4E-10	9.4E-10	< 0.01	< 0.01
Cobalt	39.3	16.3	--	29,000	--	--	< 0.01	< 0.01
Copper	607	65.0	--	70,000	--	--	< 0.01	< 0.01
Mercury	18.5	0.70	--	560	--	--	0.03	< 0.01
Nickel	123	51.2	--	37,000	--	--	< 0.01	< 0.01
Selenium	3.5	0.68	--	9,400	--	--	< 0.01	< 0.01
Silver	4.4	0.26	--	9,400	--	--	< 0.01	< 0.01
Thallium	2.4	0.48	--	130	--	--	0.02	< 0.01
Vanadium	139	66.7	--	13,000	--	--	0.01	< 0.01
Zinc	3,010	319	--	560,000	--	--	< 0.01	< 0.01
Semivolatile Organic Compound								
1-Methylphenanthrene	0.4	0.4	--	190	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
Acenaphthene	0.3	0.3	--	28,000	--	--	< 0.01	< 0.01
Acenapthylene	0.3	0.3	--	28,000	--	--	< 0.01	< 0.01
Anthracene	2	1	--	220,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	4	1	3.6	--	1.1E-06	2.8E-07	--	--
Benzo(a)pyrene	3	1	0.36	--	8.3E-06	2.8E-06	--	--
Benzo(b)fluoranthene	3	1	3.6	--	8.3E-07	2.8E-07	--	--
Benzo(e)pyrene	2	1	--	26,000	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	1	0.9	--	26,000	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	3	1	36	--	8.3E-08	2.8E-08	--	--

TABLE M-40
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Benzoic acid	2	2	--	4,300,000	--	--	< 0.01	< 0.01
Butylbenzylphthalate	0.08	0.08	--	210,000	--	--	< 0.01	< 0.01
Carbazole	0.9	0.9	150	--	6.0E-09	6.0E-09	--	--
Chrysene	6	1	360	--	1.7E-08	2.8E-09	--	--
Dibenz(a,h)anthracene	0.6	0.6	0.36	--	1.7E-06	1.7E-06	--	--
Dibenzofuran	0.2	0.2	--	3,200	--	--	< 0.01	< 0.01
Dibenzothiophene	0.2	0.2	--	--	--	--	--	--
Fluoranthene	14	1	--	37,000	--	--	< 0.01	< 0.01
Fluorene	0.4	0.4	--	22,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	1	1	3.6	--	2.8E-07	2.8E-07	--	--
Naphthalene	0.1	0.1	--	190	--	--	< 0.01	< 0.01
Pentachlorophenol	0.8	0.8	15	19,000	5.3E-08	5.3E-08	< 0.01	< 0.01
Perylene	0.8	0.8	--	190	--	--	< 0.01	< 0.01
Phenanthrene	4	1	--	190	--	--	0.02	< 0.01
Phenol	0.9	0.9	--	640,000	--	--	< 0.01	< 0.01
Pyrene	13	1	--	26,000	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.008	0.002	19	--	4.2E-10	1.1E-10	--	--
2,4'-DDE	0.003	0.0006	13	--	2.3E-10	4.6E-11	--	--
2,4'-DDT	0.03	0.002	13	800	2.3E-09	1.5E-10	< 0.01	< 0.01
4,4'-DDD	0.3	0.02	19	--	1.6E-08	1.1E-09	--	--
4,4'-DDE	0.03	0.006	13	--	2.3E-09	4.6E-10	--	--
4,4'-DDT	0.2	0.02	13	800	1.5E-08	1.5E-09	< 0.01	< 0.01
Aldrin	0.0005	0.0005	0.18	32	2.8E-09	2.8E-09	< 0.01	< 0.01
Alpha-chlordane	0.08	0.007	12	750	6.7E-09	5.8E-10	< 0.01	< 0.01
Dieldrin	0.006	0.002	0.19	53	3.2E-08	1.1E-08	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.002	0.0009	3.2	450	6.3E-10	2.8E-10	< 0.01	< 0.01
Heptachlor	0.0007	0.0007	0.67	530	1.0E-09	1.0E-09	< 0.01	< 0.01
Heptachlor epoxide	0.006	0.0008	0.33	14	1.8E-08	2.4E-09	< 0.01	< 0.01

TABLE M-40
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Hexachlorobenzene	0.0004	0.0004	1.9	860	2.1E-10	2.1E-10	< 0.01	< 0.01
Mirex	0.005	0.0007	1.7	210	2.9E-09	4.1E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.007	0.001	1.3	--	5.4E-09	7.7E-10	--	--
PCB-105(2,3,3',4,4')	0.003	0.0009	1.3	--	2.3E-09	6.9E-10	--	--
PCB-118(2,3',4,4',5)	0.005	0.001	1.3	--	3.8E-09	7.7E-10	--	--
PCB-126(3,3',4,4',5)	0.0006	0.0005	1.3	--	4.6E-10	3.8E-10	--	--
PCB-128(2,2',3,3',4,4')	0.003	0.0006	1.3	--	2.3E-09	4.6E-10	--	--
PCB-138(2,2',3,4,4',5')	0.01	0.003	1.3	--	7.7E-09	2.3E-09	--	--
PCB-153(2,2',4,4',5,5')	0.01	0.002	1.3	--	7.7E-09	1.5E-09	--	--
PCB-170(2,2',3,3',4,4',5)	0.007	0.0008	1.3	--	5.4E-09	6.2E-10	--	--
PCB-18(2,2',5)	0.0008	0.0005	1.3	--	6.2E-10	3.8E-10	--	--
PCB-180(2,2',3,4,4',5,5')	0.02	0.002	1.3	--	1.5E-08	1.5E-09	--	--
PCB-187(2,2',3,4',5,5',6)	0.007	0.001	1.3	--	5.4E-09	7.7E-10	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.001	0.0006	1.3	--	7.7E-10	4.6E-10	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0009	0.0006	1.3	--	6.9E-10	4.6E-10	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0003	0.0003	1.3	--	2.3E-10	2.3E-10	--	--
PCB-28(2,4,4')	0.002	0.0006	1.3	--	1.5E-09	4.6E-10	--	--
PCB-44(2,2',3,5')	0.002	0.0007	1.3	--	1.5E-09	5.4E-10	--	--
PCB-52(2,2',5,5')	0.002	0.0008	1.3	--	1.5E-09	6.2E-10	--	--
PCB-66(2,3',4,4')	0.001	0.0006	1.3	--	7.7E-10	4.6E-10	--	--
PCB-77(3,3',4,4')	0.0009	0.0006	1.3	--	6.9E-10	4.6E-10	--	--
PCB-8(2,4')	0.006	0.0008	1.3	--	4.6E-09	6.2E-10	--	--
Trans-nonachlor	0.07	0.008	12	750	5.8E-09	6.7E-10	< 0.01	< 0.01
Dioxin/Furan								
2,3,7,8-TCDD TEQ	0.000343	0.000343	0.00003	--	1.1E-05	1.1E-05	--	--
Explosive								
1,3-Dinitrobenzene	0.1	0.09	--	110	--	--	< 0.01	< 0.01
				TOTAL:	**3.3E-05**	**2.1E-05**	**0.18**	**0.03**

TABLE M-41
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	42,700	17,600	--	1,900,000	--	--	0.02	< 0.01
Antimony	7.1	1.6	--	750	--	--	< 0.01	< 0.01
Arsenic	37.0	10.7	3	480	1.2E-05	3.6E-06	0.08	0.02
Barium	546	181	--	120,000	--	--	< 0.01	< 0.01
Beryllium	0.84	0.13	--	3,700	--	--	< 0.01	< 0.01
Cadmium	20.8	1.1	3,000	930	6.9E-09	3.7E-10	0.02	< 0.01
Chromium	122	47.5	450	--	2.7E-07	1.1E-07	--	--
Hexavalent chromium	0.060	0.060	64	9,400	9.4E-10	9.4E-10	< 0.01	< 0.01
Cobalt	39.3	17.4	--	29,000	--	--	< 0.01	< 0.01
Copper	607	53.6	--	70,000	--	--	< 0.01	< 0.01
Mercury	18.5	0.35	--	560	--	--	0.03	< 0.01
Molybdenum	12.9	1.3	--	9,400	--	--	< 0.01	< 0.01
Nickel	123	58.6	--	37,000	--	--	< 0.01	< 0.01
Selenium	4.8	0.73	--	9,400	--	--	< 0.01	< 0.01
Silver	4.4	0.21	--	9,400	--	--	< 0.01	< 0.01
Thallium	2.4	0.51	--	130	--	--	0.02	< 0.01
Vanadium	163	73.4	--	13,000	--	--	0.01	< 0.01
Zinc	3,010	217	--	560,000	--	--	< 0.01	< 0.01
Volatile Organic Compound								
2-Butanone	0.7	0.05	--	27,000	--	--	< 0.01	< 0.01
Acetone	0.3	0.1	--	6,100	--	--	< 0.01	< 0.01
Carbon disulfide	0.3	0.02	--	1,200	--	--	< 0.01	< 0.01
Ethylbenzene	0.2	0.02	--	5,800	--	--	< 0.01	< 0.01
Xylene	0.2	0.02	--	4,500	--	--	< 0.01	< 0.01
Semivolatile Organic Compound								
1-Methylphenanthrene	0.4	0.4	--	190	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.04	0.04	--	190	--	--	< 0.01	< 0.01
Acenaphthene	0.3	0.3	--	28,000	--	--	< 0.01	< 0.01

TABLE M-41
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Acenapthylene	0.3	0.3	--	28,000	--	--	< 0.01	< 0.01
Anthracene	2	0.7	--	220,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	4	0.7	3.6	--	1.1E-06	1.9E-07	--	--
Benzo(a)pyrene	3	0.7	0.36	--	8.3E-06	1.9E-06	--	--
Benzo(b)fluoranthene	3	0.7	3.6	--	8.3E-07	1.9E-07	--	--
Benzo(e)pyrene	2	1	--	26,000	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	1	0.7	--	26,000	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	3	0.7	36	--	8.3E-08	1.9E-08	--	--
Benzoic acid	2	2	--	4,300,000	--	--	< 0.01	< 0.01
Butylbenzylphthalate	0.08	0.08	--	210,000	--	--	< 0.01	< 0.01
Carbazole	0.9	0.6	150	--	6.0E-09	4.0E-09	--	--
Chrysene	6	0.7	360	--	1.7E-08	1.9E-09	--	--
Dibenz(a,h)anthracene	0.6	0.6	0.36	--	1.7E-06	1.7E-06	--	--
Dibenzofuran	0.2	0.2	--	3,200	--	--	< 0.01	< 0.01
Dibenzothiophene	0.2	0.2	--	--	--	--	--	--
Fluoranthene	14	0.7	--	37,000	--	--	< 0.01	< 0.01
Fluorene	0.4	0.4	--	22,000	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	1	0.7	3.6	--	2.8E-07	1.9E-07	--	--
Naphthalene	0.1	0.1	--	190	--	--	< 0.01	< 0.01
Pentachlorophenol	0.8	0.8	15	19,000	5.3E-08	5.3E-08	< 0.01	< 0.01
Perylene	0.8	0.8	--	190	--	--	< 0.01	< 0.01
Phenanthrene	4	0.7	--	190	--	--	0.02	< 0.01
Phenol	5	0.9	--	640,000	--	--	< 0.01	< 0.01
Pyrene	13	0.7	--	26,000	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.008	0.002	19	--	4.2E-10	1.1E-10	--	--
2,4'-DDE	0.003	0.0006	13	--	2.3E-10	4.6E-11	--	--
2,4'-DDT	0.03	0.002	13	800	2.3E-09	1.5E-10	< 0.01	< 0.01
4,4'-DDD	0.3	0.01	19	--	1.6E-08	5.3E-10	--	--

TABLE M-41
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
4,4'-DDE	0.03	0.007	13	--	2.3E-09	5.4E-10	--	--
4,4'-DDT	0.2	0.01	13	800	1.5E-08	7.7E-10	< 0.01	< 0.01
Aldrin	0.0005	0.0005	0.18	32	2.8E-09	2.8E-09	< 0.01	< 0.01
Alpha-chlordane	0.08	0.004	12	750	6.7E-09	3.3E-10	< 0.01	< 0.01
Dieldrin	0.006	0.006	0.19	53	3.2E-08	3.2E-08	< 0.01	< 0.01
Endrin ketone	0.004	0.004	--	320	--	--	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.002	0.002	3.2	450	6.3E-10	6.3E-10	< 0.01	< 0.01
Heptachlor	0.0007	0.0007	0.67	530	1.0E-09	1.0E-09	< 0.01	< 0.01
Heptachlor epoxide	0.006	0.003	0.33	14	1.8E-08	9.1E-09	< 0.01	< 0.01
Hexachlorobenzene	0.0004	0.0004	1.9	860	2.1E-10	2.1E-10	< 0.01	< 0.01
Mirex	0.005	0.0007	1.7	210	2.9E-09	4.1E-10	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.007	0.001	1.3	--	5.4E-09	7.7E-10	--	--
PCB-105(2,3,3',4,4')	0.003	0.0009	1.3	--	2.3E-09	6.9E-10	--	--
PCB-118(2,3',4,4',5)	0.005	0.001	1.3	--	3.8E-09	7.7E-10	--	--
PCB-126(3,3',4,4',5)	0.0006	0.0005	1.3	--	4.6E-10	3.8E-10	--	--
PCB-128(2,2',3,3',4,4')	0.003	0.0006	1.3	--	2.3E-09	4.6E-10	--	--
PCB-138(2,2',3,4,4',5')	0.01	0.003	1.3	--	7.7E-09	2.3E-09	--	--
PCB-153(2,2',4,4',5,5')	0.01	0.002	1.3	--	7.7E-09	1.5E-09	--	--
PCB-170(2,2',3,3',4,4',5)	0.007	0.0008	1.3	--	5.4E-09	6.2E-10	--	--
PCB-18(2,2',5)	0.0008	0.0005	1.3	--	6.2E-10	3.8E-10	--	--
PCB-180(2,2',3,4,4',5,5')	0.02	0.002	1.3	--	1.5E-08	1.5E-09	--	--
PCB-187(2,2',3,4',5,5',6)	0.007	0.001	1.3	--	5.4E-09	7.7E-10	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.001	0.0006	1.3	--	7.7E-10	4.6E-10	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0009	0.0006	1.3	--	6.9E-10	4.6E-10	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0003	0.0003	1.3	--	2.3E-10	2.3E-10	--	--
PCB-28(2,4,4')	0.002	0.0006	1.3	--	1.5E-09	4.6E-10	--	--
PCB-44(2,2',3,5')	0.002	0.0007	1.3	--	1.5E-09	5.4E-10	--	--
PCB-52(2,2',5,5')	0.002	0.0008	1.3	--	1.5E-09	6.2E-10	--	--
PCB-66(2,3',4,4')	0.001	0.0006	1.3	--	7.7E-10	4.6E-10	--	--

TABLE M-41
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL INDUSTRIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 INDUSTRIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-77(3,3',4,4')	0.0009	0.0006	1.3	--	6.9E-10	4.6E-10	--	--
PCB-8(2,4')	0.006	0.0008	1.3	--	4.6E-09	6.2E-10	--	--
Trans-nonachlor	0.07	0.008	12	750	5.8E-09	6.7E-10	< 0.01	< 0.01
Dioxin/Furan								
2,3,7,8-TCDD TEQ	0.000343	0.000343	0.00003	--	1.1E-05	1.1E-05	--	--
Explosive								
1,3-Dinitrobenzene	0.1	0.07	--	110	--	--	< 0.01	< 0.01
HMX	0.4	0.08	--	53,000	--	--	< 0.01	< 0.01
				TOTAL:	**3.7E-05**	**1.9E-05**	**0.21**	**0.02**

TABLE M-42
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	42,700	17,100	--	75,000	--	--	0.57	0.23
Antimony	7.1	2.0	--	30	--	--	0.24	0.07
Arsenic	27.1	12.1	0.38	21	7.1E-05	3.2E-05	1.29	0.58
Beryllium	0.84	0.23	--	150	--	--	< 0.01	< 0.01
Cadmium	20.8	3.3	9	37	2.3E-06	3.7E-07	0.56	0.09
Chromium	122	43.5	210	--	5.8E-07	2.1E-07	--	--
Hexavalent chromium	0.060	0.060	0.2	370	3.0E-07	3.0E-07	< 0.01	< 0.01
Cobalt	39.3	16.3	--	3,300	--	--	0.01	< 0.01
Copper	607	65.0	--	2,800	--	--	0.22	0.02
Mercury	18.5	0.70	--	22	--	--	0.84	0.03
Nickel	123	51.2	150	1,500	8.2E-07	3.4E-07	0.08	0.03
Selenium	3.5	0.68	--	370	--	--	< 0.01	< 0.01
Silver	4.4	0.26	--	370	--	--	0.01	< 0.01
Thallium	2.4	0.48	--	5.2	--	--	0.46	0.09
Vanadium	139	66.7	--	520	--	--	0.27	0.13
Zinc	3,010	319	--	22,000	--	--	0 14	0.01
Semivolatile Organic Compound								
1-Methylphenanthrene	0.4	0.4	--	55	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
Acenaphthene	0.3	0.3	--	2,600	--	--	< 0.01	< 0.01
Acenapthylene	0.3	0.3	--	2,600	--	--	< 0.01	< 0.01
Anthracene	2	1	--	14,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	4	1	0.56	--	7.1E-06	1.8E-06	--	--
Benzo(a)pyrene	3	1	0.056	--	5.4E-05	1.8E-05	--	--
Benzo(b)fluoranthene	3	1	0.56	--	5.4E-06	1.8E-06	--	--
Benzo(e)pyrene	2	1	--	1,500	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	1	0.9	--	1,500	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	3	1	0.61	--	4.9E-06	1.6E-06	--	--

TABLE M-42
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Benzoic acid	2	2	--	220,000	--	--	< 0.01	< 0.01
Butylbenzylphthalate	0.08	0.08	--	11,000	--	--	< 0.01	< 0.01
Carbazole	0.9	0.9	22	--	4.1E-08	4.1E-08	--	--
Chrysene	6	1	6.1	--	9.8E-07	1.6E-07	--	--
Dibenz(a,h)anthracene	0.6	0.6	0.056	--	1.1E-05	1.1E-05	--	--
Dibenzofuran	0.2	0.2	--	210	--	--	< 0.01	< 0.01
Dibenzothiophene	0.2	0.2	--	--	--	--	--	--
Fluoranthene	14	1	--	2,000	--	--	< 0.01	< 0.01
Fluorene	0.4	0.4	--	1,800	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	1	1	0.56	--	1.8E-06	1.8E-06	--	--
Naphthalene	0.1	0.1	--	55	--	--	< 0.01	< 0.01
Pentachlorophenol	0.8	0.8	2.5	1,100	3.2E-07	3.2E-07	< 0.01	< 0.01
Perylene	0.8	0.8	--	55	--	--	0.01	0.01
Phenanthrene	4	1	--	55	--	--	0.07	0.02
Phenol	0.9	0.9	--	33,000	--	--	< 0.01	< 0.01
Pyrene	13	1	--	1,500	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.008	0.002	2.4	--	3.3E-09	8.3E-10	--	--
2,4'-DDE	0.003	0.0006	1.7	--	1.8E-09	3.5E-10	--	--
2,4'-DDT	0.03	0.002	1.7	35	1.8E-08	1.2E-09	< 0.01	< 0.01
4,4'-DDD	0.3	0.02	2.4	--	1.3E-07	8.3E-09	--	--
4,4'-DDE	0.03	0.006	1.7	--	1.8E-08	3.5E-09	--	--
4,4'-DDT	0.2	0.02	1.7	35	1.2E-07	1.2E-08	< 0.01	< 0.01
Aldrin	0.0005	0.0005	0.026	1.6	1.9E-08	1.9E-08	< 0.01	< 0.01
Alpha-chlordane	0.08	0.007	1.6	33	5.0E-08	4.4E-09	< 0.01	< 0.01
Dieldrin	0.006	0.002	0.028	2.7	2.1E-07	7.1E-08	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.002	0.0009	0.42	20	4.8E-09	2.1E-09	< 0.01	< 0.01
Heptachlor	0.0007	0.0007	0.099	27	7.1E-09	7.1E-09	< 0.01	< 0.01
Heptachlor epoxide	0.006	0.0008	0.049	0.71	1.2E-07	1.6E-08	< 0.01	< 0.01

TABLE M-42
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FEET BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Hexachlorobenzene	0.0004	0.0004	0.28	44	1.4E-09	1.4E-09	< 0.01	< 0.01
Mirex	0.005	0.0007	0.25	11	2.0E-08	2.8E-09	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.007	0.001	0.2	--	3.5E-08	5.0E-09	--	--
PCB-105(2,3,3',4,4')	0.003	0.0009	0.2	--	1.5E-08	4.5E-09	--	--
PCB-118(2,3',4,4',5)	0.005	0.001	0.2	--	2.5E-08	5.0E-09	--	--
PCB-126(3,3',4,4',5)	0.0006	0.0005	0.2	--	3.0E-09	2.5E-09	--	--
PCB-128(2,2',3,3',4,4')	0.003	0.0006	0.2	--	1.5E-08	3.0E-09	--	--
PCB-138(2,2',3,4,4',5')	0.01	0.003	0.2	--	5.0E-08	1.5E-08	--	--
PCB-153(2,2',4,4',5,5')	0.01	0.002	0.2	--	5.0E-08	1.0E-08	--	--
PCB-170(2,2',3,3',4,4',5)	0.007	0.0008	0.2	--	3.5E-08	4.0E-09	--	--
PCB-18(2,2',5)	0.0008	0.0005	0.2	--	4.0E-09	2.5E-09	--	--
PCB-180(2,2',3,4,4',5,5')	0.02	0.002	0.2	--	1.0E-07	1.0E-08	--	--
PCB-187(2,2',3,4',5,5',6)	0.007	0.001	0.2	--	3.5E-08	5.0E-09	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.001	0.0006	0.2	--	5.0E-09	3.0E-09	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0009	0.0006	0.2	--	4.5E-09	3.0E-09	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0003	0.0003	0.2	--	1.5E-09	1.5E-09	--	--
PCB-28(2,4,4')	0.002	0.0006	0.2	--	1.0E-08	3.0E-09	--	--
PCB-44(2,2',3,5')	0.002	0.0007	0.2	--	1.0E-08	3.5E-09	--	--
PCB-52(2,2',5,5')	0.002	0.0008	0.2	--	1.0E-08	4.0E-09	--	--
PCB-66(2,3',4,4')	0.001	0.0006	0.2	--	5.0E-09	3.0E-09	--	--
PCB-77(3,3',4,4')	0.0009	0.0006	0.2	--	4.5E-09	3.0E-09	--	--
PCB-8(2,4')	0.006	0.0008	0.2	--	3.0E-08	4.0E-09	--	--
Trans-nonachlor	0.07	0.008	1.6	33	4.4E-08	5.0E-09	< 0.01	< 0.01
Dioxin/Furan								
2,3,7,8-TCDD TEQ	0.000343	0.000343	0.0000038	--	9.0E-05	9.0E-05	--	--
Explosive								
1,3-Dinitrobenzene	0.1	0.09	--	5.5	--	--	0.02	0.02
				TOTAL:	**2.5E-04**	**1.6E-04**	**4.79**	**1.33**

TABLE M-43
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Metal								
Aluminum	42,700	17,600	--	75,000	--	--	0.57	0.23
Antimony	7.1	1.6	--	30	--	--	0.24	0.05
Arsenic	37.0	10.7	0.38	21	9.7E-05	2.8E-05	1.76	0.51
Barium	546	181	--	5,200	--	--	0.11	0.03
Beryllium	0.84	0.13	--	150	--	--	< 0.01	< 0.01
Cadmium	20.8	1.1	9	37	2.3E-06	1.2E-07	0.56	0.03
Chromium	122	47.5	210	--	5.8E-07	2.3E-07	--	--
Hexavalent chromium	0.060	0.060	0.2	370	3.0E-07	3.0E-07	< 0.01	< 0.01
Cobalt	39.3	17.4	--	3,300	--	--	0.01	< 0.01
Copper	607	53.6	--	2,800	--	--	0.22	0.02
Mercury	18.5	0.35	--	22	--	--	0.84	0.02
Molybdenum	12.9	1.3	--	370	--	--	0.03	< 0.01
Nickel	123	58.6	150	1,500	8.2E-07	3.9E-07	0.08	0.04
Selenium	4.8	0.73	--	370	--	--	0.01	< 0.01
Silver	4.4	0.21	--	370	--	--	0.01	< 0.01
Thallium	2.4	0.51	--	5.2	--	--	0.46	0.10
Vanadium	163	73.4	--	520	--	--	0.31	0.14
Zinc	3,010	217	--	22,000	--	--	0.14	< 0.01
Volatile Organic Compound								
2-Butanone	0.7	0.05	--	6,900	--	--	< 0.01	< 0.01
Acetone	0.3	0.1	--	1,400	--	--	< 0.01	< 0.01
Carbon disulfide	0.3	0.02	--	350	--	--	< 0.01	< 0.01
Ethylbenzene	0.2	0.02	--	1,400	--	--	< 0.01	< 0.01
Xylene	0.2	0.02	--	1,300	--	--	< 0.01	< 0.01
Semivolatile Organic Compound								
1-Methylphenanthrene	0.4	0.4	--	55	--	--	< 0.01	< 0.01
2,6-Dimethylnaphthalene	0.04	0.04	--	55	--	--	< 0.01	< 0.01
Acenaphthene	0.3	0.3	--	2,600	--	--	< 0.01	< 0.01

TABLE M-43
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
Acenapthylene	0.3	0.3	--	2,600	--	--	< 0.01	< 0.01
Anthracene	2	0.7	--	14,000	--	--	< 0.01	< 0.01
Benzo(a)anthracene	4	0.7	0.56	--	7.1E-06	1.3E-06	--	--
Benzo(a)pyrene	3	0.7	0.056	--	5.4E-05	1.3E-05	--	--
Benzo(b)fluoranthene	3	0.7	0.56	--	5.4E-06	1.3E-06	--	--
Benzo(e)pyrene	2	1	--	1,500	--	--	< 0.01	< 0.01
Benzo(g,h,i)perylene	1	0.7	--	1,500	--	--	< 0.01	< 0.01
Benzo(k)fluoranthene	3	0.7	0.61	--	4.9E-06	1.1E-06	--	--
Benzoic acid	2	2	--	220,000	--	--	< 0.01	< 0.01
Butylbenzylphthalate	0.08	0.08	--	11,000	--	--	< 0.01	< 0.01
Carbazole	0.9	0.6	22	--	4.1E-08	2.7E-08	--	--
Chrysene	6	0.7	6.1	--	9.8E-07	1.1E-07	--	--
Dibenz(a,h)anthracene	0.6	0.6	0.056	--	1.1E-05	1.1E-05	--	--
Dibenzofuran	0.2	0.2	--	210	--	--	< 0.01	< 0.01
Dibenzothiophene	0.2	0.2	--	--	--	--	--	--
Fluoranthene	14	0.7	--	2,000	--	--	< 0.01	< 0.01
Fluorene	0.4	0.4	--	1,800	--	--	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	1	0.7	0.56	--	1.8E-06	1.3E-06	--	--
Naphthalene	0.1	0.1	--	55	--	--	< 0.01	< 0.01
Pentachlorophenol	0.8	0.8	2.5	1,100	3.2E-07	3.2E-07	< 0.01	< 0.01
Perylene	0.8	0.8	--	55	--	--	0.01	0.01
Phenanthrene	4	0.7	--	55	--	--	0.07	0.01
Phenol	5	0.9	--	33,000	--	--	< 0.01	< 0.01
Pyrene	13	0.7	--	1,500	--	--	< 0.01	< 0.01
Pesticide/Polychlorinated Biphenyl								
2,4'-DDD	0.008	0.002	2.4	--	3.3E-09	8.3E-10	--	--
2,4'-DDE	0.003	0.0006	1.7	--	1.8E-09	3.5E-10	--	--
2,4'-DDT	0.03	0.002	1.7	35	1.8E-08	1.2E-09	< 0.01	< 0.01
4,4'-DDD	0.3	0.01	2.4	--	1.3E-07	4.2E-09	--	--

TABLE M-43
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
4,4'-DDE	0.03	0.007	1.7	--	1.8E-08	4.1E-09	--	--
4,4'-DDT	0.2	0.01	1.7	35	1.2E-07	5.9E-09	< 0.01	< 0.01
Aldrin	0.0005	0.0005	0.026	1.6	1.9E-08	1.9E-08	< 0.01	< 0.01
Alpha-chlordane	0.08	0.004	1.6	33	5.0E-08	2.5E-09	< 0.01	< 0.01
Dieldrin	0.006	0.006	0.028	2.7	2.1E-07	2.1E-07	< 0.01	< 0.01
Endrin ketone	0.004	0.004	--	16	--	--	< 0.01	< 0.01
Gamma-BHC (Lindane)	0.002	0.002	0.42	20	4.8E-09	4.8E-09	< 0.01	< 0.01
Heptachlor	0.0007	0.0007	0.099	27	7.1E-09	7.1E-09	< 0.01	< 0.01
Heptachlor epoxide	0.006	0.003	0.049	0.71	1.2E-07	6.1E-08	< 0.01	< 0.01
Hexachlorobenzene	0.0004	0.0004	0.28	44	1.4E-09	1.4E-09	< 0.01	< 0.01
Mirex	0.005	0.0007	0.25	11	2.0E-08	2.8E-09	< 0.01	< 0.01
PCB-101(2,2',3,5,5')	0.007	0.001	0.2	--	3.5E-08	5.0E-09	--	--
PCB-105(2,3,3',4,4')	0.003	0.0009	0.2	--	1.5E-08	4.5E-09	--	--
PCB-118(2,3',4,4',5)	0.005	0.001	0.2	--	2.5E-08	5.0E-09	--	--
PCB-126(3,3',4,4',5)	0.0006	0.0005	0.2	--	3.0E-09	2.5E-09	--	--
PCB-128(2,2',3,3',4,4')	0.003	0.0006	0.2	--	1.5E-08	3.0E-09	--	--
PCB-138(2,2',3,4,4',5')	0.01	0.003	0.2	--	5.0E-08	1.5E-08	--	--
PCB-153(2,2',4,4',5,5')	0.01	0.002	0.2	--	5.0E-08	1.0E-08	--	--
PCB-170(2,2',3,3',4,4',5)	0.007	0.0008	0.2	--	3.5E-08	4.0E-09	--	--
PCB-18(2,2',5)	0.0008	0.0005	0.2	--	4.0E-09	2.5E-09	--	--
PCB-180(2,2',3,4,4',5,5')	0.02	0.002	0.2	--	1.0E-07	1.0E-08	--	--
PCB-187(2,2',3,4',5,5',6)	0.007	0.001	0.2	--	3.5E-08	5.0E-09	--	--
PCB-195(2,2',3,3',4,4',5,6)	0.001	0.0006	0.2	--	5.0E-09	3.0E-09	--	--
PCB-206(2,2',3,3',4,4',5,5',6)	0.0009	0.0006	0.2	--	4.5E-09	3.0E-09	--	--
PCB-209(2,2',3,3',4,4',5,5',6,6')	0.0003	0.0003	0.2	--	1.5E-09	1.5E-09	--	--
PCB-28(2,4,4')	0.002	0.0006	0.2	--	1.0E-08	3.0E-09	--	--
PCB-44(2,2',3,5')	0.002	0.0007	0.2	--	1.0E-08	3.5E-09	--	--
PCB-52(2,2',5,5')	0.002	0.0008	0.2	--	1.0E-08	4.0E-09	--	--
PCB-66(2,3',4,4')	0.001	0.0006	0.2	--	5.0E-09	3.0E-09	--	--

TABLE M-43
SITE 11 - WOOD HOGGER
CANCER RISK AND HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	EXPOSURE POINT CONCENTRATION (mg/kg)		1998 RESIDENTIAL PRG		CANCER RISK		HAZARD QUOTIENT	
	MAX	RME	CANCER	NONCANCER	MAX	RME	MAX	RME
PCB-77(3,3',4,4')	0.0009	0.0006	0.2	--	4.5E-09	3.0E-09	--	--
PCB-8(2,4')	0.006	0.0008	0.2	--	3.0E-08	4.0E-09	--	--
Trans-nonachlor	0.07	0.008	1.6	33	4.4E-08	5.0E-09	< 0.01	< 0.01
Dioxin/Furan								
2,3,7,8-TCDD TEQ	0.000343	0.000343	0.0000038	--	9.0E-05	9.0E-05	--	--
Explosive								
1,3-Dinitrobenzene	0.1	0.07	--	5.5	--	--	0.02	0.01
HMX	0.4	0.08	--	2700	--	--	< 0.01	< 0.01
				TOTAL:	**2.8E-04**	**1.5E-04**	**5.46**	**1.22**

TABLE M-44
SITE 11, WOOD HOGGER
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Metal											
Aluminum			0.23								0.07
Antimony		0.07						0.58			
Arsenic	0.58										< 0.01
Beryllium											
Cadmium				0.09							< 0.01
Hexavalent chromium											
Cobalt		< 0.01					< 0.01				
Copper					0.02						
Mercury			0.03								
Nickel									0.03		
Selenium			< 0.01			< 0.01		< 0.01			
Silver								< 0.01			
Thallium								0.09			
Vanadium											0.13
Zinc		0.01									
Semivolatile Organic Compound											
1-Methylphenanthrene											< 0.01
2,6-Dimethylnaphthalene											< 0.01
Acenaphthene						< 0.01					
Acenaphthylene											< 0.01
Anthracene											< 0.01
Benzo(e)pyrene											< 0.01
Benzo(g,h,i)perylene											< 0.01
Benzoic acid											< 0.01
Butylbenzylphthalate						< 0.01					
Dibenzofuran											< 0.01
Fluoranthene		< 0.01		< 0.01		< 0.01					
Fluorene		< 0.01									

TABLE M-44
SITE 11, WOOD HOGGER
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SURFACE SOIL (0 TO 0.5 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Naphthalene									< 0.01		
Pentachlorophenol				< 0.01		< 0.01					
Perylene											0.01
Phenanthrene											0.02
Phenol										< 0.01	
Pyrene				< 0.01							
Pesticide/Polychlorinated Biphenyl											
2,4'-DDT						< 0.01					
4,4'-DDT						< 0.01					
Aldrin						< 0.01					
alpha-Chlordane						< 0.01					
Dieldrin						< 0.01					
gamma-BHC (Lindane)				< 0.01		< 0.01					
Heptachlor						< 0.01					
Heptachlor epoxide						< 0.01					
Hexachlorobenzene						< 0.01					
Mirex						< 0.01					< 0.01
Trans-nonachlor						< 0.01					
Total	**0.58**	**0.08**	**0.26**	**0.09**	**0.02**	**< 0.01**	**< 0.01**	**0.67**	**0.03**	**< 0.01**	**0.23**

TABLE M-45
SITE 11, WOOD HOGGER
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Metal											
Aluminum			0.23								0.05
Antimony		0.05									
Arsenic	0.51							0.51			
Barium	0.03										< 0.01
Beryllium											
Cadmium				0.03							< 0.01
Hexavalent chromium											
Cobalt		< 0.01					< 0.01				
Copper					0.02						
Mercury			0.02								
Molybdenum				< 0.01							
Nickel									0.04		
Selenium			< 0.01			< 0.01		< 0.01			
Silver								< 0.01			
Thallium								0.10			
Vanadium											0.14
Zinc		< 0.01									
Volatile Organic Compound											
Acetone				< 0.01		< 0.01					
2-Butanone										< 0.01	
Carbon disulfide			< 0.01							< 0.01	
Ethylbenzene				< 0.01		< 0.01					
Xylene			< 0.01						< 0.01		< 0.01
Semivolatile Organic Compound											
1-Methylphenanthrene											< 0.01
2,6-Dimethylnaphthalene											< 0.01
Acenaphthene						< 0.01					
Acenaphthylene											< 0.01
Anthracene											< 0.01

TABLE M-45
SITE 11, WOOD HOGGER
SEGREGATED HAZARD INDEX
FROM POTENTIAL RESIDENTIAL EXPOSURE TO COPCS IN SUBSURFACE SOIL (0 TO 10 FOOT BGS)
NWS CONCORD, TIDAL AREA SITES

Chemical of Potential Concern	CV	Blood	CNS/ PNS	Kidney	GI	Liver	Resp	Skin	Body Wt	Repro	Other
Benzo(e)pyrene											< 0.01
Benzo(g,h,i)perylene											< 0.01
Benzoic acid											< 0.01
Butylbenzylphthalate						< 0.01					
Dibenzofuran											< 0.01
Fluoranthene		< 0.01		< 0.01		< 0.01					
Fluorene		< 0.01									
Naphthalene									< 0.01		
Pentachlorophenol				< 0.01		< 0.01					
Perylene											0.01
Phenanthrene											0.01
Phenol										< 0.01	
Pyrene				< 0.01							
Pesticide/Polychlorinated Biphenyl											
2,4'-DDT						< 0.01					
4,4'-DDT						< 0.01					
Aldrin						< 0.01					
alpha-Chlordane						< 0.01					
Dieldrin						< 0.01					
Endrin ketone			< 0.01			< 0.01					
gamma-BHC (Lindane)				< 0.01		< 0.01					
Heptachlor						< 0.01					
Heptachlor epoxide						< 0.01					
Hexachlorobenzene						< 0.01					
Mirex						< 0.01					< 0.01
Trans-nonachlor						< 0.01					
Explosive											
1,3-Dinitrobenzene											0.01
HMX						< 0.01					< 0.01
Total	**0.54**	**0.05**	**0.25**	**0.03**	**0.02**	**< 0.01**	**< 0.01**	**0.61**	**0.04**	**< 0.01**	**0.22**

TABLE M-46
SITE 11 - WOOD HOGGER
CANCER RISK FROM DERMAL CONTACT WITH GROUNDWATER
INDUSTRIAL WORKER
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

CANCER RISK = LADD x Slope Factor

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor $(mg/kg\text{-}day)^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Arsenic	0.0030	0.012	1.0E-03	IRIS	1.5E+00	2.5E-08	3.7E-08	9.9E-08	1.5E-07
Manganese	0.34	2.0	1.0E-03	--	--	2.8E-06	--	1.7E-05	--
Total							***3.7E-08***		***1.5E-07***

TABLE M-47
SITE 11 - WOOD HOGGER
HAZARD INDEX FROM DERMAL CONTACT WITH SURFACE WATER
INDUSTRIAL WORKER
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{ADD}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Arsenic	0.0030	0.012	1.0E-03	IRIS	3.0E-04	7.0E-08	2.3E-04	2.8E-07	9.3E-04
Manganese	0.34	2.0	1.0E-03	IRIS	4.7E-02	7.9E-06	1.7E-04	4.6E-05	9.9E-04
Total							***4.0E-04***		***1.9E-03***

TABLE M-48
SITE 11 - WOOD HOGGER
CANCER RISK FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT ADULT
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

CANCER RISK = LADD x Slope Factor

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor (mg/kg-day)$^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Arsenic	0.0030	0.012	1.0E-03	IRIS	1.5E+00	2.1E-08	3.1E-08	8.4E-08	1.3E-07
Manganese	0.34	2.0	1.0E-03	--	--	2.4E-06	--	1.4E-05	--
Total							***3.1E-08***		***1.3E-07***

TABLE M-49
HAZARD INDEX FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT ADULT
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{ADD}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Arsenic	0.0030	0.012	1.0E-03	IRIS	3.0E-04	6.1E-08	2.0E-04	2.4E-07	8.1E-04
Manganese	0.34	2.0	1.0E-03	IRIS	4.7E-02	6.9E-06	1.5E-04	4.1E-05	8.7E-04
Total							***3.5E-04***		***1.7E-03***

TABLE M-50
SITE 11 - WOOD HOGGER
CANCER RISK FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT CHILD
NWS CONCORD, TIDAL AREA SITES

$$\text{LIFETIME AVERAGE DAILY DOSE (LADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

CANCER RISK = LADD x Slope Factor

Chemical of Potential Concern (COPC)	RME Concentration (C) (mg/L)	MAX Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		RME		MAX	
				Source	Slope Factor $(mg/kg\text{-}day)^{-1}$	LADD (mg/kg-day)	Cancer Risk (unitless)	LADD (mg/kg-day)	Cancer Risk (unitless)
Metal									
Arsenic	0.0030	0.012	1.0E-03	IRIS	1.5E+00	1.4E-08	2.1E-08	5.7E-08	8.5E-08
Manganese	0.34	2.0	1.0E-03	--	--	1.6E-06	--	9.4E-06	--
Total							***2.1E-08***		***8.5E-08***

TABLE M-51
SITE 11 - WOOD HOGGER
HAZARD INDEX FROM DERMAL CONTACT WITH SURFACE WATER
RESIDENT CHILD
NWS CONCORD, TIDAL AREA SITES

$$\text{AVERAGE DAILY DOSE (ADD)} = \frac{C \times SA \times Kp \times ET \times EF \times ED \times CF}{BW \times AT}$$

$$\text{HAZARD QUOTIENT} = \frac{\text{ADD}}{\text{Reference Dose}}$$

Chemical of Potential Concern (COPC)	CTE Concentration (C) (mg/L)	RME Concentration (C) (mg/L)	Permeability Constant (Kp) (cm/hr)	Toxicity Value		CTE		RME	
				Source	Reference Dose (mg/kg-day)	ADD (mg/kg-day)	Hazard Quotient (unitless)	ADD (mg/kg-day)	Hazard Quotient (unitless)
Metal									
Arsenic	0.0030	0.0120	1.0E-03	IRIS	3.0E-04	1.7E-07	5.5E-04	6.6E-07	2.2E-03
Manganese	0.34	2.00	1.0E-03	IRIS	4.7E-02	1.9E-05	4.0E-04	1.1E-04	2.3E-03
Total							***9.5E-04***		***4.5E-03***

APPENDIX M

STATISTICAL DATA SUMMARIES AND METHODS FOR CALCULATING 95TH UPPER CONFIDENCE LIMITS

Statistical summaries of tidal area site soil and surface water data are presented in this appendix. The statistical summaries list maximum, minimum, average, and 95th upper confidence limit (UCL_{95}) on the mean values). Maximum and minimum sample quantitation limits are also presented. Average and UCL_{95} values include both detected chemical concentrations and one-half the sample quantitation limit for undetected chemicals.

The Tidal Area site statistical summaries include all detected compounds. With the exception of background metals, all the detected compounds are evaluated in this HHRA.

Methods for calculating the UCL_{95} for normal and lognormal data distributions are described in the following subsections.

1.0 DATA SET PREPARATION

For application of the procedures described in this appendix, "data set" refers to the set of analytical results selected to derive a concentration term for a defined exposure area. For the purposes of this report, the data sets used for the analysis is identified in Section 7.1.3 of this report. Before the concentration terms could be estimated, most of the data sets required special preparation to account for nondetectable results and duplicate samples. For laboratory analyses reported as not detected, half the sample quantitation limit (SQL) was substituted as a proxy concentration.

2.0 DETERMINING THE DATA SET DISTRIBUTION TYPE

Two goodness-of-fit tests were used to evaluate the data-set distribution type of all data sets with four or more detected results: Shapiro and Wilk's *W* test for data sets of between 4 and 50 samples, and D'Agostino's test for data sets with more than 50 samples (Gilbert 1987). The assumption of normality was first tested at a 0.05 probability level. If the assumption of normality was rejected, the distribution type was assumed to be lognormal. The data sets with three or fewer detected results were assumed to be normal. The *W* test and D'Agostino's test are described in the following text.

For sets of between 4 and 50 samples (and with at least four detected results), the *W* test was used to test the null hypothesis that a sample population was normally distributed as follows:

1. The denominator *d* of the *W* test statistic for *n* values was computed:

$$d = \sum_{i=1}^{n} (x_i - \bar{x})^2$$

2. The data were ranked from minimum to maximum to obtain the sample order statistics:

$$x_1 \leq x_2 \leq \ldots \leq x_k \ldots \leq x_n$$

3. k was computed where:

$k = n/2$ if n is even

$k = (n\ 1)/2$ if n is odd

4. Coefficients $a_1, a_2, \ldots a_k$ for the n observations were identified in Table A-6 by Gilbert (1987).

5. The W test statistic was computed:

$$W = \frac{1}{d}\left[\sum_{i=1}^{k} a_i \left(x_{[n-(i-1)]} - x_{[i]} \right)\right]^2$$

If W was less than the quantile for the specified level of significance, the null hypothesis that the population was normally distributed was rejected. The quantiles are listed in Table A-7 in Gilbert (1987).

Where the number of samples exceeded 50 (and at least four detected results were in the data set), D'Agostino's test was used to test the null hypothesis that a sample population was normally distributed, as follows:

1. The data were ranked from minimum to maximum to obtain the sample order statistic:

$$x_{[1]} \leq x_{[2]} \leq \ldots \leq x_{[k]} \ldots \leq x_{[n]}$$

2. The D statistic was computed:

$$D = \frac{\sum_{i=1}^{n} \left[i - \frac{1}{2}(n + 1) \right] x_{[i]}}{n^2 s}$$

where

$$s = \left[\frac{1}{n} \sum_{i=1}^{n} (x_i - \bar{x})^2 \right]^{1/2}$$

3. The D statistic was transformed to the Y statistic:

$$Y = \frac{D - 0.28209479}{0.02998598 / \sqrt{n}}$$

If n is large and the data are drawn from a normal distribution, the expected value of Y is zero. For nonnormal distributions, Y will tend to be either less than or greater than zero, depending on the particular distribution, necessitating a two-tailed test (step 4).

4. The null hypothesis is rejected at the α significance level if Y is less than the $\alpha/2$ quantile or greater than the $1 - \alpha/2$ quantile of the distribution Y. These quantiles are listed in Table A-8 in Gilbert (1987) for selected values of n between 50 and 1,000.

3.0 CALCULATING THE CONCENTRATION TERM

After the data sets were prepared and the data set distribution type was determined as described in Sections 1.0 and 2.0, a soil concentration term was calculated for each contaminant of potential concern. For the human health risk assessment, the lesser of the UCL_{95} and the maximum detected concentration was used as the reasonable maximum exposure (RME) case.

In some cases, the calculated UCL_{95} was greater than the maximum detected concentration in the data set. This occurred primarily when the data sets were characterized by one or more of the following conditions: (1) most samples in the data set were nondetects, (2) the maximum detected concentration was less than or at the lower end of the range of reported SQLs, and (3) the coefficient of variation was large. For example, for data sets where most samples were nondetects, half the SQL was substituted for the nondetects. In cases where half the SQL was greater than the maximum detected concentration for many values in the data set, the calculated mean or UCL_{95} exceeded the maximum detected concentration. As a second example, the arithmetic mean and UCL_{95} of a lognormal data set are dependent on the standard deviation (see Section 3.2). For data sets where the standard deviation was relatively large, the mean or UCL_{95} sometimes exceeded the maximum detected concentration. For these cases, the maximum detected concentration was used as the soil concentration term for the RME case.

The equations for calculating the concentration terms are dependent on the data-set distribution type. These equations are presented in Section 3.1 for normally distributed data sets, and in Section 3.2 for lognormally distributed data sets.

3.1 NORMALLY DISTRIBUTED DATA SETS

For normally distributed data sets and data sets where the distribution type was not tested (that is, small data sets with three or fewer samples and larger data sets with three of fewer detected results), the UCL_{95} of the arithmetic mean was calculated as follows:

1. The mean, $\bar{x}$, and standard deviation, s, were calculated:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \quad \text{and} \quad s = \sqrt{\frac{\sum_{i=1}^{n} \left(x_i - \bar{x} \right)^2}{n-1}}$$

where n is the total number of data points in the data set and x_i is an individual data point.

2. The UCL_{95} was then calculated:

$$UCL_{95} = \bar{x} + t_{n-1,95\%} \frac{s}{\sqrt{n}}$$

where t is the Student statistic. The Student statistic is a value dependent on n and the selected confidence level. For this assessment, the confidence level was 95 percent. Values of t are listed in Table A-2 by Gilbert (1987).

3.2 LOGNORMALLY DISTRIBUTED DATA SETS

For lognormally distributed data sets, the UCL_{95} of the arithmetic mean was calculated in a multistep process, as follows.

1. The data set was transformed, by finding the logarithm of each value, x_i

$$y_i = \ln x_i$$

2. The mean, $\bar{y}$, and standard deviation, s_y, were calculated:

$$\bar{y} = \frac{\sum_{i=1}^{n} y_i}{n} \quad \text{and} \quad s_y = \sqrt{\frac{\sum_{i=1}^{n} \left(y_i - \bar{y} \right)^2}{n-1}}$$

3. The UCL_{95} was calculated:

$$UCL_{95} = \exp\left(\bar{y} + 0.5\, s_y^2 + \frac{s_y H}{\sqrt{n-1}} \right)$$

where H is the H statistic. The H statistic is a value dependent on s_y, n, and the selected confidence level. For this assessment, the confidence level was 95 percent. Values of H are listed in Tables A10 through A13 by Gilbert (1987).

REFERENCES

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. New York. Van Nostrand Reinhold Company.

U.S. Environmental Protection Agency (EPA). 1989. "Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual. Part A: Baseline Risk Assessment." EPA/540/1-89/002. September.

EPA. 1992. "Supplemental Guidance to RAGS: Calculating the Concentration Term." Publication 0285.7 081. May.

APPENDIX N

ECOLOGICAL STATISTICAL SUMMARY TABLES

LIST OF TABLES

Table

N-1-A STATISTICAL SUMMARY OF SOIL AND SEDIMENT BULK CHEMISTRY RESULTS, LANDFILL TERRESTRIAL

N-1-B STATISTICAL SUMMARY OF SURFACE WATER RESULTS, TIDAL AREA LANDFILL (SITE 1)

N-2-A STATISTICAL SUMMARY OF SOIL AND SEDIMENT BULK CHEMISTRY RESULTS, R AREA TERRESTRIAL

N-2-B STATISTICAL SUMMARY OF SOIL AND SEDIMENT BULK CHEMISTRY RESULTS, R AREA TERRESTRIAL AND AQUATIC

N-2-C STATISTICAL SUMMARY OF SURFACE WATER RESULTS, R AREA DISPOSAL SITE (SITE 9)

N-3-A STATISTICAL SUMMARY OF SOIL AND SEDIMENT BULK CHEMISTRY RESULTS, FROID AND TAYLOR TERRESTRIAL

N-3-B STATISTICAL SUMMARY OF SOIL AND SEDIMENT BULK CHEMISTRY RESULTS, FROID AND TAYLOR AQUATIC

N-3-C STATISTICAL SUMMARY OF SURFACE WATER RESULTS, FROID AND TAYLOR ROADS (SITE 9)

N-4-A STATISTICAL SUMMARY OF SOIL AND SEDIMENT BULK CHEMISTRY RESULTS, WOOD HOGGER TERRESTRIAL

N-4-B STATISTICAL SUMMARY OF SURFACE WATER RESULTS, WOOD HOGGER SITE (SITE 11)

N-5-A STATISTICAL SUMMARY OF SOIL AND SEDIMENT BULK CHEMISTRY RESULTS, NORTH OTTER SLUICE AQUATIC

N-5-B STATISTICAL SUMMARY OF SURFACE WATER RESULTS, NORTH OTTER SLUICE

N-6-A STATISTICAL SUMMARY OF SOIL AND SEDIMENT BULK CHEMISTRY RESULTS, SOUTH OTTER SLUICE AQUATIC

N-6-B STATISTICAL SUMMARY OF SURFACE WATER RESULTS, SOUTH OTTER SLUICE

Table N-1-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Landfill Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/KG	12,000	410,000	110,000	400,000	76,000	410,000	2,500,000	22,000	110,000	12,000,000,000	140,000	24/24	*	*	*	*
HEXAVALENT CHROMIUM	HEXAVALENT CHROMIUM	UG/KG	3.5	3.5	3.5	0	3.5	3.5	3.5	0	0	0	144,000	0/1	*	*	*	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	1,3-DINITROBENZENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	2,4,6-TRINITROTOLUENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	2-NITROTOLUENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	3-NITROTOLUENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	4-NITROTOLUENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	HMX	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	NITROBENZENE	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	RDX	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
	TETRYL	UG/KG	60	60	60	0	60	60	1,400	0	0	0	60	0/24	*	*	*	*
LOW LEVEL PESTICIDES AND PCBs	2,4'-DDD	UG/KG	0.1	12	3	12	1	12	23	1	4	16	6	5/8	*	*	*	*
	2,4'-DDE	UG/KG	0.1	0.9	0.3	0.8	0.2	0.1	3	0.1	0.3	0.09	0.5	2/8	*	*	*	*
	2,4'-DDT	UG/KG	0.1	1	0.2	0.9	0.1	0.1	2	0.1	0.3	0.09	0.4	1/8	*	*	*	*
	4,4'-DDD	UG/KG	0.1	27	6	27	2	27	47	3	9	84	12	5/8	*	4	1	*
	4,4'-DDE	UG/KG	0.1	6	2	6	2	6	19	0.8	2	5	4	5/8	*	3	0	*
	4,4'-DDT	UG/KG	0.1	2	0.7	2	0.5	2	5	0.2	0.7	0.5	1	4/8	*	2	0	*
	ALDRIN	UG/KG	0.1	2	0.5	2	0.1	0.1	4	0.2	0.6	0.4	0.8	2/8	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	0.1	5	2	5	2	2	17	0.7	2	4	4	5/8	*	*	*	*
	DIELDRIN	UG/KG	0.1	2	0.6	2	0.2	0.1	5	0.3	0.8	0.7	1	3/8	0	3	0	*
	GAMMA-BHC (LINDANE)	UG/KG	0.1	0.3	0.2	0.2	0.1	0.1	1	0.03	0.08	0.006	0.2	0/8	*	*	*	*
	HEPTACHLOR	UG/KG	0.1	0.8	0.3	0.7	0.2	0.8	2	0.09	0.2	0.06	0.5	2/8	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.1	0.3	0.2	0.2	0.1	0.1	1	0.03	0.08	0.006	0.2	0/8	*	*	*	*
	HEXACHLOROBENZENE	UG/KG	0.1	2	0.5	2	0.1	0.1	4	0.2	0.7	0.5	0.9	2/8	0	*	*	*
	MIREX	UG/KG	0.1	0.5	0.2	0.4	0.1	0.1	2	0.06	0.2	0.03	0.3	2/8	*	*	*	*
	PCB-101 (2,2',3,5,5')	UG/KG	0.1	2	0.7	2	0.5	2	6	0.3	0.7	0.6	1	5/8	*	*	*	*
	PCB-105 (2,3,3',4,4')	UG/KG	0.1	2	0.6	2	0.4	2	4	0.2	0.6	0.3	0.9	5/8	*	*	*	*
	PCB-118 (2,3',4,4',5)	UG/KG	0.1	4	1	4	0.5	4	9	0.5	1	2	2	5/8	*	*	*	*
	PCB-126 (3,3',4,4',5)	UG/KG	0.1	0.3	0.2	0.2	0.1	0.1	1	0.03	0.08	0.006	0.2	0/8	*	*	*	*
	PCB-128 (2,2',3,3',4,4')	UG/KG	0.1	0.8	0.3	0.7	0.1	0.1	2	0.1	0.3	0.09	0.5	2/8	*	*	*	*
	PCB-138 (2,2',3,4,4',5')	UG/KG	0.1	3	1	3	0.8	3	10	0.4	1	2	2	5/8	*	*	*	*
	PCB-153 (2,2',4,4',5,5')	UG/KG	0.1	2	0.9	2	0.7	2	7	0.3	0.8	0.7	1	5/8	*	*	*	*
	PCB-170 (2,2',3,3',4,4',5)	UG/KG	0.1	0.5	0.2	0.4	0.1	0.1	2	0.05	0.2	0.02	0.3	1/8	*	*	*	*
	PCB-18 (2,2',5)	UG/KG	0.1	2	0.5	2	0.3	0.1	4	0.3	0.8	0.6	1	4/8	*	*	*	*
	PCB-180 (2,2',3,4,4',5,5')	UG/KG	0.1	2	0.7	1	0.6	2	5	0.2	0.5	0.3	1	5/8	*	*	*	*
	PCB-187 (2,2',3,4',5,5',6)	UG/KG	0.1	0.7	0.3	0.6	0.2	0.7	3	0.09	0.2	0.06	0.5	5/8	*	*	*	*
	PCB-195 (2,2',3,3',4,4',5,6)	UG/KG	0.1	0.7	0.2	0.6	0.1	0.1	2	0.07	0.2	0.04	0.4	1/8	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-1-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Landfill Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL PESTICIDES AND PCBs	PCB-206 (2,2',3,3',4,4',5,5',	UG/KG	0.1	0.5	0.3	0.4	0.2	0.5	2	0.06	0.2	0.03	0.4	3/8	*	*	*	*
	PCB-209 (2,2',3,3',4,4',5,5',6	UG/KG	0.1	0.3	0.2	0.2	0.1	0.1	1	0.03	0.08	0.006	0.2	0/8	*	*	*	*
	PCB-28 (2,4,4')	UG/KG	0.1	2	0.4	2	0.1	0.1	3	0.3	0.8	0.6	0.9	1/8	*	*	*	*
	PCB-44 (2,2',3,5')	UG/KG	0.1	3	0.5	3	0.2	0.1	4	0.3	1	0.9	1	2/8	*	*	*	*
	PCB-52 (2,2',5,5')	UG/KG	0.1	2	0.5	2	0.2	0.1	4	0.3	0.7	0.6	1	4/8	*	*	*	*
	PCB-66 (2,3',4,4')	UG/KG	0.1	4	0.9	3	0.1	0.1	7	0.5	1	2	2	2/8	*	*	*	*
	PCB-77 (3,3',4,4')	UG/KG	0.1	1	0.4	1	0.2	1	3	0.2	0.4	0.2	0.7	3/8	*	*	*	*
	PCB-8 (2,4')	UG/KG	0.1	0.3	0.2	0.2	0.1	0.1	1	0.03	0.08	0.006	0.2	0/8	*	*	*	*
	TOTAL DDTs	UG/KG	0.6	48	12	48	7	48	96	6	16	260	23	5/8	0	5	1	*
	TOTAL PCBs	UG/KG	2	33	10	31	6	33	81	4	11	120	17	6/8	0	1	0	*
	TRANS-NONACHLOR	UG/KG	0.1	4	2	4	1	4	14	0.6	2	3	3	5/8	*	*	*	*
PESTICIDES AND PCBs	4,4'-DDD	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	*	0	0	*
	4,4'-DDE	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	*	0	0	*
	4,4'-DDT	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	*	0	0	*
	ALDRIN	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	ALPHA-BHC	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	AROCLOR-1016	UG/KG	28	100	55	72	53	55	880	5	22	470	65	0/16	*	*	*	*
	AROCLOR-1221	UG/KG	55	200	110	140	110	160	1,800	11	43	1,800	130	0/16	*	*	*	*
	AROCLOR-1232	UG/KG	28	100	55	72	53	55	880	5	22	470	65	0/16	*	*	*	*
	AROCLOR-1242	UG/KG	28	100	55	72	53	55	880	5	22	470	65	0/16	*	*	*	*
	AROCLOR-1248	UG/KG	28	100	55	72	53	55	880	5	22	470	65	0/16	*	*	*	*
	AROCLOR-1254	UG/KG	28	100	55	72	53	55	880	5	22	470	65	0/16	*	*	*	*
	AROCLOR-1260	UG/KG	28	100	55	72	53	55	880	5	22	470	65	0/16	*	*	*	*
	BETA-BHC	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	DELTA-BHC	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	DIELDRIN	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	0	0	0	*
	ENDOSULFAN I	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	ENDOSULFAN II	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	*	*	*	*
	ENDOSULFAN SULFATE	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	*	0	0	*
	ENDRIN	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	*	*	*	*
	ENDRIN ALDEHYDE	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	*	*	*	*
	ENDRIN KETONE	UG/KG	3	10	6	7	5	6	88	0.5	2	5	6	0/16	*	*	*	*
	GAMMA-BHC (LINDANE)	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	GAMMA-CHLORDANE	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	HEPTACHLOR	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	1	5	3	4	3	4	44	0.3	1	1	3	0/16	*	*	*	*
	METHOXYCHLOR	UG/KG	14	49	28	35	26	40	440	3	11	110	32	0/16	*	*	*	*
	TOTAL DDTs	UG/KG	8	30	17	22	16	17	270	2	7	43	19	0/16	0	0	0	*
	TOTAL PCBs	UG/KG	220	800	440	570	420	640	7,100	43	170	30,000	520	0/16	0	0	0	*
	TOXAPHENE	UG/KG	140	490	280	350	260	400	4,400	27	110	11,000	320	0/16	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-1-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Landfill Terrestrial

			Concentration										Detection Frequency				
Analysis	Analyte	Unit	Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SULFIDE	SULFIDE	MG/KG	41	3,400	900	3,300	100	3,400	3,600	820	1,600	2,700,000	2,800	4/4	*	*	*	*
LOW LEVEL SEMIVOLATILES	1,1'-BIPHENYL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	1,2,4-TRICHLOROBENZENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	1-METHYLNAPHTHALENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	*	*	*
	1-METHYLPHENANTHRENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2,3,5-TRIMETHYLNAPHTHALENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	170	1,600	580	1,400	320	1,600	4,600	200	570	320,000	960	0/8	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	170	1,600	580	1,400	320	1,600	4,600	200	570	320,000	960	0/8	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2,6-DIMETHYLNAPHTHALENE	UG/KG	30	650	230	620	130	650	1,800	84	240	56,000	380	1/8	0	*	*	*
	2,6-DINITROTOLUENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2-CHLOROPHENOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	0	0	*
	2-METHYLPHENOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	2-NITROANILINE	UG/KG	170	1,600	580	1,400	320	1,600	4,600	200	570	320,000	960	0/8	*	*	*	*
	2-NITROPHENOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	3-NITROANILINE	UG/KG	170	1,600	580	1,400	320	1,600	4,600	200	570	320,000	960	0/8	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	170	1,600	580	1,400	320	1,600	4,600	200	570	320,000	960	0/8	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	4-CHLOROANILINE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	4-METHYLPHENOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	4-NITROANILINE	UG/KG	170	1,600	580	1,400	320	1,600	4,600	200	570	320,000	960	0/8	*	*	*	*
	4-NITROPHENOL	UG/KG	170	1,600	580	1,400	320	1,600	4,600	200	570	320,000	960	0/8	*	*	*	*
	ACENAPHTHENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	0	0	*
	ACENAPHTHYLENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	0	0	*
	ANTHRACENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	38	650	200	610	74	650	1,600	88	250	62,000	370	3/8	0	0	0	*
	BENZO(A)PYRENE	UG/KG	65	650	230	590	130	650	1,800	82	230	54,000	390	1/8	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	50	650	210	600	83	650	1,600	87	250	60,000	370	3/8	0	*	*	*
	BENZO(E)PYRENE	UG/KG	46	650	200	600	73	47	1,600	88	250	63,000	370	3/8	0	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-1-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Landfill Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	BENZO(G,H,I)PERYLENE	UG/KG	65	650	230	590	130	650	1,800	82	230	54,000	390	1/8	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	41	650	200	610	78	650	1,600	88	250	61,000	370	2/8	0	*	*	*
	BENZOIC ACID	UG/KG	14	1,400	370	1,300	75	1,400	3,000	190	540	290,000	730	6/8	*	*	*	*
	BENZYL ALCOHOL	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	45	650	220	610	95	650	1,700	85	240	58,000	380	1/8	*	*	*	*
	CARBAZOLE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	CHRYSENE	UG/KG	59	650	210	590	90	650	1,700	86	240	59,000	370	3/8	0	0	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	0	0	*
	DIBENZOFURAN	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	DIBENZOTHIOPHENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	FLUORANTHENE	UG/KG	65	650	170	590	100	100	1,400	69	200	38,000	300	4/8	0	0	0	*
	FLUORENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	170	170	170	0	170	170	170	0	0	0	390	0/1	*	*	*	*
	HEXACHLOROETHANE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	780	8,500	2,700	7,700	1,200	8,500	21,000	1,000	3,000	8,700,000	4,600	5/8	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	47	650	230	600	130	650	1,800	83	240	55,000	390	1/8	0	*	*	*
	ISOPHORONE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	650	6,500	2,300	5,900	1,200	6,500	18,000	820	2,300	5,400,000	3,900	3/8	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	NAPETHALENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	0	0	0	*
	NITROBENZENE	UG/KG	65	650	230	590	130	650	1,900	82	230	53,000	390	0/8	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	400	1,600	940	1,200	890	1,600	3,800	310	620	390,000	1,700	0/4	*	*	*	*
	PERYLENE	UG/KG	39	650	230	610	130	650	1,800	83	240	55,000	380	1/8	0	*	*	*
	PHENANTHRENE	UG/KG	32	650	190	620	73	650	1,600	89	250	64,000	360	3/8	0	0	0	*
	PHENOL	UG/KG	65	19,000	2,500	19,000	130	19,000	20,000	2,400	6,700	44,000,000	7,000	1/8	*	*	*	*
	PYRENE	UG/KG	65	1,300	320	1,200	96	1,300	2,500	150	430	190,000	610	4/8	0	1	0	*
	TOTAL PAHs	UG/KG	1,400	21,000	6,400	20,000	2,500	21,000	52,000	2,800	8,000	65,000,000	12,000	5/8	0	2	0	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-1-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Landfill Terrestrial

Analysis	Analyte	Unit	Computation										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	700	2,500	1,400	1,800	1,300	1,300	22,000	130	530	280,000	1,600	0/16	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	700	2,500	1,400	1,800	1,300	1,300	22,000	130	530	280,000	1,600	0/16	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2-CHLOROPHENOL	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2-METEYLNAPHTHALENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	2-METHYLPHENOL	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	2-NITROANILINE	UG/KG	700	2,500	1,400	1,800	1,300	1,300	22,000	130	530	280,000	1,600	0/16	*	*	*	*
	2-NITROPHENOL	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	3-NITROANILINE	UG/KG	700	2,500	1,400	1,800	1,300	1,300	22,000	130	530	280,000	1,600	0/16	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	700	2,500	1,400	1,800	1,300	1,300	22,000	130	530	280,000	1,600	0/16	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	4-CHLOROANILINE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	4-METHYLPHENOL	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	4-NITROANILINE	UG/KG	700	2,500	1,400	1,800	1,300	1,300	22,000	130	530	280,000	1,600	0/16	*	*	*	*
	4-NITROPHENOL	UG/KG	700	2,500	1,400	1,800	1,300	1,300	22,000	130	530	280,000	1,600	0/16	*	*	*	*
	ACENAPHTHENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	ACENAPHTHYLENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	ANTHRACENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	BENZO(A)PYRENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	280	1,000	560	720	530	800	9,000	56	220	50,000	660	0/16	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	CARBAZOLE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	CHRYSENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-1-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Landfill Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ardaman
SEMIVOLATILES	DIBENZOFURAN	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	FLUORANTHENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	FLUORENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	HEXACHLOROETHANE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	2,800	10,000	5,500	7,200	5,300	5,500	88,000	540	2,100	4,600,000	6,400	0/16	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	*	*	*
	ISOPHORONE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	2,000	7,000	3,800	5,000	3,700	3,900	61,000	370	1,500	2,200,000	4,500	0/16	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	NAPHTHALENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	NITROBENZENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	700	2,500	1,400	1,800	1,300	1,300	22,000	130	530	280,000	1,600	0/16	*	*	*	*
	PHENANTHRENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	PHENOL	UG/KG	280	11,000	1,800	11,000	640	550	28,000	680	2,700	7,300,000	3,000	8/16	*	*	*	*
	PYRENE	UG/KG	280	1,000	550	720	530	550	8,800	54	210	46,000	640	0/16	0	0	0	*
	TOTAL PAHs	UG/KG	4,800	17,000	9,300	12,000	8,900	9,400	150,000	910	3,600	13,000,000	11,000	0/16	0	0	0	*
TOTAL METALS	ALUMINUM	MG/KG	4,370	29,400	18,600	25,000	21,000	29,400	446,000	1,480	7,250	52,500,000	21,100	24/24	*	*	*	2
	ANTIMONY	MG/KG	0.70	3.1	1.4	2.4	1.2	1.3	23.7	0.16	0.65	0.42	1.7	5/17	*	2	0	2
	ARSENIC	MG/KG	2.9	57.6	14.6	54.7	11.2	8.4	351	2.5	12.4	154	19.0	24/24	7	18	0	3
	BARIUM	MG/KG	26.0	436	105	410	69.6	436	2,530	19.6	96.1	9,240	139	24/24	*	*	*	0
	BERYLLIUM	MG/KG	0.015	0.56	0.079	0.55	0.030	0.030	1.9	0.029	0.14	0.021	0.13	3/24	*	*	*	2
	CADMIUM	MG/KG	0.030	5.8	0.67	5.8	0.060	0.055	16.0	0.29	1.4	2.1	1.2	5/24	5	4	0	4
	CALCIUM	MG/KG	2,840	13,100	6,300	10,300	5,520	13,100	151,000	522	2,560	6,540,000	7,190	24/24	*	*	*	*
	CHROMIUM	MG/KG	1.8	92.5	53.8	90.7	55.7	55.7	1,290	5.2	25.7	660	62.8	23/24	0	5	0	5
	COBALT	MG/KG	5.2	33.5	15.6	28.3	14.6	29.4	375	1.7	8.1	65.6	18.5	24/24	*	*	*	0
	COPPER	MG/KG	17.8	264	49.7	246	33.3	264	1,190	10.5	51.7	2,670	67.8	24/24	3	11	0	3
	IRON	MG/KG	8,110	50,000	26,200	41,900	25,400	21,800	629,000	2,330	11,400	130,000,000	30,200	24/24	*	*	*	*
	LEAD	MG/KG	1.8	156	31.0	154	13.7	5.3	744	8.6	42.2	1,780	45.8	22/24	5	5	0	2
	MAGNESIUM	MG/KG	3,920	18,700	12,800	14,800	13,700	15,600	307,000	702	3,440	11,800,000	14,000	24/24	*	*	*	*
	MANGANESE	MG/KG	75.1	1,000	348	925	319	1,000	8,340	45.6	223	49,900	425	24/24	*	*	*	0
	MERCURY	MG/KG	0.040	0.48	0.12	0.44	0.090	0.12	2.9	0.021	0.10	0.011	0.15	6/24	1	4	0	2
	MOLYBDENUM	MG/KG	0.13	4.3	2.1	4.1	2.1	3.7	50.6	0.31	1.5	2.3	2.6	7/24	*	*	*	0
	NICKEL	MG/KG	24.7	131	74.0	106	78.6	131	1,780	5.5	26.9	723	83.4	24/24	1	24	19	1
	POTASSIUM	MG/KG	1,790	7,320	4,770	5,530	4,620	7,320	115,000	301	1,470	2,170,000	5,290	24/24	*	*	*	*
	SELENIUM	MG/KG	0.50	2.0	1.0	1.5	1.0	1.1	24.6	0.088	0.43	0.19	1.2	0/24	0	0	0	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERL) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-1-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Landfill Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL METALS	SILVER	MG/KG	0.090	1.2	0.24	1.1	0.18	0.090	5.7	0.047	0.23	0.053	0.32	1/24	1	1	0	*
	SODIUM	MG/KG	4,520	64,600	26,700	60,100	25,700	64,600	642,000	3,820	18,700	350,000,000	33,300	24/24	*	*	*	*
	THALLIUM	MG/KG	0.30	2.2	0.74	1.9	0.58	0.55	17.9	0.094	0.46	0.21	0.91	3/24	*	*	*	*
	VANADIUM	MG/KG	29.6	108	69.9	78.4	70.8	108	1,680	3.8	18.5	342	76.4	24/24	*	*	*	2
	ZINC	MG/KG	25.8	743	144	717	101	743	3,450	29.6	145	21,000	195	23/24	6	6	1	2
VOLATILES	1,1,1-TRICHLOROETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	1,1,2,2-TETRACHLOROETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	1,1,2-TRICHLOROETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	1,1-DICHLOROETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	1,1-DICHLOROETHENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	1,2-DICHLOROETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	1,2-DICHLOROETHENE (TOTAL)	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	1,2-DICHLOROPROPANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	2-BUTANONE	UG/KG	9	390	58	380	24	9	920	24	95	9,000	99	1/16	*	*	*	*
	2-HEXANONE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	4-METHYL-2-PENTANONE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	ACETONE	UG/KG	49	900	210	850	85	55	3,400	64	260	65,000	330	2/16	*	*	*	*
	BENZENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	BROMODICHLOROMETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	BROMOFORM	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	BROMOMETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	CARBON DISULFIDE	UG/KG	9	120	35	110	23	15	570	9	35	1,200	50	7/16	*	*	*	*
	CARBON TETRACHLORIDE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	CHLOROBENZENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	CHLOROETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	CHLOROFORM	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	CHLOROMETHANE	UG/KG	9	48	21	40	18	15	340	3	12	130	25	3/16	*	*	*	*
	CIS-1,3-DICHLOROPROPENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	DIBROMOCHLOROMETHANE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	ETHYLBENZENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	METHYLENE CHLORIDE	UG/KG	9	46	19	37	16	15	300	3	10	110	24	0/16	*	*	*	*
	STYRENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	TETRACHLOROETHENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	TOLUENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	TRANS-1,3-DICHLOROPROPENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	TRICHLOROETHENE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	VINYL CHLORIDE	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*
	XYLENE (TOTAL)	UG/KG	9	35	18	26	16	15	280	2	8	60	21	0/16	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-1-B

Statistical Summary of Surface Water Results

Tidal Area Landfill (Site 1)

Analysis	Analyte	Unit	Concentration										Detection Frequency		
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/L	17	79	40	63	35	79	480	6	20	380	50	12/12	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	1,3-DINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	2,4,6-TRINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	2,4-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	2,6-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	2-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	3-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	4-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	HMX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	NITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	RDX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
	TETRYL	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.7	0.002	0.007	0	0.06	0/12	*
PESTICIDES AND PCBs	4,4'-DDD	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	*
	4,4'-DDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	*
	4,4'-DDT	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	0
	ALDRIN	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	0
	ALPHA-BHC	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	*
	ALPHA-CHLORDANE	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	*
	AROCLOR-1016	UG/L	0.3	0.3	0.3	0	0.3	0.3	3	0	0	0	0.3	0/12	0
	AROCLOR-1221	UG/L	0.3	0.3	0.3	0	0.3	0.3	3	0	0	0	0.3	0/12	0
	AROCLOR-1232	UG/L	0.3	0.3	0.3	0	0.3	0.3	3	0	0	0	0.3	0/12	0
	AROCLOR-1242	UG/L	0.3	0.3	0.3	0	0.3	0.3	3	0	0	0	0.3	0/12	0
	AROCLOR-1248	UG/L	0.3	0.3	0.3	0	0.3	0.3	3	0	0	0	0.3	0/12	0
	AROCLOR-1254	UG/L	0.3	0.3	0.3	0	0.3	0.3	3	0	0	0	0.3	0/12	0
	AROCLOR-1260	UG/L	0.3	0.3	0.3	0	0.3	0.3	3	0	0	0	0.3	0/12	0
	BETA-BHC	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	*
	DELTA-BHC	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	*
	DIELDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	0
	ENDOSULFAN I	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	0
	ENDOSULFAN II	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	0
	ENDOSULFAN SULFATE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	*
	ENDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	0
	ENDRIN ALDEHYDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	*
	ENDRIN KETONE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.6	0	0	0	0.05	0/12	*
	GAMMA-BHC (LINDANE)	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	0
	GAMMA-CHLORDANE	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	*
	HEPTACHLOR	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.3	0	0	0	0.03	0/12	0
	HEPTACHLOR EPOXIDE	UG/L	0.005	0.005	0.005	0	0.005	0.005	0.06	0	0	0	0.005	0/12	0
	METHOXYCHLOR	UG/L	0.3	0.3	0.3	0	0.3	0.3	3	0	0	0	0.3	0/12	0
	TOTAL DDTs	UG/L	0.2	0.2	0.2	0	0.2	0.2	2	0	0	0	0.2	0/12	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-1-B

Statistical Summary of Surface Water Results

Tidal Area Landfill (Site 1)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
PESTICIDES AND PCBs	TOTAL PCBs	UG/L	2	2	2	0	2	2	21	0	0	0	2	0/12	*
	TOXAPHENE	UG/L	2	2	2	0	2	2	18	0	0	0	2	0/12	*
TOTAL SUSPENDED SOLIDS	TOTAL SUSPENDED SOLIDS	MG/L	5	87	50	82	52	87	610	8	29	840	65	11/12	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	1,2-DICHLOROBENZENE	UG/L	3	25	4	23	3	3	53	2	6	42	8	0/12	*
	1,3-DICHLOROBENZENE	UG/L	3	25	4	23	3	3	53	2	6	42	8	0/12	*
	1,4-DICHLOROBENZENE	UG/L	3	25	4	23	3	3	53	2	6	42	8	0/12	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2,4,5-TRICHLOROPHENOL	UG/L	13	130	22	110	13	13	260	9	32	1,100	39	0/12	*
	2,4,6-TRICHLOROPHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2,4-DICHLOROPHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2,4-DIMETHYLPHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2,4-DINITROPHENOL	UG/L	13	130	22	110	13	13	260	9	32	1,100	39	0/12	*
	2,4-DINITROTOLUENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2,6-DINITROTOLUENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2-CHLORONAPHTHALENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2-CHLOROPHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2-METHYLNAPHTHALENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2-METHYLPHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	2-NITROANILINE	UG/L	13	130	22	110	13	13	260	9	32	1,100	39	0/12	*
	2-NITROPHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	3,3'-DICHLOROBENZIDINE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	3-NITROANILINE	UG/L	13	130	22	110	13	13	260	9	32	1,100	39	0/12	*
	4,6-DINITRO-2-METHYLPHENOL	UG/L	13	130	22	110	13	13	260	9	32	1,100	39	0/12	*
	4-BROMOPHENYL-PHENYLETHER	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	4-CHLORO-3-METHYLPHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	4-CHLOROANILINE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	4-CHLOROPHENYL-PHENYLETHER	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	4-METHYLPHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	4-NITROANILINE	UG/L	13	130	22	110	13	13	260	9	32	1,100	39	0/12	*
	4-NITROPHENOL	UG/L	13	130	22	110	13	13	260	9	32	1,100	39	0/12	*
	ACENAPHTHENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	ACENAPHTHYLENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	ANTHRACENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	BENZO(A)ANTHRACENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	BENZO(A)PYRENE	UG/L	5	5	5	0	5	5	55	0	0	0	5	0/11	*
	BENZO(B)FLUORANTHENE	UG/L	5	5	5	0	5	5	55	0	0	0	5	0/11	*
	BENZO(G,H,I)PERYLENE	UG/L	5	5	5	0	5	5	55	0	0	0	5	0/11	*
	BENZO(K)FLUORANTHENE	UG/L	5	5	5	0	5	5	55	0	0	0	5	0/11	*
	BIS(2-CHLOROETHOXY)METHANE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-1-B

Statistical Summary of Surface Water Results

Tidal Area Landfill (Site 1)

Analyte	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>QBA Guidance Values
SEMIVOLATILES	BIS(2-CHLOROETHYL)ETHER	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	2	20	4	18	2	2	42	2	5	27	6	0/12	*
	BUTYLBENZYLPHTHALATE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	CARBAZOLE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	CHRYSENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	DI-N-BUTYLPHTHALATE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	DI-N-OCTYLPHTHALATE	UG/L	5	5	5	0	5	5	55	0	0	0	5	0/11	*
	DIBENZ(A,H)ANTHRACENE	UG/L	5	5	5	0	5	5	55	0	0	0	5	0/11	*
	DIBENZOFURAN	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	DIETHYLPHTHALATE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	DIMETHYLPHTHALATE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	FLUORANTHENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	FLUORENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	HEXACHLOROBENZENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	HEXACHLOROBUTADIENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	HEXACHLOROCYCLOPENTADIENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	HEXACHLOROETHANE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	HIGH MOLECULAR PAHs	UG/L	50	200	63	150	50	50	750	13	43	1,900	85	0/12	*
	INDENO(1,2,3-CD)PYRENE	UG/L	5	5	5	0	5	5	55	0	0	0	5	0/11	*
	ISOPHORONE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	LOW MOLECULAR PAHs	UG/L	35	350	61	320	35	35	740	26	91	8,300	110	0/12	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	N-NITROSODIPHENYLAMINE (1)	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	NAPHTHALENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	NITROBENZENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	PENTACHLOROPHENOL	UG/L	5	130	21	120	13	13	260	9	33	1,100	38	0/12	0
	PHENANTHRENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	PHENOL	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	PYRENE	UG/L	5	50	9	45	5	5	110	4	13	170	15	0/12	*
	TOTAL PAHs	UG/L	85	550	120	470	85	85	1,500	39	130	18,000	190	0/12	0
TOTAL METALS	ALUMINUM	UG/L	26.4	1,370	294	1,340	64.8	1,370	3,530	138	477	227,000	541	6/12	5
	ANTIMONY	UG/L	0.80	1.3	1.0	0.45	1.1	1.2	12.5	0.053	0.18	0.034	0.11	0/12	*
	ARSENIC	UG/L	1.6	15.7	7.2	15.1	5.5	16.7	85.9	1.5	5.2	26.9	3.8	9/12	0
	BARIUM	UG/L	48.6	316	189	267	196	316	2,270	22.8	78.8	6,210	230	12/12	*
	BERYLLIUM	UG/L	0.050	0.10	0.067	0.050	0.050	0.050	0.81	0.0070	0.024	0.00059	0.080	0/12	*
	CADMIUM	UG/L	0.10	1.8	0.30	1.7	0.15	0.10	3.6	0.14	0.48	0.23	0.55	2/12	1
	CALCIUM	UG/L	85,600	385,000	269,000	299,000	272,000	385,000	3,230,000	25,100	86,900	7,560,000,000	314,000	12/12	*
	CHROMIUM	UG/L	0.20	5.5	1.2	5.3	0.80	0.90	14.7	0.45	1.6	2.4	2.0	2/12	0
	COBALT	UG/L	0.29	9.7	4.0	9.4	3.4	2.8	48.0	0.71	2.5	6.1	5.3	11/12	*
	COPPER	UG/L	1.3	14.5	6.8	13.3	6.9	14.5	81.8	1.3	4.6	21.1	9.2	7/12	7
	IRON	UG/L	292	23,200	5,050	22,900	3,210	23,200	60,500	1,780	6,180	38,200,000	8,250	12/12	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QBA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-1-B

Statistical Summary of Surface Water Results

Tidal Area Landfill (Site 1)

Analysis	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	With Guidance Values
TOTAL METALS	LEAD	UG/L	0.40	2.9	0.99	2.5	0.75	0.40	11.9	0.23	0.79	0.63	1.4	2/12	0
	MAGNESIUM	UG/L	87,700	635,000	383,000	547,000	379,000	635,000	4,600,000	49,900	173,000	29,800,000,000	473,000	12/12	*
	MANGANESE	UG/L	560	3,180	1,830	2,620	1,590	3,180	21,900	271	940	883,000	2,310	12/12	*
	MERCURY	UG/L	0.050	0.10	0.067	0.050	0.050	0.050	0.80	0.0071	0.025	0.00061	0.079	0/12	0
	MOLYBDENUM	UG/L	2.8	19.8	8.5	17.1	8.0	6.6	102	1.4	4.8	23.1	11.0	9/12	*
	NICKEL	UG/L	1.7	28.6	13.5	26.9	12.8	28.6	163	2.6	8.9	79.0	18.2	7/12	6
	POTASSIUM	UG/L	22,400	124,000	70,000	102,000	74,500	124,000	840,000	8,740	30,300	916,000,000	65,700	12/12	*
	SELENIUM	UG/L	1.2	2.5	1.7	1.4	1.8	1.8	20.0	0.11	0.38	0.14	1.9	1/12	0
	SILVER	UG/L	0.25	0.65	0.40	0.40	0.30	0.65	4.8	0.054	0.19	0.035	0.50	0/12	0
	SODIUM	UG/L	561,000	4,160,000	2,410,000	3,600,000	2,230,000	4,160,000	29,000,000	333,000	1,150,000	.13300E+13	3,010,000	12/12	*
	THALLIUM	UG/L	0.95	2.4	1.4	1.4	1.0	2.4	17.2	0.20	0.68	0.46	1.8	0/12	*
	VANADIUM	UG/L	0.80	10.5	2.9	9.7	1.6	1.4	34.6	0.86	3.0	8.8	4.4	4/12	*
	ZINC	UG/L	3.7	48.0	18.2	44.3	15.6	48.0	219	3.7	12.9	165	24.9	4/12	0
VOLATILES	1,1,1-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	1,1,2,2-TETRACHLOROETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	1,1,2-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	1,1-DICHLOROETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	1,1-DICHLOROETHENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	1,2-DICHLOROETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	1,2-DICHLOROETHENE (TOTAL)	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	1,2-DICHLOROPROPANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	2-BUTANONE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	2-HEXANONE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	4-METHYL-2-PENTANONE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	ACETONE	UG/L	5	6	5	0.5	5	5	61	0.04	0.1	0.02	5	0/12	*
	BENZENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	BROMODICHLOROMETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	BROMOFORM	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	BROMOMETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	CARBON DISULFIDE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	CARBON TETRACHLORIDE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	CHLOROBENZENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	CHLOROETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	CHLOROFORM	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	CHLOROMETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	CIS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	DIBROMOCHLOROMETHANE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	ETHYLBENZENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	METHYLENE CHLORIDE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	STYRENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	TETRACHLOROETHENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-1-B

Statistical Summary of Surface Water Results

Tidal Area Landfill (Site 1)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
VOLATILES	TOLUENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	TRANS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	TRICHLOROETHENE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	VINYL CHLORIDE	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*
	XYLENE (TOTAL)	UG/L	5	5	5	0	5	5	60	0	0	0	5	0/12	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-2-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial

			Concentration										Detection Frequency				
Analysis	Analyte	Units	Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/KG	52	320,000	43,000	320,000	18,000	37,000	3,200,000	7,800	67,000	4,500,000,000	56,000	66/73	*	*	*	*
HEXAVALENT CHROMIUM	HEXAVALENT CHROMIUM	UG/KG	25.0	125	36.1	100	25.0	25.0	325	11.1	33.3	1,110	56.8	0/9	*	*	*	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	1,3-DINITROBENZENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	2,4,6-TRINITROTOLUENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	2-NITROTOLUENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	3-NITROTOLUENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	4-NITROTOLUENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	HMX	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	NITROBENZENE	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	RDX	UG/KG	60	60	60	0	60	60	300	0	0	0	60	0/5	*	*	*	*
	TETRYL	UG/KG	60	60	60	0	60	60	240	0	0	0	60	0/4	*	*	*	*
LOW LEVEL PESTICIDES AND PCBs	2,4'-DDD	UG/KG	0.05	7	0.9	6	0.1	0.06	47	0.2	2	2	1	24/54	*	*	*	*
	2,4'-DDE	UG/KG	0.05	1	0.2	1	0.08	0.06	10	0.03	0.2	0.06	0.2	14/54	*	*	*	*
	2,4'-DDT	UG/KG	0.05	5	0.6	5	0.2	0.06	32	0.1	1	1	0.8	31/54	*	*	*	*
	4,4'-DDD	UG/KG	0.05	26	2	26	0.4	0.06	120	0.7	5	23	3	32/54	*	12	2	*
	4,4'-DDE	UG/KG	0.05	9	1	9	0.6	5	68	0.2	2	3	2	45/54	*	10	0	*
	4,4'-DDT	UG/KG	0.05	28	2	28	0.6	2	130	0.6	5	22	4	38/54	*	23	6	*
	ALDRIN	UG/KG	0.05	0.8	0.1	0.7	0.07	0.06	8	0.02	0.1	0.02	0.2	10/54	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	0.05	3	0.5	2	0.2	0.06	25	0.09	0.6	0.4	0.6	28/54	*	*	*	*
	DIELDRIN	UG/KG	0.05	2	0.3	2	0.08	0.06	14	0.05	0.4	0.1	0.3	16/54	0	15	0	*
	GAMMA-BHC (LINDANE)	UG/KG	0.05	0.9	0.1	0.8	0.07	0.06	8	0.03	0.2	0.04	0.2	7/54	*	*	*	*
	HEPTACHLOR	UG/KG	0.05	0.4	0.1	0.4	0.08	0.07	5	0.01	0.08	0.006	0.1	2/54	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.05	1	0.1	0.9	0.07	0.06	8	0.02	0.2	0.03	0.2	8/54	*	*	*	*
	HEXACHLOROBENZENE	UG/KG	0.05	2	0.2	2	0.09	0.06	12	0.04	0.3	0.07	0.3	18/54	0	*	*	*
	MIREX	UG/KG	0.05	1	0.2	1	0.07	0.06	9	0.03	0.3	0.06	0.2	13/54	*	*	*	*
	PCB-101 (2,2',3,5,5')	UG/KG	0.05	1	0.2	1	0.08	0.07	12	0.04	0.3	0.07	0.3	19/54	*	*	*	*
	PCB-105 (2,3,3',4,4')	UG/KG	0.05	1	0.2	1	0.08	0.06	10	0.03	0.2	0.05	0.2	16/54	*	*	*	*
	PCB-118 (2,3',4,4',5)	UG/KG	0.05	1	0.3	1	0.08	0.06	14	0.05	0.3	0.1	0.3	18/54	*	*	*	*
	PCB-126 (3,3',4,4',5)	UG/KG	0.05	4	0.4	4	0.08	0.06	19	0.1	0.7	0.5	0.5	13/54	*	*	*	*
	PCB-128 (2,2',3,3',4,4')	UG/KG	0.05	0.6	0.1	0.5	0.07	0.06	7	0.02	0.1	0.02	0.2	7/54	*	*	*	*
	PCB-138 (2,2',3,4,4',5')	UG/KG	0.05	2	0.3	2	0.1	0.07	19	0.06	0.5	0.2	0.5	23/54	*	*	*	*
	PCB-153 (2,2',4,4',5,5')	UG/KG	0.05	2	0.3	2	0.08	0.07	14	0.05	0.4	0.1	0.4	21/54	*	*	*	*
	PCB-170 (2,2',3,3',4,4',5)	UG/KG	0.05	0.9	0.1	0.9	0.07	0.06	7	0.02	0.1	0.02	0.2	5/54	*	*	*	*
	PCB-18 (2,2',5)	UG/KG	0.05	0.4	0.1	0.3	0.07	0.06	6	0.01	0.07	0.006	0.1	6/54	*	*	*	*
	PCB-180 (2,2',3,4,4',5,5')	UG/KG	0.05	2	0.2	2	0.07	0.06	12	0.04	0.3	0.1	0.3	15/54	*	*	*	*
	PCB-187 (2,2',3,4',5,5',6)	UG/KG	0.05	0.8	0.2	0.7	0.08	0.07	9	0.02	0.2	0.03	0.2	13/54	*	*	*	*
	PCB-195 (2,2',3,3',4,4',5,6)	UG/KG	0.05	0.4	0.1	0.3	0.07	0.06	5	0.01	0.07	0.005	0.1	3/54	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERL) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-2-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Maximum	Minimum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL PESTICIDES AND PCBs	PCB-206 (2,2',3,3',4,4',5,5',	UG/KG	0.05	1	0.2	1	0.08	0.07	9	0.03	0.2	0.03	0.2	17/54	*	*	*	*
	PCB-209 (2,2',3,3',4,4',5,5',6	UG/KG	0.05	0.4	0.09	0.3	0.07	0.06	5	0.009	0.06	0.004	0.1	2/54	*	*	*	*
	PCB-28 (2,4,4')	UG/KG	0.05	0.5	0.1	0.4	0.07	0.06	5	0.01	0.08	0.007	0.1	2/54	*	*	*	*
	PCB-44 (2,2',3,5')	UG/KG	0.05	0.3	0.1	0.2	0.07	0.06	5	0.009	0.06	0.004	0.1	3/54	*	*	*	*
	PCB-52 (2,2',5,5')	UG/KG	0.05	0.3	0.1	0.3	0.07	0.06	6	0.01	0.07	0.005	0.1	11/54	*	*	*	*
	PCB-66 (2,3',4,4')	UG/KG	0.05	1	0.2	1	0.07	0.06	9	0.03	0.2	0.05	0.2	13/54	*	*	*	*
	PCB-77 (3,3',4,4')	UG/KG	0.05	1	0.2	1	0.08	0.06	12	0.04	0.3	0.08	0.3	14/54	*	*	*	*
	PCB-8 (2,4')	UG/KG	0.05	4	0.4	4	0.08	0.06	21	0.09	0.7	0.5	0.5	15/54	*	*	*	*
	TOTAL DDTs	UG/KG	0.3	73	8	73	2	1	410	2	13	160	10	48/54	0	36	2	*
	TOTAL PCBs	UG/KG	1	14	4	13	3	1	200	0.4	3	10	4	44/54	0	0	0	*
	TRANS-NONACHLOR	UG/KG	0.06	2	0.5	2	0.1	0.06	26	0.09	0.7	0.4	0.6	26/54	*	*	*	*
PESTICIDES AND PCBs	4,4'-DDD	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	*	0	0	*
	4,4'-DDE	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	*	0	0	*
	4,4'-DDT	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	*	0	0	*
	ALDRIN	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	ALPHA-BHC	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	AROCLOR-1016	UG/KG	20	70	37	50	34	55	730	3	16	240	43	0/20	*	*	*	*
	AROCLOR-1221	UG/KG	40	150	74	110	68	110	1,500	7	32	1,000	86	0/20	*	*	*	*
	AROCLOR-1232	UG/KG	20	70	37	50	34	55	730	3	16	240	43	0/20	*	*	*	*
	AROCLOR-1242	UG/KG	20	70	37	50	34	55	730	3	16	240	43	0/20	*	*	*	*
	AROCLOR-1248	UG/KG	20	70	37	50	34	55	730	3	16	240	43	0/20	*	*	*	*
	AROCLOR-1254	UG/KG	20	70	37	50	34	55	730	3	16	240	43	0/20	*	*	*	*
	AROCLOR-1260	UG/KG	20	70	37	50	34	55	730	3	16	240	43	0/20	*	*	*	*
	BETA-BHC	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	DELTA-BHC	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	DIELDRIN	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	0	0	0	*
	ENDOSULFAN I	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	ENDOSULFAN II	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	*	*	*	*
	ENDOSULFAN SULFATE	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	*	*	*	*
	ENDRIN	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	*	0	0	*
	ENDRIN ALDEHYDE	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	*	*	*	*
	ENDRIN KETONE	UG/KG	2	7	4	5	3	6	73	0.3	2	2	4	0/20	*	*	*	*
	GAMMA-BHC (LINDANE)	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	GAMMA-CHLORDANE	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	HEPTACHLOR	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	1	4	2	3	2	1	37	0.2	0.8	0.6	2	0/20	*	*	*	*
	METHOXYCHLOR	UG/KG	10	36	18	26	17	11	370	2	8	62	21	0/20	*	*	*	*
	TOTAL DDTs	UG/KG	6	21	11	15	10	17	220	1	5	22	13	0/20	0	0	0	*
	TOTAL PCBs	UG/KG	160	570	290	410	270	440	5,900	28	130	16,000	340	0/20	0	0	0	*
	TOXAPHENE	UG/KG	100	360	180	260	170	110	3,700	18	79	6,200	210	0/20	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-2-C

Statistical Summary of Surface Water Results

R Area Disposal Site (Site 9)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
SEMIVOLATILES	BIS(2-CHLOROETHYL)ETHER	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	2	3	2	1	2	2	30	0.05	0.2	0.04	2	0/15	*
	BUTYLBENZYLPHTHALATE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CARBAZOLE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CHRYSENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	DI-N-BUTYLPHTHALATE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	DI-N-OCTYLPHTHALATE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	DIBENZ(A,H)ANTHRACENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	DIBENZOFURAN	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	DIETHYLPHTHALATE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	DIMETHYLPHTHALATE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	FLUORANTHENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	FLUORENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	HEXACHLOROBENZENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	HEXACHLOROBUTADIENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	HEXACHLOROCYCLOPENTADIENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	HEXACHLOROETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	HIGH MOLECULAR PAHs	UG/L	50	50	50	0	50	50	750	0	0	0	50	0/15	*
	INDENO(1,2,3-CD)PYRENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	ISOPHORONE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	LOW MOLECULAR PAHs	UG/L	35	35	35	0	35	35	530	0	0	0	35	0/15	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	N-NITROSODIPHENYLAMINE (1)	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	NAPHTHALENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	NITROBENZENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	PENTACHLOROPHENOL	UG/L	13	13	13	0	13	13	190	0	0	0	13	0/15	0
	PHENANTHRENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	PHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	PYRENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	TOTAL PAHs	UG/L	85	85	85	0	85	85	1,300	0	0	0	85	0/15	0
TOTAL METALS	ALUMINUM	UG/L	45.5	5,570	549	5,520	229	5,570	9,730	357	1,380	1,920,000	1,290	12/15	11
	ANTIMONY	UG/L	0.80	2.1	1.1	1.3	1.1	0.80	15.9	0.087	0.34	0.11	1.2	0/15	*
	ARSENIC	UG/L	0.70	23.9	7.3	23.2	3.6	23.9	109	2.1	8.3	68.5	11.0	12/15	0
	BARIUM	UG/L	22.9	133	68.4	110	52.8	133	1,030	8.4	32.4	1,050	83.1	15/15	*
	BERYLLIUM	UG/L	0.050	0.18	0.080	0.13	0.070	0.050	1.2	0.0094	0.036	0.0013	0.097	0/15	*
	CADMIUM	UG/L	0.10	8.3	1.2	8.2	0.32	0.10	18.2	0.56	2.2	4.6	2.2	5/15	4
	CALCIUM	UG/L	34,800	555,000	268,000	520,000	221,000	555,000	4,020,000	38,700	150,000	22,500,000,000	336,000	15/15	*
	CHROMIUM	UG/L	0.20	6.3	1.5	6.1	0.70	0.20	21.9	0.51	2.0	4.0	2.4	2/15	0
	COBALT	UG/L	0.51	129	35.8	128	27.9	129	537	9.0	34.7	1,210	51.6	14/15	*
	COPPER	UG/L	1.6	32.0	9.8	30.4	10.1	32.0	147	2.1	8.3	68.1	13.6	9/15	9
	IRON	UG/L	601	239,000	45,700	238,000	8,340	239,000	685,000	20,000	77,500	6,010,000,000	80,900	15/15	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-2-C

Statistical Summary of Surface Water Results

R Area Disposal Site (Site 9)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>QEA Guidance Values
TOTAL METALS	LEAD	UG/L	0.40	41.5	4.1	41.1	0.95	0.40	62.1	2.7	10.5	110	8.9	4/15	3
	MAGNESIUM	UG/L	59,400	1,540,000	513,000	1,480,000	351,000	1,540,000	7,690,000	106,000	411,000	.16900E+12	700,000	15/15	*
	MANGANESE	UG/L	312	11,300	4,440	11,000	3,470	11,300	66,500	852	3,300	10,900,000	5,940	15/15	*
	MERCURY	UG/L	0.050	0.35	0.11	0.30	0.050	0.050	1.6	0.027	0.10	0.011	0.15	3/15	3
	MOLYBDENUM	UG/L	0.30	12.8	2.1	12.5	0.55	0.30	31.5	0.87	3.4	11.4	3.6	4/15	*
	NICKEL	UG/L	1.7	211	62.7	209	40.0	211	940	26.7	64.7	4,180	92.1	11/15	11
	POTASSIUM	UG/L	20,400	309,000	105,000	289,000	84,800	309,000	1,580,000	19,900	77,000	5,930,000,000	140,000	15/15	*
	SELENIUM	UG/L	1.2	4.2	1.9	3.0	1.7	1.2	28.5	0.25	0.97	0.93	2.3	3/15	0
	SILVER	UG/L	0.25	0.65	0.37	0.40	0.30	0.25	5.6	0.045	0.18	0.031	0.45	0/15	0
	SODIUM	UG/L	489,000	9,360,000	3,100,000	8,870,000	2,280,000	9,360,000	46,500,000	625,000	2,430,000	.58800E+13	4,200,000	15/15	*
	THALLIUM	UG/L	0.95	8.1	2.2	7.2	1.3	2.4	33.1	0.50	1.9	3.7	3.1	2/15	*
	VANADIUM	UG/L	0.20	33.7	6.5	33.5	1.6	0.20	97.3	2.7	10.6	113	11.3	7/15	*
	ZINC	UG/L	11.2	265	86.4	254	57.6	265	1,300	20.3	78.5	6,170	122	15/15	7
VOLATILES	1,1,1-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	1,1,2,2-TETRACHLOROETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	1,1,2-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	1,1-DICHLOROETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	1,1-DICHLOROETHENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	1,2-DICHLOROETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	1,2-DICHLOROETHENE (TOTAL)	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	1,2-DICHLOROPROPANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2-BUTANONE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2-HEXANONE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	4-METHYL-2-PENTANONE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	ACETONE	UG/L	5	11	7	6	5	5	100	0.6	2	5	8	0/15	*
	BENZENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BROMODICHLOROMETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BROMOFORM	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BROMOMETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CARBON DISULFIDE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CARBON TETRACHLORIDE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CHLOROBENZENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CHLOROETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CHLOROFORM	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CHLOROMETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	CIS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	DIBROMOCHLOROMETHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	ETHYLBENZENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	METHYLENE CHLORIDE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	STYRENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	TETRACHLOROETHENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-2-C

Statistical Summary of Surface Water Results

R Area Disposal Site (Site 9)

Analyses	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	J-QEA Guidance Values
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/L	12	71	40	59	37	71	610	5	18	330	49	15/15	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	1,3-DINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	2,4,6-TRINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	2,4-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	2,6-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	2-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	3-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	4-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	HMX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	NITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	RDX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.007	0	0.06	0/15	*
	TETRYL	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.9	0.002	0.006	0	0.06	0/14	*
PESTICIDES AND PCBs	4,4'-DDD	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	*
	4,4'-DDE	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	*
	4,4'-DDT	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	0
	ALDRIN	UG/L	0.03	0.1	0.03	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.04	1/15	0
	ALPHA-BHC	UG/L	0.03	0.1	0.04	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.05	3/15	*
	ALPHA-CHLORDANE	UG/L	0.03	0.1	0.03	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.04	0/15	*
	AROCLOR-1016	UG/L	0.3	1	0.3	1	0.3	0.3	5	0.07	0.3	0.07	0.4	0/15	0
	AROCLOR-1221	UG/L	0.3	1	0.3	1	0.3	0.3	5	0.07	0.3	0.07	0.4	0/15	0
	AROCLOR-1232	UG/L	0.3	1	0.3	1	0.3	0.3	5	0.07	0.3	0.07	0.4	0/15	0
	AROCLOR-1242	UG/L	0.3	1	0.3	1	0.3	0.3	5	0.07	0.3	0.07	0.4	0/15	0
	AROCLOR-1248	UG/L	0.3	1	0.3	1	0.3	0.3	5	0.07	0.3	0.07	0.4	0/15	0
	AROCLOR-1254	UG/L	0.3	1	0.3	1	0.3	0.3	5	0.07	0.3	0.07	0.4	0/15	0
	AROCLOR-1260	UG/L	0.3	1	0.3	1	0.3	0.3	5	0.07	0.3	0.07	0.4	0/15	0
	BETA-BHC	UG/L	0.03	0.1	0.03	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.04	1/15	*
	DELTA-BHC	UG/L	0.03	0.1	0.03	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.04	0/15	*
	DIELDRIN	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	0
	ENDOSULFAN I	UG/L	0.03	0.1	0.03	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.04	0/15	0
	ENDOSULFAN II	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	0
	ENDOSULFAN SULFATE	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	*
	ENDRIN	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	0
	ENDRIN ALDEHYDE	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	*
	ENDRIN KETONE	UG/L	0.05	0.3	0.06	0.2	0.05	0.05	1	0.01	0.05	0.003	0.09	0/15	*
	GAMMA-BHC (LINDANE)	UG/L	0.03	0.1	0.03	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.04	0/15	0
	GAMMA-CHLORDANE	UG/L	0.03	0.1	0.03	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.04	0/15	*
	HEPTACHLOR	UG/L	0.03	0.1	0.03	0.1	0.03	0.03	0.5	0.007	0.03	0.0007	0.04	0/15	0
	HEPTACHLOR EPOXIDE	UG/L	0.005	0.04	0.009	0.03	0.005	0.005	0.1	0.002	0.009	0.00009	0.01	2/15	2
	METHOXYCHLOR	UG/L	0.3	1	0.3	1	0.3	0.3	5	0.07	0.3	0.07	0.4	0/15	0
	TOTAL DDTs	UG/L	0.2	0.8	0.2	0.6	0.2	0.2	3	0.04	0.2	0.02	0.3	0/15	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-2-C

Statistical Summary of Surface Water Results

R Area Disposal Site (Site 9)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
PESTICIDES AND PCBs	TOTAL PCBs	UG/L	2	9	2	7	2	2	33	0.5	2	3	3	0/15	*
	TOXAPHENE	UG/L	2	8	2	6	2	2	29	0.4	2	3	3	0/15	*
TOTAL SUSPENDED SOLIDS	TOTAL SUSPENDED SOLIDS	MG/L	5	5,400	580	5,400	99	51	8,700	360	1,400	2,000,000	1,200	14/15	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	1,2-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	38	0	0	0	3	0/15	*
	1,3-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	38	0	0	0	3	0/15	*
	1,4-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	38	0	0	0	3	0/15	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2,4,5-TRICHLOROPHENOL	UG/L	13	13	13	0	13	13	190	0	0	0	13	0/15	*
	2,4,6-TRICHLOROPHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2,4-DICHLOROPHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2,4-DIMETHYLPHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2,4-DINITROPHENOL	UG/L	13	13	13	0	13	13	190	0	0	0	13	0/15	*
	2,4-DINITROTOLUENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2,6-DINITROTOLUENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2-CHLORONAPHTHALENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2-CHLOROPHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2-METHYLNAPHTHALENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2-METHYLPHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	2-NITROANILINE	UG/L	13	13	13	0	13	13	190	0	0	0	13	0/15	*
	2-NITROPHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	3,3'-DICHLOROBENZIDINE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	3-NITROANILINE	UG/L	13	13	13	0	13	13	190	0	0	0	13	0/15	*
	4,6-DINITRO-2-METHYLPHENOL	UG/L	13	13	13	0	13	13	190	0	0	0	13	0/15	*
	4-BROMOPHENYL-PHENYLETHER	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	4-CHLORO-3-METHYLPHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	4-CHLOROANILINE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	4-CHLOROPHENYL-PHENYLETHER	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	4-METHYLPHENOL	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	4-NITROANILINE	UG/L	13	13	13	0	13	13	190	0	0	0	13	0/15	*
	4-NITROPHENOL	UG/L	13	13	13	0	13	13	190	0	0	0	13	0/15	*
	ACENAPHTHENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	ACENAPHTHYLENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	ANTHRACENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BENZO(A)ANTHRACENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BENZO(A)PYRENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BENZO(B)FLUORANTHENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BENZO(G,H,I)PERYLENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BENZO(K)FLUORANTHENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	BIS(2-CHLOROETHOXY)METHANE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-2-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial and Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	BENZO(K)FLUORANTHENE	UG/KG	84	84	84	0	84	84	84	0	0	0	13	1/1	0	*	*	*
	BENZOIC ACID	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	BENZYL ALCOHOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	330	330	330	0	330	330	330	0	0	0	13	0/1	*	*	*	*
	BUTYLBENZYLPHTEALATE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	CARBAZOLE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	CHRYSENE	UG/KG	180	180	180	0	180	180	180	0	0	0	13	1/1	0	0	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	0	0	*
	DIBENZOFURAN	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	DIBENZOTHIOPHENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	FLUORANTHENE	UG/KG	220	220	220	0	220	220	220	0	0	0	13	1/1	0	0	0	*
	FLUORENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	230	230	230	0	230	230	230	0	0	0	12	0/1	*	*	*	*
	HEXACHLOROETHANE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	1,800	1,800	1,800	0	1,800	1,800	1,800	0	0	0	13	1/1	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	92	92	92	0	92	92	92	0	0	0	13	1/1	0	*	*	*
	ISOPHORONE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	2,200	2,200	2,200	0	2,200	2,200	2,200	0	0	0	13	1/1	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	230	230	230	0	230	230	230	0	0	0	12	0/1	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	NAPETHALENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	0	0	*
	NITROBENZENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	PERYLENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	*	*	*
	PHENANTHRENE	UG/KG	120	120	120	0	120	120	120	0	0	0	13	1/1	0	0	0	*
	PHENOL	UG/KG	60	60	60	0	60	60	60	0	0	0	13	0/1	*	*	*	*
	PYRENE	UG/KG	190	190	190	0	190	190	190	0	0	0	13	1/1	0	0	0	*
	TOTAL PAHs	UG/KG	4,000	4,000	4,000	0	4,000	4,000	4,000	0	0	0	13	1/1	0	1	0	*
TOTAL METALS	ALUMINUM	MG/KG	14,300	16,800	15,800	2,500	16,300	16,800	47,400	764	1,320	1,750,000	18,000	3/3	*	*	*	0
	ANTIMONY	MG/KG	0.30	0.87	0.60	0.57	0.64	0.87	1.8	0.17	0.29	0.082	1.1	2/3	*	0	0	0
	ARSENIC	MG/KG	4.3	25.1	12.4	20.8	7.9	25.1	37.3	6.4	11.1	124	31.2	3/3	1	1	0	0
	BARIUM	MG/KG	159	174	169	15.0	174	174	507	5.0	8.7	75.0	184	3/3	*	*	*	0
	BERYLLIUM	MG/KG	0.010	0.040	0.022	0.030	0.015	0.040	0.065	0.0093	0.016	0.00026	0.049	0/3	*	*	*	0

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-2-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial and Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL METALS	CADMIUM	MG/KG	0.020	0.030	0.025	0.010	0.025	0.030	0.075	0.0029	0.0050	0.000030	0.033	0/3	0	0	0	0
	CALCIUM	MG/KG	8,210	13,100	10,800	4,890	11,100	13,100	32,400	1,420	2,460	6,040,000	14,900	3/3	*	*	*	*
	CHROMIUM	MG/KG	27.7	65.5	40.9	37.8	29.4	65.5	123	12.3	21.4	456	76.9	3/3	0	0	0	0
	COBALT	MG/KG	15.3	21.9	18.4	6.6	18.0	21.9	55.2	1.9	3.3	11.0	24.0	3/3	*	*	*	0
	COPPER	MG/KG	25.6	55.3	36.8	29.7	29.5	55.3	110	9.3	15.1	260	64.0	3/3	0	1	0	0
	IRON	MG/KG	22,500	49,500	32,600	27,000	25,700	49,500	97,700	8,520	14,800	218,000,000	57,400	3/3	*	*	*	*
	LEAD	MG/KG	8.7	41.0	27.0	32.3	31.4	41.0	81.1	9.6	16.6	275	55.0	3/3	0	0	0	0
	MAGNESIUM	MG/KG	8,620	10,100	9,450	1,480	9,630	10,100	28,400	437	756	572,000	10,700	3/3	*	*	*	*
	MANGANESE	MG/KG	525	859	695	334	701	859	2,090	96.5	167	27,900	977	3/3	*	*	*	0
	MERCURY	MG/KG	0.030	0.085	0.053	0.055	0.045	0.085	0.16	0.016	0.028	0.00081	0.10	0/3	0	0	0	0
	MOLYBDENUM	MG/KG	0.10	0.13	0.11	0.030	0.11	0.13	0.34	0.0093	0.016	0.00026	0.04	0/3	*	*	*	0
	NICKEL	MG/KG	29.0	89.7	58.8	60.7	55.4	89.7	174	17.6	30.4	926	109	3/3	0	3	2	0
	POTASSIUM	MG/KG	2,150	3,180	2,640	1,030	2,590	3,180	7,920	298	517	267,000	3,510	3/3	*	*	*	*
	SELENIUM	MG/KG	0.37	0.49	0.42	0.12	0.40	0.49	1.3	0.035	0.060	0.0037	0.52	0/3	0	0	0	*
	SILVER	MG/KG	0.065	0.085	0.073	0.020	0.070	0.085	0.22	0.0060	0.010	0.00011	0.091	0/3	0	0	0	*
	SODIUM	MG/KG	883	4,200	2,380	3,320	2,070	4,200	7,150	970	1,680	2,820,000	5,220	3/3	*	*	*	*
	THALLIUM	MG/KG	0.22	0.29	0.24	0.070	0.23	0.29	0.73	0.021	0.037	0.0014	0.31	0/3	*	*	*	0
	VANADIUM	MG/KG	54.2	94.7	75.1	40.5	76.4	94.7	225	11.7	20.3	411	109	3/3	*	*	*	0
	ZINC	MG/KG	62.5	424	199	362	109	424	596	114	197	38,700	530	3/3	1	1	1	1

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-2-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial and Aquatic

Analysis	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/KG	14,000	14,000	14,000	0	14,000	14,000	14,000	0	0	0	13	1/1	*	*	*	*
HEXAVALENT CHROMIUM	HEXAVALENT CHROMIUM	UG/KG	25.0	25.0	25.0	0	25.0	25.0	25.0	0	0	0	12.7	0/1	*	*	*	*
LOW LEVEL PESTICIDES AND PCBs	2,4'-DDD	UG/KG	0.7	0.7	0.7	0	0.7	0.7	0.7	0	0	0	13	1/1	*	*	*	*
	2,4'-DDE	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	2,4'-DDT	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	4,4'-DDD	UG/KG	0.6	0.6	0.6	0	0.6	0.6	0.6	0	0	0	13	0/1	*	0	0	*
	4,4'-DDE	UG/KG	0.7	0.7	0.7	0	0.7	0.7	0.7	0	0	0	13	1/1	*	0	0	*
	4,4'-DDT	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	13	0/1	*	0	0	*
	ALDRIN	UG/KG	0.3	0.3	0.3	0	0.3	0.3	0.3	0	0	0	13	1/1	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	2	2	2	0	2	2	2	0	0	0	13	1/1	*	*	*	*
	DIELDRIN	UG/KG	0.4	0.4	0.4	0	0.4	0.4	0.4	0	0	0	13	1/1	0	1	0	*
	GAMMA-BHC (LINDANE)	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	HEPTACHLOR	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	HEXACHLOROBENZENE	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	13	1/1	0	*	*	*
	MIREX	UG/KG	0.3	0.3	0.3	0	0.3	0.3	0.3	0	0	0	13	1/1	*	*	*	*
	PCB-101 (2,2',3,5,5')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	13	1/1	*	*	*	*
	PCB-105 (2,3,3',4,4')	UG/KG	0.3	0.3	0.3	0	0.3	0.3	0.3	0	0	0	13	1/1	*	*	*	*
	PCB-118 (2,3',4,4',5)	UG/KG	0.3	0.3	0.3	0	0.3	0.3	0.3	0	0	0	13	1/1	*	*	*	*
	PCB-126 (3,3',4,4',5)	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-128 (2,2',3,3',4,4')	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-138 (2,2',3,4,4',5')	UG/KG	0.6	0.6	0.6	0	0.6	0.6	0.6	0	0	0	13	1/1	*	*	*	*
	PCB-153 (2,2',4,4',5,5')	UG/KG	0.5	0.5	0.5	0	0.5	0.5	0.5	0	0	0	13	1/1	*	*	*	*
	PCB-170 (2,2',3,3',4,4',5)	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-18 (2,2',5)	UG/KG	0.1	0.1	0.1	0	0.1	0.1	0.1	0	0	0	13	0/1	*	*	*	*
	PCB-180 (2,2',3,4,4',5,5')	UG/KG	0.4	0.4	0.4	0	0.4	0.4	0.4	0	0	0	13	1/1	*	*	*	*
	PCB-187 (2,2',3,4',5,5',6)	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-195 (2,2',3,3',4,4',5,6)	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-206 (2,2',3,3',4,4',5,5',	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	13	1/1	*	*	*	*
	PCB-209 (2,2',3,3',4,4',5,5',6	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-28 (2,4,4')	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-44 (2,2',3,5')	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-52 (2,2',5,5')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	13	1/1	*	*	*	*
	PCB-66 (2,3',4,4')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	13	1/1	*	*	*	*
	PCB-77 (3,3',4,4')	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	PCB-8 (2,4')	UG/KG	0.07	0.07	0.07	0	0.07	0.07	0.07	0	0	0	13	0/1	*	*	*	*
	TOTAL DDTs	UG/KG	2	2	2	0	2	2	2	0	0	0	13	1/1	0	1	0	*
	TOTAL PCBs	UG/KG	4	4	4	0	4	4	4	0	0	0	13	1/1	0	0	0	*
	TRANS-NONACHLOR	UG/KG	2	2	2	0	2	2	2	0	0	0	13	1/1	*	*	*	*
SULFIDE	SULFIDE	MG/KG	260	260	260	0	260	260	260	0	0	0	13	1/1	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-2-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial and Aquatic

Analyte	Analyte	Unit	Concentration											Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	1,1'-BIPHENYL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	1,2,4-TRICHLOROBENZENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	1-METHYLNAPHTHALENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	*	*	*
	1-METHYLPHENANTHRENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2,3,5-TRIMETHYLNAPETHALENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2,4-DICELOROPHENOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2,6-DIMETHYLNAPETHALENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	*	*	*
	2,6-DINITROTOLUENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2-CHLOROPHENOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2-METEYLNAPHTHALENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	0	0	*
	2-METEYLPHENOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	2-NITROANILINE	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	2-NITROPHENOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	3-NITROANILINE	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	4-CHLORC-3-METHYLPHENOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	4-CHLORCANILINE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	4-METHYLPHENOL	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	*	*	*	*
	4-NITRCANILINE	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	4-NITROPHENOL	UG/KG	600	600	600	0	600	600	600	0	0	0	13	0/1	*	*	*	*
	ACENAPHTHENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	0	0	*
	ACENAPHTHYLENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	0	0	*
	ANTHRACENE	UG/KG	230	230	230	0	230	230	230	0	0	0	13	0/1	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	89	89	89	0	89	89	89	0	0	0	13	1/1	0	0	0	*
	BENZO(A)PYRENE	UG/KG	97	97	97	0	97	97	97	0	0	0	13	1/1	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	200	200	200	0	200	200	200	0	0	0	13	1/1	0	*	*	*
	BENZO(E)PYRENE	UG/KG	110	110	110	0	110	110	110	0	0	0	13	1/1	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	110	110	110	0	110	110	110	0	0	0	13	1/1	0	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-2-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL METALS	SILVER	MG/KG	0.050	0.72	0.12	0.66	0.080	0.065	13.5	0.010	0.11	0.012	0.14	8/114	2	0	0	*
	SODIUM	MG/KG	13.5	117,000	11,900	117,000	6,500	21,800	1,360,000	1,640	17,600	308,000,000	14,700	102/114	*	*	*	*
	THALLIUM	MG/KG	0.20	5.4	0.42	5.2	0.28	0.21	47.6	0.052	0.56	0.31	0.50	10/114	*	*	*	2
	VANADIUM	MG/KG	32.3	130	64.9	97.7	63.2	79.1	7,400	1.5	16.4	269	67.5	114/114	*	*	*	4
	ZINC	MG/KG	40.4	959	129	919	100	119	14,700	9.7	104	10,800	145	114/114	25	27	2	5
VOLATILES	1,1,1-TRICHLOROETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	1,1,2,2-TETRACHLOROETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	1,1,2-TRICHLOROETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	1,1-DICHLOROETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	1,1-DICHLOROETHENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	1,2-DICHLOROETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	1,2-DICHLOROETHENE (TOTAL)	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	1,2-DICHLOROPROPANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	2-BUTANONE	UG/KG	6	73	19	67	11	6	380	4	19	380	26	2/20	*	*	*	*
	2-HEXANONE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	4-METHYL-2-PENTANONE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	ACETONE	UG/KG	6	180	59	170	34	12	1,200	14	63	3,900	83	0/20	*	*	*	*
	BENZENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	BROMODICHLOROMETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	BROMOFORM	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	BROMOMETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	CARBON DISULFIDE	UG/KG	6	160	20	150	10	6	400	8	34	1,200	33	4/20	*	*	*	*
	CARBON TETRACHLORIDE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	CHLOROBENZENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	CHLOROETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	CHLOROFORM	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	CHLOROMETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	1/20	*	*	*	*
	CIS-1,3-DICHLOROPROPENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	DIBROMOCHLOROMETHANE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	ETHYLBENZENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	METHYLENE CHLORIDE	UG/KG	6	22	12	16	11	6	230	1	5	22	13	0/20	*	*	*	*
	STYRENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	TETRACHLOROETHENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	TOLUENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	TRANS-1,3-DICHLOROPROPENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	TRICHLOROETHENE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	VINYL CHLORIDE	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*
	XYLENE (TOTAL)	UG/KG	6	22	11	16	10	6	220	1	5	22	13	0/20	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-2-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	400	1,800	880	1,400	830	500	18,000	90	400	160,000	1,000	0/20	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	400	1,800	880	1,400	830	500	18,000	90	400	160,000	1,000	0/20	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2-CHLOROPHENOL	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	0	0	0	*
	2-METHYLPHENOL	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	2-NITROANILINE	UG/KG	400	1,800	880	1,400	830	500	18,000	90	400	160,000	1,000	0/20	*	*	*	*
	2-NITROPHENOL	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	3-NITROANILINE	UG/KG	400	1,800	880	1,400	830	500	18,000	90	400	160,000	1,000	0/20	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	400	1,800	880	1,400	830	500	18,000	90	400	160,000	1,000	0/20	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	4-CHLOROANILINE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	4-METHYLPHENOL	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	4-NITROANILINE	UG/KG	400	1,800	880	1,400	830	500	18,000	90	400	160,000	1,000	0/20	*	*	*	*
	4-NITROPHENOL	UG/KG	400	1,800	880	1,400	830	500	18,000	90	400	160,000	1,000	0/20	*	*	*	*
	ACENAPHTHENE	UG/KG	170	700	380	540	340	550	7,500	38	170	29,000	440	1/20	0	1	1	*
	ACENAPHTHYLENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	0	0	0	*
	ANTHRACENE	UG/KG	170	1,200	400	1,000	340	550	8,100	55	250	60,000	600	1/20	0	1	1	*
	BENZO(A)ANTHRACENE	UG/KG	170	2,000	450	1,800	340	550	9,000	89	400	150,000	600	2/20	0	2	1	*
	BENZO(A)PYRENE	UG/KG	170	1,500	420	1,300	340	550	8,400	67	300	90,000	530	1/20	0	1	0	*
	BENZO(B)FLUORANTHENE	UG/KG	170	2,300	460	2,100	340	550	9,200	100	460	210,000	640	2/20	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	170	700	370	540	340	550	7,400	36	160	26,000	430	1/20	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	170	820	380	650	340	550	7,700	42	190	35,000	460	1/20	0	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	BIS(2-ETHYLHEXYL)PETHALATE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	CARBAZOLE	UG/KG	170	1,100	400	940	340	550	8,000	51	230	52,000	490	1/20	*	*	*	*
	CHRYSENE	UG/KG	170	1,800	440	1,600	340	550	8,800	80	360	130,000	580	2/20	0	1	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	0	0	0	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-2-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	DIBENZOFURAN	UG/KG	170	700	370	540	340	550	7,400	36	160	26,000	430	1/20	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	FLUORANTHENE	UG/KG	170	5,000	610	4,800	360	550	12,000	230	1,000	1,100,000	1,000	2/20	0	2	0	*
	FLUORENE	UG/KG	170	700	370	540	340	550	7,500	37	170	28,000	440	1/20	0	1	1	*
	HEXACHLOROBENZENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	HEXACHLOROETHANE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	1,700	19,000	4,400	17,000	3,400	5,500	89,000	840	3,800	14,000,000	5,900	2/20	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	170	700	370	540	340	550	7,400	36	160	26,000	430	1/20	0	*	*	*
	ISOPHORONE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	1,200	9,100	2,900	7,900	2,400	3,900	57,000	410	1,800	3,300,000	3,600	2/20	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	NAPHTHALENE	UG/KG	170	700	360	540	330	550	7,200	35	160	25,000	420	1/20	0	1	0	*
	NITROBENZENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	400	1,800	880	1,400	830	500	18,000	90	400	160,000	1,000	0/20	*	*	*	*
	PHENANTHRENE	UG/KG	170	5,900	650	5,700	360	550	13,000	280	1,200	1,600,000	1,100	2/20	0	2	1	*
	PHENOL	UG/KG	200	700	390	500	360	550	7,800	36	160	25,000	450	2/20	*	*	*	*
	PYRENE	UG/KG	170	4,300	580	4,100	360	550	12,000	200	890	790,000	920	2/20	0	1	1	*
	TOTAL PAHs	UG/KG	2,800	28,000	7,300	25,000	5,700	9,400	150,000	1,200	5,600	31,000,000	9,400	2/20	0	2	0	*
TOTAL METALS	ALUMINUM	MG/KG	4,420	33,700	17,700	29,300	16,600	17,600	2,020,000	583	6,230	38,800,000	18,700	114/114	*	*	*	9
	ANTIMONY	MG/KG	0.22	5.6	1.1	5.4	0.87	1.2	122	0.077	0.82	0.67	1.2	69/113	*	16	0	11
	ARSENIC	MG/KG	1.3	42.0	11.6	40.8	9.6	9.0	1,320	0.67	7.2	51.5	12.7	109/114	25	74	0	5
	BARIUM	MG/KG	25.7	7,710	199	7,680	122	140	22,600	66.8	713	509,000	310	114/114	*	*	*	1
	BERYLLIUM	MG/KG	0.010	1.5	0.086	1.5	0.025	0.010	9.8	0.016	0.17	0.029	0.11	16/114	*	*	*	11
	CADMIUM	MG/KG	0.020	3.0	0.074	3.0	0.025	0.025	8.4	0.028	0.29	0.086	0.12	3/114	3	0	0	0
	CALCIUM	MG/KG	1,870	45,900	8,300	44,000	5,020	13,500	946,000	799	8,530	72,800,000	9,520	114/114	*	*	*	*
	CHROMIUM	MG/KG	10.2	101	52.4	90.8	49.5	38.3	5,980	2.0	21.7	479	55.8	107/114	0	13	0	11
	COBALT	MG/KG	3.7	108	15.7	104	14.2	14.5	1,790	0.96	10.2	105	17.3	114/114	*	*	*	2
	COPPER	MG/KG	13.0	87.8	40.7	74.8	36.5	51.7	4,640	1.6	16.7	280	43.3	114/114	12	70	0	2
	IRON	MG/KG	12,300	73,200	28,900	60,900	27,000	40,000	3,290,000	943	10,100	101,000,000	30,500	114/114	*	*	*	*
	LEAD	MG/KG	2.9	1,160	66.6	1,160	40.1	9.5	7,590	11.2	120	14,400	85.2	113/114	54	49	5	19
	MAGNESIUM	MG/KG	4,670	27,400	11,000	22,700	10,800	10,100	1,250,000	314	3,350	11,200,000	11,500	114/114	*	*	*	*
	MANGANESE	MG/KG	59.0	6,300	541	6,240	419	669	61,700	57.8	617	381,000	637	114/114	*	*	*	2
	MERCURY	MG/KG	0.025	0.58	0.15	0.56	0.11	0.070	17.4	0.012	0.12	0.015	0.17	79/114	4	42	0	15
	MOLYBDENUM	MG/KG	0.090	17.8	1.1	17.7	0.18	0.095	128	0.21	2.3	5.2	1.5	33/114	*	*	*	2
	NICKEL	MG/KG	25.0	242	69.9	217	67.3	80.8	7,960	2.4	25.9	672	73.9	114/114	6	114	94	5
	POTASSIUM	MG/KG	1,720	10,600	4,500	8,880	4,410	3,270	513,000	164	1,750	3,080,000	4,770	114/114	*	*	*	*
	SELENIUM	MG/KG	0.35	2.8	0.55	2.5	0.46	0.55	62.9	0.030	0.32	0.10	0.60	3/114	3	3	1	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-2-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial

Analyses	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SULFIDE	SULFIDE	MG/KG	5	390	17	385	7	5	1,200	6	50	2,500	27	5/71	*	*	*	*
LOW LEVEL SEMIVOLATILES	1,1'-BIPHENYL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	1,2,4-TRICHLOROBENZENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	1,2-DICELCROBENZENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	1,3-DICELCROBENZENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	1,4-DICHLCROBENZENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	1-METHYLNAPHTHALENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	0	*	*	*
	1-METHYLPHENANTHRENE	UG/KG	17	320	64	300	41	18	3,400	9	63	3,900	78	1/54	0	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	2,3,5-TRIMETHYLNAPHTHALENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	0	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	43	800	160	760	110	65	6,800	22	160	26,000	200	0/54	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	78	1/54	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	43	800	160	760	110	65	6,800	22	160	26,000	200	0/54	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	2,6-DIMETHYLNAPHTHALENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	0	*	*	*
	2,6-DINITROTOLUENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	2-CHLOROPHENOL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	0	0	0	*
	2-METHYLPHENOL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	2-NITROANILINE	UG/KG	43	800	160	760	110	65	6,800	22	160	26,000	200	0/54	*	*	*	*
	2-NITROPHENOL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	3-NITROANILINE	UG/KG	43	800	160	760	110	65	6,800	22	160	26,000	200	0/54	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	43	800	160	760	110	65	6,800	22	160	26,000	200	0/54	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	4-CHLCROANILINE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	4-CHLCROPHENYL-PHENYLETHER	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	4-METHYLPHENOL	UG/KG	17	280	64	260	43	18	3,400	8	60	3,600	77	2/54	*	*	*	*
	4-NITROANILINE	UG/KG	43	800	160	760	110	65	8,800	22	160	26,000	200	0/54	*	*	*	*
	4-NITROPHENOL	UG/KG	43	800	160	760	110	60	8,700	22	160	26,000	200	0/53	*	*	*	*
	ACENAPHTHENE	UG/KG	15	320	62	300	39	18	3,400	9	63	4,000	77	2/54	0	1	0	*
	ACENAPHTHYLENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	0	0	0	*
	ANTHRACENE	UG/KG	17	320	63	300	43	18	3,500	9	63	3,900	79	2/54	0	1	0	*
	BENZO(A)ANTHRACENE	UG/KG	12	440	69	430	43	18	3,700	11	83	6,900	87	7/54	0	2	0	*
	BENZO(A)PYRENE	UG/KG	13	320	66	310	41	18	3,600	10	71	5,000	82	8/54	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	6	390	71	380	42	18	3,800	11	83	6,900	90	9/54	0	*	*	*
	BENZO(E)PYRENE	UG/KG	11	320	63	300	41	18	3,400	8	62	3,800	77	7/54	0	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-2-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

R Area Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	BENZO(G,H,I)PERYLENE	UG/KG	15	320	65	300	41	18	3,500	9	64	4,100	80	7/54	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	11	320	68	310	43	18	3,700	10	73	5,400	85	6/54	0	*	*	*
	BENZOIC ACID	UG/KG	18	920	170	900	110	120	9,000	23	170	28,000	210	12/54	*	*	*	*
	BENZYL ALCOHOL	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	18	320	73	300	46	18	3,900	9	69	4,800	88	2/54	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	CARBAZOLE	UG/KG	17	320	63	300	40	18	3,400	9	63	3,900	77	2/54	*	*	*	*
	CHRYSENE	UG/KG	6	440	73	430	43	18	3,900	12	90	8,200	93	11/54	0	2	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	18	320	65	300	43	50	3,500	8	62	3,900	79	0/54	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	10	320	60	310	41	18	3,200	8	59	3,400	73	5/54	0	2	0	*
	DIBENZOFURAN	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	DIBENZOTHIOPHENE	UG/KG	17	320	63	300	41	18	3,400	9	63	3,900	78	1/54	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	17	320	67	300	44	18	3,600	9	64	4,000	81	1/54	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	FLUORANTHENE	UG/KG	10	1,100	88	1,100	39	18	4,800	23	170	30,000	130	12/54	0	2	0	*
	FLUORENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	17	320	65	300	43	18	3,400	9	63	4,000	79	0/53	*	*	*	*
	HEXACHLOROETHANE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	200	4,500	830	4,300	490	210	45,000	120	920	840,000	1,000	13/54	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	12	320	65	300	41	18	3,500	9	64	4,100	79	7/54	0	*	*	*
	ISOPHORONE	UG/KG	17	320	65	300	43	18	3,500	8	62	3,900	79	1/54	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	170	3,200	650	3,000	430	180	35,000	84	610	380,000	790	7/54	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	NAPHTHALENE	UG/KG	17	320	63	300	41	18	3,400	9	63	3,900	78	1/54	0	0	0	*
	NITROBENZENE	UG/KG	17	320	64	300	43	18	3,500	9	62	3,900	79	0/54	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	43	800	160	760	110	65	8,800	22	160	26,000	200	0/54	*	*	*	*
	PERYLENE	UG/KG	9	320	62	310	43	18	3,300	8	59	3,500	76	4/54	0	*	*	*
	PHENANTHRENE	UG/KG	7	660	72	650	43	18	3,900	14	100	11,000	95	7/54	0	2	0	*
	PHENOL	UG/KG	17	320	64	300	43	18	3,500	8	62	3,900	79	0/54	*	*	*	*
	PYRENE	UG/KG	6	680	79	670	41	18	4,200	17	120	15,000	110	11/54	0	1	0	*
	TOTAL PAHs	UG/KG	370	6,900	1,600	6,600	960	390	84,000	210	1,600	2,400,000	1,900	13/54	0	3	0	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	170	700	350	540	330	550	7,100	36	160	26,000	420	0/20	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-2-C

Statistical Summary of Surface Water Results

R Area Disposal Site (Site 9)

Analysis	Analyte	Units	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SCA Guidance Value
VOLATILES	TOLUENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	TRANS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	TRICHLOROETHENE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	VINYL CHLORIDE	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*
	XYLENE (TOTAL)	UG/L	5	5	5	0	5	5	75	0	0	0	5	0/15	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-3-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/KG	3,700	13,000	8,600	9,700	8,600	13,000	17,000	4,800	6,800	47,000,000	39,000	2/2	*	*	*	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	1,3-DINITROBENZENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	2,4,6-TRINITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	2-NITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	3-NITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	4-NITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	HMX	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	NITROBENZENE	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	RDX	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
	TETRYL	UG/KG	60	60	60	0	60	60	60	0	0	0	39,000	0/1	*	*	*	*
LOW LEVEL PESTICIDES AND PCBs	2,4'-DDD	UG/KG	0.3	0.3	0.3	0	0.3	0.3	0.3	0	0	0	39,000	1/1	*	*	*	*
	2,4'-DDE	UG/KG	0.5	0.5	0.5	0	0.5	0.5	0.5	0	0	0	39,000	1/1	*	*	*	*
	2,4'-DDT	UG/KG	2	2	2	0	2	2	2	0	0	0	39,000	1/1	*	*	*	*
	4,4'-DDD	UG/KG	4	4	4	0	4	4	4	0	0	0	39,000	1/1	*	1	0	*
	4,4'-DDE	UG/KG	15	15	15	0	15	15	15	0	0	0	39,000	1/1	*	1	0	*
	4,4'-DDT	UG/KG	19	19	19	0	19	19	19	0	0	0	39,000	1/1	*	1	1	*
	ALDRIN	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	3	3	3	0	3	3	3	0	0	0	39,000	1/1	*	*	*	*
	DIELDRIN	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	0	0	0	*
	GAMMA-BHC (LINDANE)	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	HEPTACHLOR	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	HEXACHLOROBENZENE	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	0	*	*	*
	MIREX	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-101 (2,2',3,5,5')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-105 (2,3,3',4,4')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-118 (2,3',4,4',5)	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-126 (3,3',4,4',5)	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-128 (2,2',3,3',4,4')	UG/KG	2	2	2	0	2	2	2	0	0	0	39,000	1/1	*	*	*	*
	PCB-138 (2,2',3,4,4',5')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-153 (2,2',4,4',5,5')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-170 (2,2',3,3',4,4',5)	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-18 (2,2',5)	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-180 (2,2',3,4,4',5,5')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-187 (2,2',3,4',5,5',6)	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-195 (2,2',3,3',4,4',5,6)	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-206 (2,2,',3,3',4,4',5,5',	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-209 (2,2',3,3',4,4',5,5',6	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-3-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Terrestrial

Analyte Class	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM
LOW LEVEL PESTICIDES AND PCBs	PCB-28 (2,4,4')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-44 (2,2',3,5')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-52 (2,2',5,5')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-66 (2,3',4,4')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-77 (3,3',4,4')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	PCB-8 (2,4')	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0	0	39,000	0/1	*	*	*	*
	TECHNICAL CHLORDANE	UG/KG	21	190	110	170	110	190	210	85	120	14,000	640	2/2	*	*	*	*
	TOTAL DDTs	UG/KG	41	41	41	0	41	41	41	0	0	0	640	1/1	0	1	0	*
	TOTAL PCBs	UG/KG	6	6	6	0	6	6	6	0	0	0	640	1/1	0	0	0	*
	TRANS-NONACHLOR	UG/KG	4	4	4	0	4	4	4	0	0	0	640	1/1	*	*	*	*
PESTICIDES AND PCBs	4,4'-DDD	UG/KG	37	37	37	0	37	37	37	0	0	0	640	0/1	*	0	0	*
	4,4'-DDE	UG/KG	10	10	10	0	10	10	10	0	0	0	640	1/1	*	1	0	*
	4,4'-DDT	UG/KG	9	9	9	0	9	9	9	0	0	0	640	1/1	*	1	1	*
	ALDRIN	UG/KG	18	18	18	0	18	18	18	0	0	0	640	0/1	*	*	*	*
	ALPHA-BHC	UG/KG	18	18	18	0	18	18	18	0	0	0	640	0/1	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	35	35	35	0	35	35	35	0	0	0	640	1/1	*	*	*	*
	AROCLOR-1016	UG/KG	370	370	370	0	370	370	370	0	0	0	640	0/1	*	*	*	*
	AROCLOR-1221	UG/KG	750	750	750	0	750	750	750	0	0	0	640	0/1	*	*	*	*
	AROCLOR-1232	UG/KG	370	370	370	0	370	370	370	0	0	0	640	0/1	*	*	*	*
	AROCLOR-1242	UG/KG	370	370	370	0	370	370	370	0	0	0	640	0/1	*	*	*	*
	AROCLOR-1248	UG/KG	370	370	370	0	370	370	370	0	0	0	640	0/1	*	*	*	*
	AROCLOR-1254	UG/KG	370	370	370	0	370	370	370	0	0	0	640	0/1	*	*	*	*
	AROCLOR-1260	UG/KG	370	370	370	0	370	370	370	0	0	0	640	0/1	*	*	*	*
	BETA-BHC	UG/KG	18	18	18	0	18	18	18	0	0	0	640	0/1	*	*	*	*
	DELTA-BHC	UG/KG	18	18	18	0	18	18	18	0	0	0	640	0/1	*	*	*	*
	DIELDRIN	UG/KG	37	37	37	0	37	37	37	0	0	0	640	0/1	0	0	0	*
	ENDOSULFAN I	UG/KG	18	18	18	0	18	18	18	0	0	0	640	0/1	*	*	*	*
	ENDOSULFAN II	UG/KG	37	37	37	0	37	37	37	0	0	0	640	0/1	*	*	*	*
	ENDOSULFAN SULFATE	UG/KG	37	37	37	0	37	37	37	0	0	0	640	0/1	*	*	*	*
	ENDRIN	UG/KG	37	37	37	0	37	37	37	0	0	0	640	0/1	*	0	0	*
	ENDRIN ALDEHYDE	UG/KG	37	37	37	0	37	37	37	0	0	0	640	0/1	*	*	*	*
	ENDRIN KETONE	UG/KG	37	37	37	0	37	37	37	0	0	0	640	0/1	*	*	*	*
	GAMMA-BHC (LINDANE)	UG/KG	18	18	18	0	18	18	18	0	0	0	640	0/1	*	*	*	*
	GAMMA-CHLORDANE	UG/KG	25	25	25	0	25	25	25	0	0	0	640	1/1	*	*	*	*
	HEPTACHLOR	UG/KG	18	18	18	0	18	18	18	0	0	0	640	0/1	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	18	18	18	0	18	18	18	0	0	0	640	0/1	*	*	*	*
	METHOXYCHLOR	UG/KG	180	180	180	0	180	180	180	0	0	0	640	0/1	*	*	*	*
	TOTAL DDTs	UG/KG	55	55	55	0	55	55	55	0	0	0	640	1/1	0	1	1	*
	TOTAL PCBs	UG/KG	2,900	2,900	2,900	0	2,900	2,900	2,900	0	0	0	640	0/1	0	0	0	*
	TOXAPHENE	UG/KG	1,800	1,800	1,800	0	1,800	1,800	1,800	0	0	0	640	0/1	*	*	*	*
SULFIDE	SULFIDE	MG/KG	28	30	29	2	29	30	58	1	1	2	35	0/2	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-3-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	1,1'-BIPHENYL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	1,2,4-TRICHLOROBENZENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	1,2-DICELOROBENZENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	1,3-DICHLORCBENZENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	1-METHYLNAPHTHALENE	UG/KG	5	5	5	0	5	5	5	0	0	0	35	1/1	0	*	*	*
	1-METHYLPHENANTHRENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	2,3,5-TRIMETHYLNAPHTHALENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	50	50	50	0	50	50	50	0	0	0	35	0/1	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	5	5	5	0	5	5	5	0	0	0	35	1/1	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	50	50	50	0	50	50	50	0	0	0	35	0/1	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	2,6-DIMETHYLNAPHTHALENE	UG/KG	5	5	5	0	5	5	5	0	0	0	35	1/1	0	*	*	*
	2,6-DINITROTOLUENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	2-CHLOROPHENOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	9	9	9	0	9	9	9	0	0	0	35	1/1	0	0	0	*
	2-METHYLPHENOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	2-NITROANILINE	UG/KG	50	50	50	0	50	50	50	0	0	0	35	0/1	*	*	*	*
	2-NITROPHENOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	3-NITROANILINE	UG/KG	50	50	50	0	50	50	50	0	0	0	35	0/1	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	50	50	50	0	50	50	50	0	0	0	35	0/1	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	4-CHLOROANILINE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	4-METHYLPHENOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	4-NITROANILINE	UG/KG	50	50	50	0	50	50	50	0	0	0	35	0/1	*	*	*	*
	4-NITROPHENOL	UG/KG	50	50	50	0	50	50	50	0	0	0	35	0/1	0	0	0	*
	ACENAPHTHENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	ACENAPHTHYLENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	ANTHRACENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	BENZO(A)PYRENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*
	BENZO(E)PYRENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-3-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Terrestrial

Analyte(s)	Analyte	Unit	Concentration											Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	BENZO(K)FLUORANTHENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*
	BENZOIC ACID	UG/KG	24	24	24	0	24	24	24	0	0	0	35	1/1	*	*	*	*
	BENZYL ALCOHOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	CARBAZOLE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	CERYSENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	DIBENZOFURAN	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	DIBENZOTHIOPHENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	FLUORANTHENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	FLUORENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	HEXACHLOROETHANE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	250	250	250	0	250	250	250	0	0	0	35	0/1	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*
	ISOPHORONE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	180	180	180	0	180	180	180	0	0	0	35	1/1	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	NAPHTHALENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	NITROBENZENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	PERYLENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	*	*	*
	PHENANTHRENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	PHENOL	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	*	*	*	*
	PYRENE	UG/KG	21	21	21	0	21	21	21	0	0	0	35	0/1	0	0	0	*
	TOTAL PAHs	UG/KG	670	670	670	0	670	670	670	0	0	0	35	1/1	0	0	0	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	900	900	900	0	900	900	900	0	0	0	35	0/1	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-3-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Terrestrial

Analysis	Analyte	Unit	Concentration											Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	2,4,6-TRICHLOROPHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2,4-DICELOROPHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	900	900	900	0	900	900	900	0	0	0	35	0/1	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2-CHLOROPHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	2-METHYLNAPHTHALENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2-METHYLPHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	2-NITROANILINE	UG/KG	900	900	900	0	900	900	900	0	0	0	35	0/1	*	*	*	*
	2-NITROPHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	3-NITROANILINE	UG/KG	900	900	900	0	900	900	900	0	0	0	35	0/1	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	900	900	900	0	900	900	900	0	0	0	35	0/1	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	4-CHLOROANILINE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	4-METHYLPHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	4-NITROANILINE	UG/KG	900	900	900	0	900	900	900	0	0	0	35	0/1	*	*	*	*
	4-NITROPHENOL	UG/KG	900	900	900	0	900	900	900	0	0	0	35	0/1	*	*	*	*
	ACENAPHTEENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	ACENAPHTYLENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	ANTHRACENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	BENZO(A)ANTERACENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	BENZO(A)PYRENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	CARBAZOLE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	CHRYSENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	DIBENZOFURAN	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-3-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	DIMETHYLPHTHALATE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	FLUORANTHENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	FLUORENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	HEXACHLOROETHANE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	3,600	3,600	3,600	0	3,600	3,600	3,600	0	0	0	35	0/1	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	*	*	*
	ISOPHORONE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	2,500	2,500	2,500	0	2,500	2,500	2,500	0	0	0	35	0/1	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	NAPHTHALENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	NITROBENZENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	900	900	900	0	900	900	900	0	0	0	35	0/1	*	*	*	*
	PHENANTHRENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	PHENOL	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	*	*	*	*
	PYRENE	UG/KG	360	360	360	0	360	360	360	0	0	0	35	0/1	0	0	0	*
	TOTAL PAHs	UG/KG	6,100	6,100	6,100	0	6,100	6,100	6,100	0	0	0	35	0/1	0	0	0	*
TOTAL METALS	ALUMINUM	MG/KG	9,200	14,900	12,100	5,700	12,100	14,900	24,100	2,850	4,030	16,200,000	30,300	2/2	*	*	*	0
	ARSENIC	MG/KG	0.55	4.5	2.5	4.0	2.5	4.5	5.1	2.0	2.8	7.8	15.0	1/2	0	0	0	0
	BARIUM	MG/KG	43.8	165	104	121	104	165	209	60.6	85.7	7,340	487	2/2	*	*	*	0
	BERYLLIUM	MG/KG	0.010	0.015	0.013	0.0050	0.013	0.015	0.025	0.0025	0.0035	0.000010	0.028	0/2	*	*	*	0
	CADMIUM	MG/KG	0.020	0.38	0.20	0.36	0.20	0.38	0.40	0.18	0.25	0.065	1.3	1/2	1	0	0	0
	CALCIUM	MG/KG	6,200	12,000	9,100	5,800	9,100	12,000	18,200	2,900	4,100	16,800,000	27,400	2/2	*	*	*	*
	CHROMIUM	MG/KG	15.3	34.2	24.8	18.9	24.8	34.2	49.5	9.5	13.4	179	84.4	2/2	0	0	0	0
	COBALT	MG/KG	7.4	12.9	10.2	5.5	10.2	12.9	20.3	2.8	3.9	15.1	27.5	2/2	*	*	*	0
	COPPER	MG/KG	21.4	30.3	25.9	8.9	25.9	30.3	51.7	4.5	6.3	39.6	53.9	2/2	0	0	0	0
	IRON	MG/KG	11,900	19,500	15,700	7,600	15,700	19,500	31,400	3,800	5,370	28,900,000	39,700	2/2	*	*	*	*
	LEAD	MG/KG	8.8	72.0	40.4	63.2	40.4	72.0	80.8	31.6	44.7	2,000	240	2/2	1	1	0	0
	MAGNESIUM	MG/KG	3,890	6,530	5,210	2,640	5,210	6,530	10,400	1,320	1,870	3,480,000	13,500	2/2	*	*	*	*
	MANGANESE	MG/KG	227	608	418	381	418	608	835	191	269	72,600	1,620	2/2	*	*	*	0
	MERCURY	MG/KG	0.17	0.25	0.21	0.080	0.21	0.25	0.42	0.040	0.057	0.0032	0.45	2/2	0	2	0	0
	MOLYBDENUM	MG/KG	0.12	0.15	0.13	0.035	0.13	0.15	0.27	0.018	0.025	0.00061	0.24	0/2	*	*	*	0
	NICKEL	MG/KG	15.6	38.0	26.8	22.4	26.8	38.0	53.6	11.2	15.8	251	97.5	2/2	0	1	0	0
	POTASSIUM	MG/KG	823	1,860	1,340	1,040	1,340	1,860	2,680	519	733	538,000	4,620	2/2	*	*	*	*
	SELENIUM	MG/KG	0.37	0.44	0.41	0.070	0.41	0.44	0.81	0.035	0.050	0.0025	0.63	0/2	0	0	0	*
	SILVER	MG/KG	0.065	0.075	0.070	0.010	0.070	0.075	0.14	0.0050	0.0071	0.000050	0.10	0/2	0	0	0	*
	SODIUM	MG/KG	1,160	1,610	1,390	450	1,390	1,610	2,770	225	318	101,000	2,810	2/2	*	*	*	*
	THALLIUM	MG/KG	0.26	0.64	0.45	0.38	0.45	0.64	0.90	0.19	0.27	0.072	1.6	1/2	*	*	*	0

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-3-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Terrestrial

Analysis	Analyte	Unit	Concentration											Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL METALS	VANADIUM	MG/KG	34.4	54.7	44.6	20.3	44.6	54.7	89.1	10.2	14.4	206	109	2/2	*	*	*	0
	ZINC	MG/KG	27.5	106	66.8	78.5	66.8	106	134	39.3	55.5	3,080	315	2/2	0	0	0	0
TPH EXTRACTABLES	DIESEL RANGE ORGANICS	MG/KG	7	700	350	690	350	700	710	350	490	240,000	2,500	0/2	*	*	*	*
	MOTOR OIL RANGE ORGANICS	MG/KG	54	9,200	4,600	9,100	4,600	9,200	9,300	4,600	6,500	42,000,000	34,000	2/2	*	*	*	*
VOLATILES	1,1,1-TRICHLOROETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	1,1,2,2-TETRACHLOROETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	1,1,2-TRICHLOROETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	1,1-DICHLOROETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	1,1-DICHLOROETHENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	1,2-DICHLOROETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	1,2-DICHLOROETHENE (TOTAL)	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	1,2-DICHLOROPROPANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	2-BUTANONE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	2-HEXANONE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	4-METHYL-2-PENTANONE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	ACETONE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	BENZENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	BROMODICHLOROMETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	BROMOFORM	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	BROMOMETEANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	CARBON DISULFIDE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	CARBON TETRACHLORIDE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	CHLOROBENZENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	CHLOROETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	CHLOROFORM	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	CHLOROMETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	CIS-1,3-DICHLOROPROPENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	DIBROMOCHLOROMETHANE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	ETHYLBENZENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	METHYLENE CHLORIDE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	STYRENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	TETRACHLOROETHENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	TOLUENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	TRANS-1,3-DICHLOROPROPENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	TRICHLOROETHENE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	VINYL CHLORIDE	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*
	XYLENE (TOTAL)	UG/KG	6	6	6	0	6	6	6	0	0	0	0	34,000	0/1	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-3-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Aquatic

Analysis	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/KG	63	330,000	97,000	330,000	61,000	330,000	1,500,000	26,000	100,000	11,000,000,000	140,000	14/16	*	*	*	*
HEXAVALENT CHROMIUM	HEXAVALENT CHROMIUM	UG/KG	25.0	125	75.0	100	75.0	125	150	50.0	70.7	5,000	391	0/2	*	*	*	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	1,3-DINITROBENZENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	2,4,6-TRINITROTOLUENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	2-NITROTOLUENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	3-NITROTOLUENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	4-NITROTOLUENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	HMX	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	NITROBENZENE	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	RDX	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
	TETRYL	UG/KG	60	60	60	0	60	60	480	0	0	0	60	0/8	*	*	*	*
LOW LEVEL PESTICIDES AND PCBs	2,4'-DDD	UG/KG	0.05	5	0.8	5	0.1	0.1	7	0.6	2	3	2	2/8	*	*	*	*
	2,4'-DDE	UG/KG	0.05	0.6	0.2	0.5	0.1	0.1	2	0.07	0.2	0.04	0.4	2/8	*	*	*	*
	2,4'-DDT	UG/KG	0.05	2	0.5	2	0.1	0.1	4	0.2	0.7	0.5	0.9	2/8	*	*	*	*
	4,4'-DDD	UG/KG	0.05	10	3	10	1	10	25	1	4	17	6	5/8	*	4	0	*
	4,4'-DDE	UG/KG	0.05	3	0.9	3	0.5	0.6	7	0.4	1	1	2	5/8	*	1	0	*
	4,4'-DDT	UG/KG	0.05	8	2	8	0.2	0.1	13	1	3	8	4	3/8	*	2	1	*
	ALDRIN	UG/KG	0.05	0.4	0.2	0.4	0.1	0.1	1	0.04	0.1	0.01	0.2	1/8	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	0.05	2	0.6	2	0.3	0.3	5	0.2	0.6	0.4	1	5/8	*	*	*	*
	DIELDRIN	UG/KG	0.05	0.8	0.2	0.8	0.1	0.1	2	0.09	0.3	0.06	0.4	2/8	0	2	0	*
	GAMMA-BHC (LINDANE)	UG/KG	0.05	0.4	0.2	0.4	0.1	0.1	1	0.04	0.1	0.01	0.2	1/8	*	*	*	*
	HEPTACHLOR	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	HEXACHLOROBENZENE	UG/KG	0.05	0.5	0.2	0.5	0.1	0.1	1	0.05	0.1	0.02	0.3	1/8	0	*	*	*
	MIREX	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	PCB-101 (2,2',3,5,5')	UG/KG	0.05	0.4	0.2	0.4	0.1	0.1	1	0.04	0.1	0.01	0.2	2/8	*	*	*	*
	PCB-105 (2,3,3',4,4')	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.07	0.004	0.2	1/8	*	*	*	*
	PCB-118 (2,3',4,4',5)	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.07	0.004	0.2	2/8	*	*	*	*
	PCB-126 (3,3',4,4',5)	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	2/8	*	*	*	*
	PCB-128 (2,2',3,3',4,4')	UG/KG	0.05	0.3	0.1	0.3	0.1	0.1	1	0.03	0.09	0.007	0.2	2/8	*	*	*	*
	PCB-138 (2,2',3,4,4',5')	UG/KG	0.05	2	0.4	2	0.2	0.1	3	0.2	0.6	0.4	0.9	3/8	*	*	*	*
	PCB-153 (2,2',4,4',5,5')	UG/KG	0.05	0.5	0.2	0.5	0.1	0.1	1	0.05	0.1	0.02	0.3	3/8	*	*	*	*
	PCB-170 (2,2',3,3',4,4',5)	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	PCB-18 (2,2',5)	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	PCB-180 (2,2',3,4,4',5,5')	UG/KG	0.05	0.4	0.2	0.4	0.1	0.1	1	0.04	0.1	0.01	0.2	3/8	*	*	*	*
	PCB-187 (2,2',3,4',5,5',6)	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.07	0.005	0.2	2/8	*	*	*	*
	PCB-195 (2,2',3,3',4,4',5,6)	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-3-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Aquatic

Analysis	Analyte	Units	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	<=Ambient
LOW LEVEL PESTICIDES AND PCBs	PCB-206 (2,2',3,3',4,4',5,5',	UG/KG	0.05	0.8	0.3	0.8	0.2	0.2	2	0.09	0.2	0.06	0.4	4/8	*	*	*	*
	PCB-209 (2,2',3,3',4,4',5,5',6	UG/KG	0.05	0.3	0.1	0.3	0.1	0.1	1	0.03	0.09	0.008	0.2	2/8	*	*	*	*
	PCB-28 (2,4,4')	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	PCB-44 (2,2',3,5')	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	PCB-52 (2,2',5,5')	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	PCB-66 (2,3',4,4')	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	PCB-77 (3,3',4,4')	UG/KG	0.05	0.3	0.1	0.3	0.1	0.1	1	0.03	0.09	0.007	0.2	1/8	*	*	*	*
	PCB-8 (2,4')	UG/KG	0.05	0.3	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/8	*	*	*	*
	TOTAL DDTs	UG/KG	0.3	27	7	26	3	27	57	3	9	84	13	5/8	0	4	0	*
	TOTAL PCBs	UG/KG	1	6	3	5	3	6	25	0.6	2	3	4	4/8	0	0	0	*
	TRANS-NONACHLOR	UG/KG	0.05	2	0.5	2	0.3	2	4	0.2	0.6	0.4	0.9	5/8	*	*	*	*
PESTICIDES AND PCBs	4,4'-DDD	UG/KG	2	10	5	8	4	10	41	1	3	9	7	1/8	*	1	0	*
	4,4'-DDE	UG/KG	2	10	5	8	4	8	40	1	3	9	7	0/8	*	0	0	*
	4,4'-DDT	UG/KG	2	10	5	8	4	8	40	1	3	9	7	0/8	*	0	0	*
	ALDRIN	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	ALPHA-BHC	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	AROCLOR-1016	UG/KG	10	95	49	85	39	80	390	11	32	990	70	0/8	*	*	*	*
	AROCLOR-1221	UG/KG	10	190	97	180	78	160	780	23	65	4,200	140	0/8	*	*	*	*
	AROCLOR-1232	UG/KG	10	95	49	85	39	80	390	11	32	990	70	0/8	*	*	*	*
	AROCLOR-1242	UG/KG	10	95	49	85	39	80	390	11	32	990	70	0/8	*	*	*	*
	AROCLOR-1248	UG/KG	10	95	49	85	39	80	390	11	32	990	70	0/8	*	*	*	*
	AROCLOR-1254	UG/KG	10	95	49	85	39	80	390	11	32	990	70	0/8	*	*	*	*
	AROCLOR-1260	UG/KG	10	95	49	85	39	80	390	11	32	990	70	0/8	*	*	*	*
	BETA-BHC	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	DELTA-BHC	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	DIELDRIN	UG/KG	2	10	5	8	4	8	40	1	3	9	7	0/8	0	0	0	*
	ENDOSULFAN I	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	ENDOSULFAN II	UG/KG	2	10	5	8	4	8	40	1	3	9	7	0/8	*	*	*	*
	ENDOSULFAN SULFATE	UG/KG	2	10	5	8	4	8	40	1	3	9	7	0/8	*	*	*	*
	ENDRIN	UG/KG	2	10	5	8	4	8	40	1	3	9	7	0/8	*	0	0	*
	ENDRIN ALDEHYDE	UG/KG	2	10	5	8	4	8	40	1	3	9	7	0/8	*	*	*	*
	ENDRIN KETONE	UG/KG	2	10	5	8	4	8	40	1	3	9	7	0/8	*	*	*	*
	GAMMA-BHC (LINDANE)	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	GAMMA-CHLORDANE	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	HEPTACHLOR	UG/KG	1	5	3	4	2	5	20	0.5	1	2	4	0/8	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.2	5	2	5	2	5	19	0.6	2	3	4	0/8	*	*	*	*
	METHOXYCHLOR	UG/KG	10	48	25	38	20	48	200	5	15	220	35	0/8	*	*	*	*
	TOTAL DDTs	UG/KG	6	29	15	23	12	29	120	3	9	81	21	1/8	0	1	0	*
	TOTAL PCBs	UG/KG	70	760	390	690	310	640	3,100	90	250	65,000	560	0/8	0	0	0	*
	TOXAPHENE	UG/KG	60	480	250	420	200	480	2,000	55	160	24,000	350	0/8	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-3-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Aquatic

Analysis	Analyte	Unit	Concentration											Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	<=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SULFIDE	SULFIDE	MG/KG	30	1,000	120	1,000	43	36	1,900	61	250	60,000	230	1/16	*	*	*	*
LOW LEVEL SEMIVOLATILES	1,1'-BIPHENYL	UG/KG	9	330	110	320	110	330	920	37	100	11,000	180	1/8	*	*	*	*
	1,2,4-TRICHLOROBENZENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	1-METHYLNAPHTHALENE	UG/KG	21	330	120	310	110	330	940	36	100	10,000	190	1/8	0	*	*	*
	1-METHYLPHENANTHRENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	0	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	2,3,5-TRIMETHYLNAPHTHALENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	0	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	50	800	290	750	270	800	2,300	88	250	62,000	450	0/8	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	12	330	120	320	110	330	920	37	100	11,000	190	1/8	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	50	800	290	750	270	800	2,300	88	250	62,000	450	0/8	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	2,6-DIMETHYLNAPHTHALENE	UG/KG	21	330	100	310	71	330	830	27	110	11,000	170	2/8	0	*	*	*
	2,6-DINITROTOLUENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	2-CHLOROPHENOL	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	21	330	120	310	110	330	950	35	100	10,000	190	1/8	0	0	0	*
	2-METHYLPHENOL	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	2-NITROANILINE	UG/KG	50	800	290	750	270	800	2,300	88	250	62,000	450	0/8	*	*	*	*
	2-NITROPHENOL	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	3-NITROANILINE	UG/KG	50	800	290	750	270	800	2,300	88	250	62,000	450	0/8	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	50	800	290	750	270	800	2,300	88	250	62,000	450	0/8	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	4-CHLOROANILINE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	4-METEYLPHENOL	UG/KG	5	330	110	330	110	330	910	37	110	11,000	180	1/8	*	*	*	*
	4-NITROANILINE	UG/KG	50	800	290	750	270	800	2,300	88	250	62,000	450	0/8	*	*	*	*
	4-NITROPHENOL	UG/KG	50	800	290	750	270	800	2,300	88	250	62,000	450	0/8	*	*	*	*
	ACENAPHTHENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	0	0	0	*
	ACENAPHTHYLENE	UG/KG	21	330	110	310	74	330	860	38	110	12,000	180	1/8	0	0	0	*
	ANTHRACENE	UG/KG	21	330	110	310	76	330	870	38	110	11,000	180	1/8	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	21	330	90	310	54	330	720	36	100	10,000	160	3/8	0	0	0	*
	BENZO(A)PYRENE	UG/KG	21	330	120	310	120	330	940	36	100	10,000	190	2/8	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	21	330	130	310	110	330	1,000	39	110	12,000	200	2/8	0	*	*	*
	BENZO(E)PYRENE	UG/KG	21	330	140	310	130	330	1,100	41	120	14,000	220	1/8	0	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-3-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Aquatic

Analysis	Analyte	Unit	Concentration											Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	BENZO(G,H,I)PERYLENE	UG/KG	21	330	130	310	140	170	1,100	38	110	12,000	210	2/8	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	21	330	110	310	99	330	900	36	100	11,000	180	2/8	0	*	*	*
	BENZOIC ACID	UG/KG	50	530	230	480	180	530	1,800	63	180	32,000	350	3/8	*	*	*	*
	BENZYL ALCOHOL	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	21	2,500	410	2,500	110	2,500	3,300	300	850	720,000	980	1/8	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	CARBAZOLE	UG/KG	21	330	110	310	74	330	860	38	110	12,000	180	1/8	*	*	*	*
	CHRYSENE	UG/KG	21	330	120	310	99	330	960	39	110	12,000	190	3/8	0	0	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	0	0	0	*
	DIBENZOFURAN	UG/KG	7	330	110	320	110	330	920	37	110	11,000	180	1/8	*	*	*	*
	DIBENZOTHIOPHENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	FLUORANTHENE	UG/KG	21	330	120	310	110	330	980	38	110	12,000	200	4/8	0	0	0	*
	FLUORENE	UG/KG	6	330	110	320	110	330	910	37	110	11,000	180	1/8	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	HEXACHLOROETHANE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	250	4,000	1,400	3,700	1,500	4,000	12,000	430	1,200	1,500,000	2,300	4/8	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	21	330	120	310	130	140	970	36	100	11,000	190	1/8	0	*	*	*
	ISOPHORONE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	210	3,300	1,100	3,100	970	3,300	8,900	360	1,000	1,100,000	1,800	4/8	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	NAPHTHALENE	UG/KG	14	330	120	320	110	330	920	37	100	11,000	190	1/8	0	0	0	*
	NITROBENZENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	PERYLENE	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	0	*	*	*
	PHENANTHRENE	UG/KG	21	330	81	310	40	330	650	37	100	11,000	150	3/8	0	0	0	*
	PHENOL	UG/KG	21	330	120	310	110	330	930	36	100	11,000	190	0/8	*	*	*	*
	PYRENE	UG/KG	21	330	120	310	110	330	950	37	110	11,000	190	3/8	0	0	0	*
	TOTAL PAHs	UG/KG	450	7,300	2,700	6,800	2,800	7,300	22,000	790	2,200	5,000,000	4,200	5/8	0	0	0	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-3-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	2,4,5-TRICHLOROPHENOL	UG/KG	500	2,300	1,200	1,800	980	2,000	10,000	260	730	540,000	1,700	0/8	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	200	950	500	750	390	800	4,000	110	300	90,000	700	0/8	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	200	950	500	750	390	800	4,000	110	300	90,000	700	0/8	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	200	950	500	750	390	800	4,000	110	300	90,000	700	0/8	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	500	2,300	1,200	1,800	980	2,000	10,000	260	730	540,000	1,700	0/8	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	2-CHLOROPHENOL	UG/KG	200	950	500	750	390	800	4,000	110	300	90,000	700	0/8	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	2-METHYLPHENOL	UG/KG	200	950	500	750	390	800	4,000	110	300	90,000	700	0/8	*	*	*	*
	2-NITROANILINE	UG/KG	500	2,000	1,100	1,500	900	2,000	7,700	240	650	420,000	1,600	0/7	*	*	*	*
	2-NITROPHENOL	UG/KG	200	950	500	750	390	800	4,000	110	300	90,000	700	0/8	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	3-NITROANILINE	UG/KG	500	2,000	1,100	1,500	900	2,000	7,700	240	650	420,000	1,600	0/7	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	500	2,300	1,200	1,800	980	2,000	10,000	260	730	540,000	1,700	0/8	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	200	950	500	750	390	800	4,000	110	300	90,000	700	0/8	*	*	*	*
	4-CHLOROANILINE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	4-METHYLPHENOL	UG/KG	200	950	500	750	390	800	4,000	110	300	90,000	700	0/8	*	*	*	*
	4-NITROANILINE	UG/KG	500	2,000	1,100	1,500	900	2,000	7,700	240	650	420,000	1,600	0/7	*	*	*	*
	4-NITROPHENOL	UG/KG	500	2,300	1,200	1,800	980	2,000	10,000	260	730	540,000	1,700	0/8	*	*	*	*
	ACENAPHTHENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	ACENAPHTHYLENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	ANTHRACENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	BENZO(A)PYRENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	*	*	*
	BENZO(B)FLUORANTHENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	CARBAZOLE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	CHRYSENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	DI-N-BUTYLPHTHALATE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	DIBENZOFURAN	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-3-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Aquatic

			Concentration										Detection Frequency			
Analysis	Analyte	Unit	Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	DIETHYLPHTHALATE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	FLUORANTHENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	FLUORENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	HEXACHLOROETHANE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	2,000	8,000	4,400	6,000	3,600	8,000	31,000	970	2,600	6,700,000	6,300	0/7	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	*	*	*
	ISOPHORONE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	1,400	5,600	3,100	4,200	2,500	5,600	22,000	680	1,800	3,300,000	4,400	0/7	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	NAPHTHALENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	NITROBENZENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	500	2,300	1,200	1,800	980	2,000	10,000	260	730	540,000	1,700	0/8	*	*	*	*
	PHENANTHRENE	UG/KG	200	800	440	600	360	800	3,100	97	260	67,000	630	0/7	0	0	0	*
	PHENOL	UG/KG	160	950	520	790	460	800	4,100	110	300	90,000	720	3/8	*	*	*	*
	PYRENE	UG/KG	200	800	440	600	360	800	3,100	97	260	66,000	630	0/7	0	0	0	*
	TOTAL PAHs	UG/KG	3,400	14,000	7,500	10,000	6,100	14,000	52,000	1,700	4,400	19,000,000	11,000	0/7	0	0	0	*
TOTAL METALS	ALUMINUM	MG/KG	4,810	37,500	14,400	32,700	12,100	37,500	230,000	2,070	8,270	68,400,000	18,000	16/16	*	*	*	-
	ANTIMONY	MG/KG	0.60	1.2	0.90	0.55	0.95	1.2	2.7	0.16	0.28	0.078	1.4	0/3	*	0	0	0
	ARSENIC	MG/KG	2.0	26.6	9.4	24.5	7.4	6.2	150	1.6	6.4	40.4	12.1	14/16	3	7	0	0
	BARIUM	MG/KG	27.7	234	110	206	103	48.3	1,770	16.7	66.7	4,450	140	16/16	*	*	*	0
	BERYLLIUM	MG/KG	0.015	0.13	0.040	0.11	0.035	0.035	0.65	0.0068	0.027	0.00073	0.052	0/16	*	*	*	0
	CADMIUM	MG/KG	0.025	1.1	0.22	1.1	0.078	0.025	3.5	0.080	0.32	0.10	0.36	4/16	3	0	0	0
	CALCIUM	MG/KG	3,390	14,600	6,610	11,200	5,060	14,600	106,000	823	3,290	10,800,000	8,050	16/16	*	*	*	*
	CHROMIUM	MG/KG	19.8	106	44.2	86.2	33.8	25.2	707	6.4	25.7	659	55.4	16/16	0	2	0	2
	COBALT	MG/KG	3.6	18.1	9.6	14.5	8.8	11.5	153	0.86	3.4	11.9	11.1	16/16	*	*	*	0
	COPPER	MG/KG	13.1	86.0	39.4	72.9	30.8	86.0	630	5.3	21.1	445	48.6	16/16	1	7	0	1
	IRON	MG/KG	5,860	47,100	19,300	41,200	18,300	47,100	308,000	2,330	9,310	86,700,000	23,300	16/16	*	*	*	*
	LEAD	MG/KG	3.5	515	88.3	512	20.6	7.5	1,410	32.9	131	17,300	146	16/16	7	7	1	5
	MAGNESIUM	MG/KG	5,560	15,400	9,470	9,840	8,940	15,400	151,000	711	2,850	8,100,000	10,700	16/16	*	*	*	*
	MANGANESE	MG/KG	60.7	706	251	645	186	186	4,020	38.8	155	24,100	320	16/16	*	*	*	0
	MERCURY	MG/KG	0.055	0.49	0.18	0.44	0.12	0.070	2.9	0.035	0.14	0.020	0.24	12/16	1	6	0	4
	MOLYBDENUM	MG/KG	0.11	3.9	1.1	3.8	0.41	0.13	18.0	0.36	1.5	2.1	1.8	4/16	*	*	*	0
	NICKEL	MG/KG	21.0	90.9	53.1	69.9	53.4	90.9	850	4.6	18.4	339	61.2	16/16	0	16	9	0
	POTASSIUM	MG/KG	2,090	6,510	3,320	4,420	3,010	6,510	53,200	292	1,170	1,370,000	3,840	16/16	*	*	*	*
	SELENIUM	MG/KG	0.41	2.0	0.83	1.5	0.65	0.60	13.3	0.12	0.49	0.24	1.0	0/16	0	0	0	*
	SILVER	MG/KG	0.070	0.50	0.20	0.43	0.16	0.075	3.1	0.032	0.13	0.016	0.25	4/16	0	0	0	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-3-B

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Froid & Taylor Aquatic

Analysis	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL METALS	SODIUM	MG/KG	1,270	60,400	14,500	59,100	7,840	60,400	232,000	4,340	17,400	302,000,000	22,100	16/16	*	*	*	*
	THALLIUM	MG/KG	0.24	2.0	0.55	1.8	0.38	0.25	8.9	0.12	0.47	0.22	0.26	1/16	*	*	*	0
	VANADIUM	MG/KG	32.6	136	61.4	103	53.8	136	983	7.2	28.7	823	74.0	16/16	*	*	*	2
	ZINC	MG/KG	39.1	436	125	397	103	436	2,000	24.5	98.1	9,630	168	16/16	4	5	1	1
TPH EXTRACTABLES	DIESEL RANGE ORGANICS	MG/KG	6	500	67	490	12	7	1,100	36	140	21,000	110	0/16	*	*	*	*
	MOTOR OIL RANGE ORGANICS	MG/KG	7	23,000	2,000	23,000	69	7	33,000	1,500	5,900	35,000,000	4,600	13/16	*	*	*	*
VOLATILES	1,1,1-TRICHLOROETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	1,1,2,2-TETRACHLOROETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	1,1,2-TRICHLOROETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	1,1-DICHLOROETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	1,1-DICHLOROETHENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	1,2-DICHLOROETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	1,2-DICHLOROETHENE (TOTAL)	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	1,2-DICHLOROPROPANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	2-BUTANONE	UG/KG	6	80	32	74	12	6	260	12	33	1,100	54	0/8	*	*	*	*
	2-HEXANONE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	4-METHYL-2-PENTANONE	UG/KG	6	70	21	64	12	6	170	8	21	460	35	1/8	*	*	*	*
	ACETONE	UG/KG	7	440	110	430	13	440	850	55	150	24,000	210	0/8	*	*	*	*
	BENZENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	BROMODICHLOROMETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	BROMOFORM	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	BROMOMETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	CARBON DISULFIDE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	CARBON TETRACHLORIDE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	CHLOROBENZENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	CHLOROETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	CHLOROFORM	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	CHLOROMETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	CIS-1,3-DICHLOROPROPENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	DIBROMOCHLOROMETHANE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	ETHYLBENZENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	METHYLENE CHLORIDE	UG/KG	6	70	23	64	12	6	180	8	23	530	38	0/8	*	*	*	*
	STYRENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	TETRACHLOROETHENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	TOLUENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	TRANS-1,3-DICHLOROPROPENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	TRICHLOROETHENE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	VINYL CHLORIDE	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*
	XYLENE (TOTAL)	UG/KG	6	70	20	64	12	24	160	8	21	450	35	0/8	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERL) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-3-C

Statistical Summary of Surface Water Results

Froid & Taylor Roads (Site 9)

Analysis	Analyte	Units	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/L	19	500	140	480	75	500	830	74	180	33,000	290	6/6	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	1,3-DINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	2,4,6-TRINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	2,4-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	2,6-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	2-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	3-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	4-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	HMX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	NITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	RDX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
	TETRYL	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.4	0.003	0.008	0.00006	0.07	0/6	*
PESTICIDES AND PCBs	4,4'-DDD	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	*
	4,4'-DDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	*
	4,4'-DDT	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	0
	ALDRIN	UG/L	0.03	0.03	0.03	0.005	0.03	0.03	0.2	0.0006	0.002	0	0.03	0/9	0
	ALPHA-BHC	UG/L	0.03	0.03	0.03	0.005	0.03	0.03	0.2	0.0006	0.002	0	0.03	0/9	*
	ALPHA-CHLORDANE	UG/L	0.03	0.03	0.03	0.005	0.03	0.03	0.2	0.0006	0.002	0	0.03	0/9	*
	AROCLOR-1016	UG/L	0.3	0.3	0.3	0.05	0.3	0.3	2	0.006	0.02	0.0003	0.3	0/9	0
	AROCLOR-1221	UG/L	0.3	0.5	0.3	0.3	0.3	0.3	3	0.04	0.1	0.02	0.4	0/9	0
	AROCLOR-1232	UG/L	0.3	0.3	0.3	0.05	0.3	0.3	2	0.006	0.02	0.0003	0.3	0/9	0
	AROCLOR-1242	UG/L	0.3	0.3	0.3	0.05	0.3	0.3	2	0.006	0.02	0.0003	0.3	0/9	0
	AROCLOR-1248	UG/L	0.3	0.3	0.3	0.05	0.3	0.3	2	0.006	0.02	0.0003	0.3	0/9	0
	AROCLOR-1254	UG/L	0.3	0.3	0.3	0.05	0.3	0.3	2	0.006	0.02	0.0003	0.3	0/9	0
	AROCLOR-1260	UG/L	0.3	0.3	0.3	0.05	0.3	0.3	2	0.006	0.02	0.0003	0.3	0/9	0
	BETA-BHC	UG/L	0.03	0.03	0.03	0.005	0.03	0.03	0.2	0.0006	0.002	0	0.03	0/9	*
	DELTA-BHC	UG/L	0.03	0.03	0.03	0.005	0.03	0.03	0.2	0.0006	0.002	0	0.03	0/9	*
	DIELDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	0
	ENDOSULFAN I	UG/L	0.03	0.03	0.03	0.005	0.03	0.03	0.2	0.0006	0.002	0	0.03	0/9	0
	ENDOSULFAN II	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	0
	ENDOSULFAN SULFATE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	*
	ENDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	0
	ENDRIN ALDEHYDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	*
	ENDRIN KETONE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.5	0	0	0	0.05	0/9	*
	GAMMA-BHC (LINDANE)	UG/L	0.03	0.03	0.03	0.005	0.03	0.03	0.2	0.0006	0.002	0	0.03	0/9	0
	GAMMA-CHLORDANE	UG/L	0.03	0.03	0.03	0.005	0.03	0.03	0.2	0.0006	0.002	0	0.03	0/9	*
	HEPTACHLOR	UG/L	0.005	0.03	0.02	0.02	0.03	0.03	0.2	0.003	0.01	0.0001	0.02	0/9	0
	HEPTACHLOR EPOXIDE	UG/L	0.005	0.005	0.005	0	0.005	0.005	0.05	0	0	0	0.005	0/9	0
	METHOXYCHLOR	UG/L	0.3	0.3	0.3	0.05	0.3	0.3	2	0.006	0.02	0.0003	0.3	0/9	0
	TOTAL DDTs	UG/L	0.2	0.2	0.2	0	0.2	0.2	1	0	0	0	0.2	0/9	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-3-C

Statistical Summary of Surface Water Results

Froid & Taylor Roads (Site 9)

Analyte-s	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
PESTICIDES AND PCBs	TOTAL PCBs	UG/L	2	2	2	0.6	2	2	17	0.07	0.2	0.04	2	6/9	*
	TOXAPHENE	UG/L	2	2	2	0	2	2	14	0	0	0	2	0/9	*
TOTAL SUSPENDED SOLIDS	TOTAL SUSPENDED SOLIDS	MG/L	5	5,500	990	5,500	40	5,500	5,900	910	2,200	4,900,000	2,800	5/5	*
SULFIDE	SULFIDE	MG/L	0.9	0.9	0.9	0	0.9	0.9	0.9	0	0	0	2,800	1/1	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	1,2-DICHLOROBENZENE	UG/L	3	13	4	10	3	3	33	1	3	11	6	0/9	*
	1,3-DICHLOROBENZENE	UG/L	3	13	4	10	3	3	33	1	3	11	6	0/9	*
	1,4-DICHLOROBENZENE	UG/L	3	13	4	10	3	3	33	1	3	11	6	0/9	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2,4,5-TRICHLOROPHENOL	UG/L	13	60	18	48	13	13	160	5	16	250	28	0/9	*
	2,4,6-TRICHLOROPHENOL	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2,4-DICHLOROPHENOL	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2,4-DIMETHYLPHENOL	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2,4-DINITROPHENOL	UG/L	13	60	18	48	13	13	160	5	16	250	28	0/9	*
	2,4-DINITROTOLUENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2,6-DINITROTOLUENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2-CHLORONAPHTHALENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2-CHLOROPHENOL	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2-METHYLNAPHTHALENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2-METHYLPHENOL	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	2-NITROANILINE	UG/L	13	60	18	48	13	13	160	5	16	250	28	0/9	*
	2-NITROPHENOL	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	3,3'-DICHLOROBENZIDINE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	3-NITROANILINE	UG/L	13	60	18	48	13	13	160	5	16	250	28	0/9	*
	4,6-DINITRO-2-METHYLPHENOL	UG/L	13	60	18	48	13	13	160	5	16	250	28	0/9	*
	4-BROMOPHENYL-PHENYLETHER	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	4-CHLORO-3-METHYLPHENOL	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	4-CHLOROANILINE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	4-CHLOROPHENYL-PHENYLETHER	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	4-METHYLPHENOL	UG/L	3	25	7	22	5	5	64	2	7	46	11	1/9	*
	4-NITROANILINE	UG/L	13	60	18	48	13	13	160	5	16	250	28	0/9	*
	4-NITROPHENOL	UG/L	13	60	18	48	13	13	160	5	16	250	28	0/9	*
	ACENAPHTHENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	ACENAPHTHYLENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	ANTHRACENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	BENZO(A)ANTHRACENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	BENZO(A)PYRENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	BENZO(B)FLUORANTHENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	BENZO(G,H,I)PERYLENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	BENZO(K)FLUORANTHENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-3-C

Statistical Summary of Surface Water Results

Froid & Taylor Roads (Site 9)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
SEMIVOLATILES	BIS(2-CHLOROETHOXY)METHANE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	BIS(2-CHLOROETHYL) ETHER	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	BIS(2-ETHYLHEXYL) PHTHALATE	UG/L	2	10	3	8	2	2	26	0.9	3	7	5	0/9	*
	BUTYLBENZYLPHTHALATE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	CARBAZOLE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	CHRYSENE	UG/L	0.6	25	7	24	5	5	61	2	7	49	11	1/9	*
	DI-N-BUTYLPHTHALATE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	DI-N-OCTYLPHTHALATE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	DIBENZ(A,E)ANTHRACENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	DIBENZOFURAN	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	DIETHYLPHTHALATE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	DIMETHYLPHTHALATE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	FLUORANTHENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	FLUORENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	HEXACHLOROBENZENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	HEXACHLOROBUTADIENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	HEXACHLOROCYCLOPENTADIENE	UG/L	5	25	8	20	5	5	50	3	8	67	15	0/6	*
	HEXACHLOROETHANE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	HIGH MOLECULAR PAHs	UG/L	50	250	72	200	50	50	650	22	67	4,400	110	1/9	*
	INDENO(1,2,3-CD)PYRENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	ISOPHORONE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	LOW MOLECULAR PAHs	UG/L	35	180	51	140	35	35	460	16	47	2,200	80	0/9	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	N-NITROSODIPHENYLAMINE (1)	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	NAPHTHALENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	NITROBENZENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	PENTACHLOROPHENOL	UG/L	13	60	18	48	13	13	160	5	16	250	26	0/9	0
	PHENANTHRENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	PHENOL	UG/L	0.9	25	7	24	5	5	61	2	7	48	11	1/9	*
	PYRENE	UG/L	5	25	7	20	5	5	66	2	7	44	11	0/9	*
	TOTAL PAHs	UG/L	85	430	130	340	85	85	1,100	37	110	13,000	200	1/9	1
TOTAL METALS	ALUMINUM	UG/L	19.9	1,610	382	1,590	304	1,610	3,440	164	491	241,000	686	6/9	6
	ANTIMONY	UG/L	0.50	9.9	2.0	9.4	1.0	0.80	17.8	1.0	3.0	9.0	3.8	2/9	*
	ARSENIC	UG/L	2.2	275	42.0	273	12.4	275	378	29.3	87.8	7,710	96.4	9/9	1
	BARIUM	UG/L	106	809	261	703	220	220	2,350	70.9	213	45,200	392	9/9	*
	BERYLLIUM	UG/L	0.010	0.10	0.042	0.090	0.050	0.050	0.38	0.0097	0.029	0.00084	0.060	0/9	*
	CADMIUM	UG/L	0.040	1.1	0.20	1.1	0.10	0.10	1.8	0.11	0.34	0.12	0.41	1/9	1
	CALCIUM	UG/L	68,800	1,950,000	376,000	1,880,000	185,000	1,950,000	3,390,000	198,000	594,000	.35300E+12	745,000	9/9	*
	CHROMIUM	UG/L	0.20	6.9	1.7	6.7	1.3	6.9	15.3	0.67	2.0	4.0	2.9	2/9	0
	COBALT	UG/L	0.32	5.1	2.3	4.8	1.8	5.1	21.0	0.55	1.6	2.7	3.4	7/9	*
	COPPER	UG/L	1.8	13.4	7.4	11.7	7.8	13.4	66.3	1.5	4.5	20.1	10.1	8/9	7

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-3-C

Statistical Summary of Surface Water Results

Froid & Taylor Roads (Site 9)

Analyte	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL METALS	IRON	UG/L	186	8,480	2,600	8,290	2,350	8,480	23,400	830	2,490	6,200,000	4,140	9/9	*
	LEAD	UG/L	0.18	4.0	1.1	3.8	0.40	0.18	10.1	0.47	1.4	2.0	2.0	1/9	1
	MAGNESIUM	UG/L	55,700	5,280,000	830,000	5,220,000	249,000	5,280,000	7,470,000	559,000	1,680,000	.28100E+13	1,870,000	9/9	*
	MANGANESE	UG/L	207	4,480	1,110	4,270	585	4,480	10,000	448	1,340	1,810,000	1,950	9/9	*
	MERCURY	UG/L	0.050	0.17	0.084	0.12	0.050	0.050	0.76	0.015	0.045	0.0020	0.11	2/9	2
	MOLYBDENUM	UG/L	0.92	4.6	1.8	3.7	1.7	1.7	16.2	0.38	1.1	1.3	2.5	6/9	*
	NICKEL	UG/L	3.8	44.7	12.8	40.9	9.1	44.7	115	4.1	12.3	152	20.4	6/9	4
	POTASSIUM	UG/L	14,800	552,000	110,000	537,000	60,800	552,000	994,000	55,800	167,000	28,000,000,000	214,000	9/9	*
	SELENIUM	UG/L	1.0	2.4	1.7	1.4	1.8	1.8	15.2	0.16	0.49	0.24	2.0	4/9	0
	SILVER	UG/L	0.13	0.65	0.33	0.52	0.30	0.30	2.9	0.047	0.14	0.020	0.41	2/9	2
	SODIUM	UG/L	485,000	28,300,000	4,840,000	27,800,000	1,730,000	28,300,000	43,600,000	2,960,000	8,870,000	.78700E+14	10,300,000	9/9	*
	THALLIUM	UG/L	0.65	8.4	1.9	7.8	1.0	1.0	17.4	0.82	2.5	6.1	3.5	1/9	*
	VANADIUM	UG/L	0.80	29.8	8.9	29.0	6.4	29.8	80.3	3.0	9.1	82.1	14.5	7/9	*
	ZINC	UG/L	4.2	95.2	21.9	91.0	8.4	95.2	197	9.7	29.0	842	39.9	2/9	1
TPH EXTRACTABLES	DIESEL RANGE ORGANICS	MG/L	0.05	2	0.5	2	0.2	2	3	0.3	0.8	0.6	1	5/6	*
	MOTOR OIL RANGE ORGANICS	MG/L	0.1	2	0.7	2	0.6	2	4	0.3	0.8	0.6	1	6/6	*
VOLATILES	1,1,1-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	1,1,2,2-TETRACHLOROETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	1,1,2-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	1,1-DICHLOROETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	1,1-DICHLOROETHENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	1,2-DICHLOROETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	1,2-DICHLOROETHENE (TOTAL)	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	1,2-DICHLOROPROPANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	2-BUTANONE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	2-HEXANONE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	4-METHYL-2-PENTANONE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	ACETONE	UG/L	5	32	9	27	5	5	57	4	11	120	18	0/6	*
	BENZENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	BROMODICHLOROMETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	BROMOFORM	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	BROMOMETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	CARBON DISULFIDE	UG/L	5	20	8	15	5	5	45	3	6	38	13	1/6	*
	CARBON TETRACHLORIDE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	CHLOROBENZENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	CHLOROETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	CHLOROFORM	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	CHLOROMETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	CIS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	DIBROMOCHLOROMETHANE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	ETHYLBENZENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-3-C

Statistical Summary of Surface Water Results

Froid & Taylor Roads (Site 9)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=Qtr Guidance Values
VOLATILES	METHYLENE CHLORIDE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	STYRENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	TETRACHLOROETHENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	TOLUENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	TRANS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	TRICHLOROETHENE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	VINYL CHLORIDE	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*
	XYLENE (TOTAL)	UG/L	5	5	5	0	5	5	30	0	0	0	5	0/6	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-4-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Wood Hogger Terrestrial

Analysis	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/KG	50	460,000	64,000	450,000	7,800	50	5,900,000	11,000	110,000	12,000,000,000	83,000	62/92	*	*	*	*
AROMATIC VOLATILES	BENZENE	UG/KG	28	28	28	0	28	28	28	0	0	0	83,000	0/1	*	*	*	*
	ETHYLBENZENE	UG/KG	160	160	160	0	160	160	160	0	0	0	83,000	1/1	*	*	*	*
	TOLUENE	UG/KG	28	28	28	0	28	28	28	0	0	0	83,000	0/1	*	*	*	*
	XYLENE (TOTAL)	UG/KG	220	220	220	0	220	220	220	0	0	0	83,000	1/1	*	*	*	*
HEXAVALENT CHROMIUM	HEXAVALENT CHROMIUM	UG/KG	25.0	60.0	42.5	35.0	42.5	60.0	85.0	17.5	24.7	613	153	1/2	*	*	*	*
DIOXIN	1,2,3,4,6,7,8,9-OCDD	UG/KG	0.4	140	29	140	4	140	260	17	52	2,700	52	7/9	*	*	*	*
	1,2,3,4,6,7,8,9-OCDF	UG/KG	0.04	13	2	13	0.5	0.5	21	1	4	19	5	2/9	*	*	*	*
	1,2,3,4,6,7,8-HPCDD	UG/KG	0.03	16	3	16	0.5	0.5	28	2	5	29	6	3/9	*	*	*	*
	1,2,3,4,6,7,8-HPCDF	UG/KG	0.04	3	0.7	3	0.2	0.2	6	0.4	1	1	1	3/9	*	*	*	*
	1,2,3,4,7,8,9-HPCDF	UG/KG	0.02	1	0.3	1	0.3	0.3	3	0.1	0.3	0.09	0.6	0/9	*	*	*	*
	1,2,3,4,7,8-HXCDD	UG/KG	0.02	1	0.4	1	0.4	0.5	4	0.1	0.3	0.08	0.6	0/9	*	*	*	*
	1,2,3,4,7,8-HXCDF	UG/KG	0.01	0.4	0.2	0.3	0.2	0.2	1	0.04	0.1	0.01	0.2	0/9	*	*	*	*
	1,2,3,6,7,8-HXCDD	UG/KG	0.02	1	0.4	1	0.4	0.5	4	0.1	0.3	0.08	0.6	0/9	*	*	*	*
	1,2,3,6,7,8-HXCDF	UG/KG	0.01	0.3	0.1	0.3	0.2	0.2	1	0.03	0.1	0.01	0.2	0/9	*	*	*	*
	1,2,3,7,8,9-HXCDD	UG/KG	0.02	1	0.4	1	0.4	0.5	4	0.1	0.3	0.08	0.6	0/9	*	*	*	*
	1,2,3,7,8,9-HXCDF	UG/KG	0.01	0.4	0.2	0.4	0.2	0.2	2	0.04	0.1	0.02	0.3	0/9	*	*	*	*
	1,2,3,7,8-PECDD	UG/KG	0.03	0.5	0.2	0.5	0.3	0.3	2	0.05	0.2	0.03	0.3	0/9	*	*	*	*
	1,2,3,7,8-PECDF	UG/KG	0.02	0.2	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/9	*	*	*	*
	2,3,4,6,7,8-HXCDF	UG/KG	0.01	0.4	0.2	0.3	0.2	0.2	1	0.04	0.1	0.01	0.2	0/9	*	*	*	*
	2,3,4,7,8-PECDF	UG/KG	0.02	0.2	0.1	0.2	0.1	0.1	1	0.02	0.05	0.004	0.2	0/9	*	*	*	*
	2,3,7,8-TCDD	UG/KG	0.008	0.4	0.1	0.3	0.2	0.2	1	0.04	0.1	0.01	0.2	0/9	*	*	*	*
	2,3,7,8-TCDF	UG/KG	0.03	0.2	0.08	0.1	0.05	0.05	0.7	0.02	0.05	0.002	0.1	0/9	*	*	*	*
	TOTAL HPCDD	UG/KG	0.06	41	11	41	1	0.5	100	5	16	240	21	5/9	*	*	*	*
	TOTAL HPCDF	UG/KG	0.04	13	2	13	0.3	13	21	1	4	20	5	4/9	*	*	*	*
	TOTAL HXCDD	UG/KG	0.03	1	0.4	1	0.4	0.5	4	0.1	0.3	0.08	0.6	0/9	*	*	*	*
	TOTAL HXCDF	UG/KG	0.03	4	0.6	4	0.2	0.2	6	0.4	1	2	1	2/9	*	*	*	*
	TOTAL PECDD	UG/KG	0.03	0.5	0.2	0.5	0.3	0.3	2	0.05	0.2	0.03	0.3	0/9	*	*	*	*
	TOTAL PECDF	UG/KG	0.02	0.2	0.1	0.2	0.1	0.1	1	0.02	0.06	0.004	0.2	0/9	*	*	*	*
	TOTAL TCDD	UG/KG	0.008	6	3	6	4	4	29	0.7	2	5	5	7/9	*	*	*	*
	TOTAL TCDF	UG/KG	0.03	0.2	0.08	0.1	0.05	0.05	0.7	0.02	0.05	0.002	0.1	0/9	*	*	*	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	1,3-DINITROBENZENE	UG/KG	60	130	62	70	60	60	2,400	2	11	130	65	1/38	*	*	*	*
	2,4,6-TRINITROTOLUENE	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	2-NITROTOLUENE	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	3-NITROTOLUENE	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	4-NITROTOLUENE	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	HMX	UG/KG	60	360	68	300	60	60	2,600	8	48	2,300	81	1/38	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-4-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Wood Hogger Terrestrial

Analysis	Analyte	Unit	Concentration											Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
EXPLOSIVES	NITROBENZENE	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	RDX	UG/KG	60	62	60	2	60	60	2,300	0.05	0.3	0.1	60	0/38	*	*	*	*
	TETRYL	UG/KG	60	60	60	0	60	60	1,500	0	0	0	60	0/25	*	*	*	*
LOW LEVEL PESTICIDES AND PCBs	2,4'-DDD	UG/KG	0.05	8	1	8	0.5	0.06	50	0.3	2	4	2	21/37	*	*	*	*
	2,4'-DDE	UG/KG	0.05	4	0.6	3	0.1	0.05	21	0.2	0.9	0.9	0.8	6/37	*	*	*	*
	2,4'-DDT	UG/KG	0.05	34	2	34	0.3	0.1	75	1	6	36	4	16/37	*	*	*	*
	4,4'-DDD	UG/KG	0.05	280	12	280	1	0.06	460	8	46	2,100	25	27/37	*	13	3	*
	4,4'-DDE	UG/KG	0.05	32	4	32	0.9	1	140	1	8	56	6	31/37	*	10	2	*
	4,4'-DDT	UG/KG	0.05	230	15	230	0.6	14	550	7	43	1,800	27	29/37	*	15	8	*
	ALDRIN	UG/KG	0.05	4	0.5	3	0.2	0.07	18	0.1	0.8	0.7	0.7	5/37	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	0.05	78	6	78	0.9	17	240	3	15	240	11	32/37	*	*	*	*
	DIELDRIN	UG/KG	0.05	6	0.9	6	0.4	0.05	33	0.2	1	2	1	14/37	0	14	0	*
	GAMMA-BHC (LINDANE)	UG/KG	0.05	4	0.5	3	0.1	0.05	19	0.1	0.9	0.8	0.8	3/37	*	*	*	*
	HEPTACHLOR	UG/KG	0.05	4	0.5	3	0.1	0.05	17	0.1	0.8	0.7	0.7	1/37	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.05	6	0.6	6	0.1	0.05	23	0.2	1	2	1	4/37	*	*	*	*
	HEXACHLOROBENZENE	UG/KG	0.05	4	0.5	3	0.1	0.07	17	0.1	0.8	0.7	0.7	4/37	0	*	*	*
	MIREX	UG/KG	0.05	5	0.6	5	0.2	0.07	23	0.2	1	1	0.9	10/37	*	*	*	*
	PCB-101 (2,2',3,5,5')	UG/KG	0.05	7	1	7	0.4	3	38	0.3	2	2	1	22/37	*	*	*	*
	PCB-105 (2,3,3',4,4')	UG/KG	0.05	4	0.7	3	0.4	0.1	26	0.2	1	0.9	1	18/37	*	*	*	*
	PCB-118 (2,3',4,4',5)	UG/KG	0.05	5	0.9	5	0.3	0.1	35	0.2	1	2	1	17/37	*	*	*	*
	PCB-126 (3,3',4,4',5)	UG/KG	0.05	4	0.5	3	0.1	0.1	17	0.1	0.8	0.7	0.7	4/37	*	*	*	*
	PCB-128 (2,2',3,3',4,4')	UG/KG	0.05	4	0.5	3	0.1	0.05	19	0.2	0.9	0.9	0.8	5/37	*	*	*	*
	PCB-138 (2,2',3,4,4',5')	UG/KG	0.05	12	2	12	0.5	0.5	65	0.5	3	9	3	23/37	*	*	*	*
	PCB-153 (2,2',4,4',5,5')	UG/KG	0.05	10	1	10	0.4	0.05	52	0.4	2	6	2	17/37	*	*	*	*
	PCB-170 (2,2',3,3',4,4',5)	UG/KG	0.05	7	0.7	7	0.2	1	26	0.2	1	2	1	9/37	*	*	*	*
	PCB-18 (2,2',5)	UG/KG	0.05	4	0.5	3	0.1	0.06	18	0.1	0.8	0.7	0.7	5/37	*	*	*	*
	PCB-180 (2,2',3,4,4',5,5')	UG/KG	0.05	15	1	15	0.3	4	55	0.5	3	8	2	19/37	*	*	*	*
	PCB-187 (2,2',3,4',5,5',5)	UG/KG	0.05	7	0.8	7	0.2	0.05	30	0.2	1	2	1	15/37	*	*	*	*
	PCB-195 (2,2',3,3',4,4',5,6)	UG/KG	0.05	4	0.5	3	0.1	0.1	19	0.1	0.9	0.7	0.8	4/37	*	*	*	*
	PCB-206 (2,2,',3,3',4,4',5,5',	UG/KG	0.05	4	0.5	3	0.2	0.05	20	0.1	0.8	0.7	0.8	11/37	*	*	*	*
	PCB-209 (2,2',3,3',4,4',5,5',6	UG/KG	0.05	4	0.5	3	0.1	0.05	17	0.1	0.8	0.7	0.7	3/37	*	*	*	*
	PCB-28 (2,4,4')	UG/KG	0.05	4	0.5	3	0.1	0.05	19	0.1	0.9	0.8	0.8	4/37	*	*	*	*
	PCB-44 (2,2',3,5')	UG/KG	0.05	4	0.6	3	0.2	1	21	0.1	0.8	0.7	0.8	8/37	*	*	*	*
	PCB-52 (2,2',5,5')	UG/KG	0.05	4	0.6	3	0.2	1	22	0.1	0.9	0.7	0.8	14/37	*	*	*	*
	PCB-66 (2,3',4,4')	UG/KG	0.05	4	0.5	3	0.2	1	19	0.1	0.8	0.7	0.7	5/37	*	*	*	*
	PCB-77 (3,3',4,4')	UG/KG	0.05	4	0.5	3	0.1	0.05	18	0.1	0.8	0.7	0.7	2/37	*	*	*	*
	PCB-8 (2,4')	UG/KG	0.05	6	0.6	6	0.1	0.06	23	0.2	1	1	1	3/37	*	*	*	*
	TOTAL DDTs	UG/KG	0.3	330	35	330	4	3	1,300	13	78	6,100	57	34/37	0	25	6	*
	TOTAL PCBs	UG/KG	1	74	15	73	4	2	560	4	22	470	21	30/37	0	7	0	*
	TRANS-NONACHLOR	UG/KG	0.05	65	6	65	0.6	16	200	2	13	160	9	30/37	*	*	*	*
PESTICIDES AND PCBs	4,4'-DDD	UG/KG	2	20	4	18	2	2	250	0.5	4	16	5	4/55	*	4	0	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-4-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Wood Hogger Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	<=Ambient
PESTICIDES AND PCBs	4,4'-DDE	UG/KG	2	20	4	19	2	2	230	0.5	4	16	5	1/55	*	0	0	*
	4,4'-DDT	UG/KG	2	20	4	18	2	2	240	0.6	4	17	5	3/55	*	3	1	*
	ALDRIN	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	ALPHA-BHC	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	1/55	*	*	*	*
	AROCLOR-1016	UG/KG	18	200	42	180	22	20	2,300	5	40	1,600	51	0/55	*	*	*	*
	AROCLOR-1221	UG/KG	36	400	85	360	43	40	4,700	11	79	6,300	100	0/55	*	*	*	*
	AROCLOR-1232	UG/KG	18	200	42	180	22	20	2,300	5	40	1,600	51	0/55	*	*	*	*
	AROCLOR-1242	UG/KG	18	200	42	180	22	20	2,300	5	40	1,600	51	0/55	*	*	*	*
	AROCLOR-1248	UG/KG	18	200	42	180	22	20	2,300	5	40	1,600	51	0/55	*	*	*	*
	AROCLOR-1254	UG/KG	18	200	42	180	22	20	2,300	5	40	1,600	51	0/55	*	*	*	*
	AROCLOR-1260	UG/KG	18	200	42	180	22	20	2,300	5	40	1,600	51	0/55	*	*	*	*
	BETA-BHC	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	DELTA-BHC	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	DIELDRIN	UG/KG	2	20	4	18	2	2	230	0.5	4	16	5	0/55	0	0	0	*
	ENDOSULFAN I	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	ENDOSULFAN II	UG/KG	2	20	4	18	2	2	230	0.5	4	16	5	0/55	*	*	*	*
	ENDOSULFAN SULFATE	UG/KG	2	20	4	18	2	2	230	0.5	4	16	5	0/55	*	*	*	*
	ENDRIN	UG/KG	2	20	4	18	2	2	230	0.5	4	16	5	0/55	*	0	0	*
	ENDRIN ALDEHYDE	UG/KG	2	20	4	18	2	2	230	0.5	4	16	5	0/55	*	*	*	*
	ENDRIN KETONE	UG/KG	2	20	4	18	2	2	230	0.5	4	16	5	1/55	*	*	*	*
	GAMMA-BHC (LINDANE)	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	GAMMA-CHLORDANE	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	HEPTACHLOR	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.9	10	2	9	1	1	120	0.3	2	4	3	0/55	*	*	*	*
	METHOXYCHLOR	UG/KG	9	100	21	91	11	10	1,200	3	20	400	26	0/55	*	*	*	*
	TOTAL DDTs	UG/KG	5	60	13	55	6	6	720	2	12	140	16	4/55	0	4	0	*
	TOTAL PCBs	UG/KG	140	1,600	340	1,500	170	160	19,000	43	320	100,000	410	0/55	0	0	0	*
	TOXAPHENE	UG/KG	90	1,000	210	910	110	100	12,000	27	200	40,000	260	0/55	*	*	*	*
SULFIDE	SULFIDE	MG/KG	5	18,000	490	18,000	8	6	32,000	320	2,500	5,400,000	1,000	10/64	*	*	*	*
LOW LEVEL SEMIVOLATILES	1,1'-BIPHENYL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	1,2,4-TRICHLOROBENZENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	18	11,000	850	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	0	*	*	*
	1-METHYLNAPHTHALENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	2/37	0	*	*	*
	1-METHYLPHENANTHRENE	UG/KG	18	11,000	870	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	0	*	*	*
	2,3,5-TRIMETHYLNAPHTHALENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	44	27,000	2,100	26,000	700	1,000	78,000	800	4,900	24,000,000	3,400	0/37	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-4-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Wood Hogger Terrestrial

Analysis	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	2,4,6-TRICHLOROPHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	44	27,000	2,200	26,000	750	1,000	77,000	840	5,000	25,000,000	3,600	0/35	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2,6-DIMETHYLNAPHTHALENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	0	*	*	*
	2,6-DINITROTOLUENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2-CHLOROPHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	0	0	0	*
	2-METHYLPHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	2-NITROANILINE	UG/KG	44	27,000	2,100	26,000	700	1,000	78,000	800	4,900	24,000,000	3,400	0/37	*	*	*	*
	2-NITROPHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	3-NITROANILINE	UG/KG	44	27,000	2,100	26,000	700	1,000	78,000	800	4,900	24,000,000	3,400	0/37	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	44	27,000	2,100	26,000	730	1,000	77,000	820	4,900	24,000,000	3,500	0/36	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	4-CHLOROANILINE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	4-METHYLPHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	4-NITROANILINE	UG/KG	44	27,000	2,100	26,000	700	1,000	78,000	800	4,900	24,000,000	3,400	0/37	*	*	*	*
	4-NITROPHENOL	UG/KG	44	27,000	2,100	26,000	700	1,000	78,000	800	4,900	24,000,000	3,400	0/37	*	*	*	*
	ACENAPHTHENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	4/37	0	4	0	*
	ACENAPHTHYLENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	1/37	0	1	0	*
	ANTHRACENE	UG/KG	14	11,000	880	11,000	300	2,100	33,000	330	2,000	4,100,000	1,400	10/37	0	7	1	*
	BENZO(A)ANTHRACENE	UG/KG	12	11,000	810	11,000	310	500	30,000	310	1,900	3,500,000	1,300	11/37	0	4	1	*
	BENZO(A)PYRENE	UG/KG	18	11,000	900	11,000	300	22	33,000	330	2,000	4,100,000	1,500	11/37	0	2	1	*
	BENZO(B)FLUORANTHENE	UG/KG	18	11,000	980	11,000	350	1,500	36,000	330	2,000	4,100,000	1,500	12/37	0	*	*	*
	BENZO(E)PYRENE	UG/KG	18	11,000	810	11,000	230	2,400	30,000	300	1,900	3,400,000	1,300	21/37	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	18	11,000	850	11,000	300	550	32,000	330	2,000	4,000,000	1,400	9/37	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	18	11,000	940	11,000	290	130	35,000	340	2,000	4,200,000	1,500	10/37	0	*	*	*
	BENZOIC ACID	UG/KG	11	27,000	2,100	26,000	700	1,100	79,000	800	4,900	24,000,000	3,500	7/37	*	*	*	*
	BENZYL ALCOHOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	18	11,000	870	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	1/37	*	*	*	*
	CARBAZOLE	UG/KG	18	11,000	830	11,000	200	300	31,000	330	2,000	4,000,000	1,400	12/37	*	*	*	*
	CHRYSENE	UG/KG	18	11,000	1,000	11,000	380	150	38,000	350	2,100	4,400,000	1,600	15/37	0	5	2	*
	DI-N-BUTYLPHTHALATE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERL) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-4-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Wood Hogger Terrestrial

Analyte	Analyte	Unit	Concentration										Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	DI-N-OCTYLPHTHALATE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	18	11,000	850	11,000	300	600	31,000	330	2,000	4,000,000	1,400	4/37	0	3	1	*
	DIBENZOFURAN	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	2/37	*	*	*	*
	DIBENZOTHIOPHENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	3/37	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	FLUORANTHENE	UG/KG	14	14,000	1,200	14,000	260	1,200	45,000	480	2,900	8,500,000	2,000	27/37	0	11	2	*
	FLUORENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	4/37	0	4	0	*
	HEXACHLOROBENZENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	18	11,000	970	11,000	390	550	31,000	380	2,100	4,600,000	1,600	0/32	*	*	*	*
	HEXACHLOROETHANE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	210	130,000	11,000	130,000	4,400	130,000	410,000	3,900	24,000	580,000,000	18,000	27/37	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	17	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	8/37	0	*	*	*
	ISOPHORONE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	180	110,000	8,600	110,000	2,900	220	320,000	3,300	20,000	390,000,000	14,000	18/37	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	NAPHTHALENE	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	1/37	0	0	0	*
	NITROBENZENE	UG/KG	18	11,000	660	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	44	27,000	2,400	26,000	980	1,000	76,000	920	5,200	27,000,000	3,900	4/32	*	*	*	*
	PERYLENE	UG/KG	18	11,000	850	11,000	300	550	32,000	330	2,000	4,000,000	1,400	4/37	0	*	*	*
	PHENANTHRENE	UG/KG	18	11,000	850	11,000	390	240	32,000	310	1,900	3,700,000	1,400	18/37	0	12	2	*
	PHENOL	UG/KG	18	11,000	860	11,000	300	550	32,000	330	2,000	4,000,000	1,400	0/37	*	*	*	*
	PYRENE	UG/KG	18	13,000	1,100	13,000	290	140	41,000	450	2,700	7,500,000	1,900	26/37	0	9	2	*
	TOTAL PAHs	UG/KG	390	240,000	21,000	240,000	7,600	240,000	800,000	7,200	44,000	1,900,000,000	34,000	27/37	0	19	3	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	400	25,000	1,300	25,000	500	500	76,000	410	3,200	10,000,000	1,900	0/60	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	400	25,000	1,300	25,000	500	500	76,000	410	3,200	10,000,000	1,900	0/60	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2-CHLOROPHENOL	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-4-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Wood Hogger Terrestrial

Analysis	Analyte	Unit	Concentration										Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	2-METEYLPHENOL	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	2-NITROANILINE	UG/KG	400	25,000	1,300	25,000	500	500	76,000	410	3,200	10,000,000	1,900	0/60	*	*	*	*
	2-NITROPHENOL	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	3-NITROANILINE	UG/KG	400	25,000	1,300	25,000	500	500	76,000	410	3,200	10,000,000	1,900	0/60	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	400	25,000	1,300	25,000	500	500	76,000	410	3,200	10,000,000	1,900	0/60	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	4-CELORO-3-METHYLPHENOL	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	4-CELORGANILINE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	4-METHYLPHENOL	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	4-NITROANILINE	UG/KG	400	25,000	1,300	25,000	500	500	76,000	410	3,200	10,000,000	1,900	0/60	*	*	*	*
	4-NITROPHENOL	UG/KG	440	25,000	1,300	25,000	500	500	75,000	420	3,200	10,000,000	2,000	0/59	*	*	*	*
	ACENAPHTHENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*
	ACENAPHTHYLENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*
	ANTHRACENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*
	BENZO(A)PYRENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	170	10,000	510	9,800	210	200	31,000	160	1,300	1,600,000	780	1/60	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	170	10,000	520	9,800	210	200	31,000	160	1,300	1,600,000	800	0/60	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	CARBAZOLE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	1/60	*	*	*	*
	CHRYSENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	1/60	0	0	0	*
	DI-N-BUTYLPHCHALATE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*
	DIBENZOFURAN	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	FLUORANTHENE	UG/KG	170	10,000	520	9,800	210	200	31,000	160	1,300	1,600,000	790	1/60	0	1	0	*
	FLUORENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	HEXACHLOROETHANE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	1,700	100,000	5,100	98,000	2,100	2,000	310,000	1,600	13,000	160,000,000	7,800	1/60	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-4-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Wood Hogger Terrestrial

Analysis	Analyte	Units	Concentration										Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
SEMIVOLATILES	ISOPHORONE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	1,200	70,000	3,600	69,000	1,400	1,400	210,000	1,200	8,900	80,000,000	5,500	1/60	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	NAPHTHALENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	0	0	0	*
	NITROBENZENE	UG/KG	170	10,000	510	9,800	210	200	30,000	160	1,300	1,600,000	780	0/60	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	400	25,000	1,300	25,000	500	500	76,000	410	3,200	10,000,000	1,900	0/60	*	*	*	*
	PHENANTHRENE	UG/KG	170	10,000	510	9,800	210	200	31,000	160	1,300	1,600,000	790	1/60	0	1	0	*
	PHENOL	UG/KG	180	10,000	780	9,800	220	200	47,000	190	1,500	2,200,000	1,200	17/60	*	*	*	*
	PYRENE	UG/KG	170	10,000	510	9,800	210	200	31,000	160	1,300	1,600,000	790	1/60	0	0	0	*
	TOTAL PAHs	UG/KG	2,800	170,000	8,600	170,000	3,500	3,400	520,000	2,600	22,000	470,000,000	13,000	1/60	0	1	0	*
TOTAL METALS	ALUMINUM	MG/KG	82.2	32,500	13,100	32,400	12,300	20,600	1,410,000	604	6,280	39,400,000	14,100	108/108	*	*	*	3
	ANTIMONY	MG/KG	0.20	7.1	1.3	6.9	0.84	1.4	139	0.14	1.5	2.2	0.3	59/107	*	18	0	16
	ARSENIC	MG/KG	0.15	37.0	7.6	36.9	5.4	7.2	823	0.61	6.3	40.1	8.5	97/108	12	34	0	2
	BARIUM	MG/KG	1.1	546	134	545	114	183	14,400	9.9	103	10,700	150	108/108	*	*	*	1
	BERYLLIUM	MG/KG	0.010	0.52	0.066	0.51	0.030	0.010	7.2	0.0092	0.095	0.0090	0.082	26/108	*	*	*	10
	CADMIUM	MG/KG	0.010	20.8	0.99	20.8	0.033	0.025	107	0.32	3.4	11.3	1.5	28/108	20	15	3	10
	CALCIUM	MG/KG	132	112,000	9,300	112,000	5,730	10,200	1,000,000	1,390	14,500	209,000,000	11,600	108/108	*	*	*	*
	CHROMIUM	MG/KG	0.18	122	35.8	122	28.5	24.2	3,870	2.1	21.7	472	39.3	105/108	1	4	0	3
	COBALT	MG/KG	0.065	35.6	12.9	35.5	12.4	13.2	1,390	0.63	6.5	42.9	13.9	106/108	*	*	*	0
	COPPER	MG/KG	0.72	607	43.5	606	28.5	20.4	4,690	6.1	63.5	4,030	53.6	104/108	15	43	1	9
	IRON	MG/KG	367	90,300	24,400	89,900	20,600	42,500	2,630,000	1,390	14,500	210,000,000	26,700	108/108	*	*	*	*
	LEAD	MG/KG	0.35	728	53.8	728	12.3	5.8	5,810	11.1	115	13,300	72.3	106/108	24	24	6	15
	MAGNESIUM	MG/KG	81.6	21,500	8,580	21,400	7,870	15,400	927,000	366	3,800	14,400,000	9,190	108/108	*	*	*	*
	MANGANESE	MG/KG	4.3	1,470	431	1,470	377	652	46,500	26.9	280	78,300	476	108/108	*	*	*	0
	MERCURY	MG/KG	0.025	7.1	0.32	7.1	0.080	0.030	34.0	0.10	1.1	1.2	0.49	53/107	9	28	5	14
	MOLYBDENUM	MG/KG	0.065	12.9	0.92	12.8	0.12	0.095	98.9	0.18	1.8	3.3	1.2	32/108	*	*	*	3
	NICKEL	MG/KG	0.33	119	43.4	119	36.3	53.2	4,680	2.5	25.9	673	47.5	105/108	2	90	32	0
	POTASSIUM	MG/KG	59.3	6,120	2,220	6,060	1,810	1,500	239,000	136	1,410	1,990,000	2,440	108/108	*	*	*	*
	SELENIUM	MG/KG	0.24	4.8	0.68	4.6	0.43	0.43	73.4	0.060	0.62	0.39	0.78	4/108	4	3	1	*
	SILVER	MG/KG	0.055	4.4	0.22	4.3	0.075	0.060	23.8	0.049	0.51	0.26	0.30	10/108	5	5	1	*
	SODIUM	MG/KG	14.3	275,000	9,220	275,000	2,220	35,900	996,000	2,790	29,000	841,000,000	13,900	105/108	*	*	*	*
	THALLIUM	MG/KG	0.043	2.4	0.48	2.4	0.26	0.24	51.4	0.044	0.46	0.21	0.55	11/108	*	*	*	2
	VANADIUM	MG/KG	0.28	163	55.7	163	51.7	64.3	6,010	2.4	24.8	617	59.6	108/108	*	*	*	5
	ZINC	MG/KG	3.9	3,010	188	3,010	71.5	3,010	20,300	39.2	407	166,000	253	96/108	25	27	11	17
TPH EXTRACTABLES	DIESEL RANGE ORGANICS	MG/KG	6	2,300	340	2,300	7	6	2,400	330	870	750,000	970	1/7	*	*	*	*
	MOTOR OIL RANGE ORGANICS	MG/KG	6	8,900	1,400	8,900	7	6	9,600	1,300	3,300	11,000,000	3,800	2/7	*	*	*	*
TPH PURGEABLES	GASOLINE RANGE ORGANICS	MG/KG	0.3	26	4	26	0.3	0.3	28	4	10	94	11	2/7	*	*	*	*
VOLATILES	1,1,1-TRICHLOROETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	1,1,2,2-TETRACHLOROETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-4-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

Wood Hogger Terrestrial

Analyte	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
VOLATILES	1,1,2-TRICHLOROETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	1,1-DICHLOROETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	1,1-DICHLOROETHENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	1,2-DICHLOROETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	1,2-DICHLOROETHENE (TOTAL)	UG/KG	6	39	12	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	1,2-DICHLOROPROPANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	2-BUTANONE	UG/KG	6	720	30	710	6	6	1,700	14	100	11,000	53	3/55	*	*	*	*
	2-HEXANONE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	4-METHYL-2-PENTANONE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	ACETONE	UG/KG	6	850	76	840	26	55	4,200	19	140	20,000	110	1/55	*	*	*	*
	BENZENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	BROMODICHLOROMETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	BROMOFORM	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	BROMOMETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	CARBON DISULFIDE	UG/KG	6	290	20	280	6	6	1,100	6	42	1,800	30	8/55	*	*	*	*
	CARBON TETRACHLORIDE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	CHLOROBENZENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	CHLOROETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	CHLOROFORM	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	CHLOROMETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	CIS-1,3-DICHLOROPROPENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	DIBROMOCHLOROMETHANE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	ETHYLBENZENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	METHYLENE CHLORIDE	UG/KG	6	49	12	43	6	6	660	1	10	110	14	0/55	*	*	*	*
	STYRENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	TETRACHLOROETHENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	TOLUENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	TRANS-1,3-DICHLOROPROPENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	TRICHLOROETHENE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	VINYL CHLORIDE	UG/KG	6	39	11	33	6	6	590	1	8	66	13	0/55	*	*	*	*
	XYLENE (TOTAL)	UG/KG	6	54	11	49	6	6	620	1	10	95	13	2/55	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-4-B

Statistical Summary of Surface Water Results

Wood Hogger Site (Site 11)

Analysis	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/L	7	24	14	17	14	24	110	2	5	26	17	8/8	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	1,3-DINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	2,4,6-TRINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	2,4-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	2,6-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	2-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	3-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	4-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	HMX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	NITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	RDX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.5	0.002	0.007	0	0.07	0/8	*
	TETRYL	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.3	0.003	0.007	0	0.07	0/5	*
PESTICIDES AND PCBs	4,4'-DDD	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	*
	4,4'-DDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	*
	4,4'-DDT	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	0
	ALDRIN	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	0
	ALPHA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	*
	ALPHA-CHLORDANE	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	*
	AROCLOR-1016	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	2	0.001	0.004	0	0.3	0/8	0
	AROCLOR-1221	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	2	0.001	0.004	0	0.3	0/8	0
	AROCLOR-1232	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	2	0.001	0.004	0	0.3	0/8	0
	AROCLOR-1242	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	2	0.001	0.004	0	0.3	0/8	0
	AROCLOR-1248	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	2	0.001	0.004	0	0.3	0/8	0
	AROCLOR-1254	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	2	0.001	0.004	0	0.3	0/8	0
	AROCLOR-1260	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	2	0.001	0.004	0	0.3	0/8	0
	BETA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	*
	DELTA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	*
	DIELDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	0
	ENDOSULFAN I	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	0
	ENDOSULFAN II	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	0
	ENDOSULFAN SULFATE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	*
	ENDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	0
	ENDRIN ALDEHYDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	*
	ENDRIN KETONE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.4	0	0	0	0.05	0/8	*
	GAMMA-BHC (LINDANE)	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	0
	GAMMA-CHLORDANE	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	*
	HEPTACHLOR	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.2	0.0001	0.0004	0	0.03	0/8	0
	HEPTACHLOR EPOXIDE	UG/L	0.005	0.005	0.005	0	0.005	0.005	0.04	0	0	0	0.005	0/8	0
	METHOXYCHLOR	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	2	0.001	0.004	0	0.3	0/8	0
	TOTAL DDTs	UG/L	0.2	0.2	0.2	0	0.2	0.2	1	0	0	0	0.2	0/8	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-4-B

Statistical Summary of Surface Water Results

Wood Hogger Site (Site 11)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
PESTICIDES AND PCBs	TOTAL PCBs	UG/L	2	2	2	0.05	2	2	14	0.006	0.02	0.0003	2	0/8	*
	TOXAPHENE	UG/L	2	2	2	0.05	2	2	12	0.006	0.02	0.0003	2	0/8	*
TOTAL SUSPENDED SOLIDS	TOTAL SUSPENDED SOLIDS	MG/L	5	140	38	130	25	9	300	16	44	1,900	67	7/8	*
SEMIVOLATILES	1,2,4-TRICHLORCBENZENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	1,2-DICHLOROBENZENE	UG/L	3	13	4	10	3	3	30	1	4	13	6	0/8	*
	1,3-DICHLOROBENZENE	UG/L	3	13	4	10	3	3	30	1	4	13	6	0/8	*
	1,4-DICHLOROBENZENE	UG/L	3	13	4	10	3	3	30	1	4	13	6	0/8	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2,4,5-TRICHLOROPHENOL	UG/L	13	60	19	48	13	13	150	6	17	280	30	0/8	*
	2,4,6-TRICHLOROPHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2,4-DICHLOROPHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2,4-DIMETHYLPHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2,4-DINITROPHENOL	UG/L	13	60	19	48	13	13	150	6	17	280	30	0/8	*
	2,4-DINITROTOLUENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2,6-DINITROTOLUENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2-CHLORONAPHTHALENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2-CHLOROPHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2-METHYLNAPHTHALENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2-METHYLPHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	2-NITROANILINE	UG/L	13	60	19	48	13	13	150	6	17	280	30	0/8	*
	2-NITROPHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	3,3'-DICHLOROBENZIDINE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	3-NITROANILINE	UG/L	13	60	19	48	13	13	150	6	17	280	30	0/8	*
	4,6-DINITRO-2-METHYLPHENOL	UG/L	13	60	19	48	13	13	150	6	17	280	30	0/8	*
	4-BROMOPHENYL-PHENYLETHER	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	4-CHLORO-3-METHYLPHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	4-CHLOROANILINE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	4-CHLOROPHENYL-PHENYLETHER	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	4-METHYLPHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	4-NITROANILINE	UG/L	13	60	19	48	13	13	150	6	17	280	30	0/8	*
	4-NITROPHENOL	UG/L	13	60	19	48	13	13	150	6	17	280	30	0/8	*
	ACENAPHTHENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	ACENAPHTHYLENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	ANTHRACENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	BENZO(A)ANTHRACENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	BENZO(A)PYRENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	BENZO(B)FLUORANTHENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	BENZO(G,H,I)PERYLENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	BENZO(K)FLUORANTHENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	BIS(2-CHLOROETHOXY)METHANE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-4-B

Statistical Summary of Surface Water Results

Wood Hogger Site (Site 11)

Analytes	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	USEPA Guidance Values
SEMIVOLATILES	BIS(2-CHLOROETHYL) ETHER	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	BIS(2-ETHYLHEXYL) PHTHALATE	UG/L	2	10	3	8	2	2	26	1	3	8	5	0/8	*
	BUTYLBENZYLPHTHALATE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	CARBAZOLE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	CHRYSENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	DI-N-BUTYLPHTHALATE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	DI-N-OCTYLPHTHALATE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	DIBENZ(A,H)ANTHRACENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	DIBENZOFURAN	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	DIETHYLPHTHALATE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	DIMETHYLPHTHALATE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	FLUORANTHENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	FLUORENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	HEXACHLOROBENZENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	HEXACHLOROBUTADIENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	HEXACHLOROCYCLOPENTADIENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	HEXACHLOROETHANE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	HIGH MOLECULAR PAHs	UG/L	50	250	75	200	50	50	600	25	71	5,000	120	0/8	*
	INDENO(1,2,3-CD)PYRENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	ISOPHORONE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	LOW MOLECULAR PAHs	UG/L	35	180	53	140	35	35	420	18	49	2,500	86	0/8	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	N-NITROSODIPHENYLAMINE (1)	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	NAPHTHALENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	NITROBENZENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	PENTACHLOROPHENOL	UG/L	13	60	19	48	13	13	150	6	17	280	30	0/8	0
	PHENANTHRENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	PHENOL	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	PYRENE	UG/L	5	25	8	20	5	5	60	3	7	50	12	0/8	*
	TOTAL PAHs	UG/L	85	430	130	340	85	85	1,000	43	120	14,000	270	0/8	0
TOTAL METALS	ALUMINUM	UG/L	61.5	748	260	687	186	748	2,080	84.2	238	56,700	419	5/8	5
	ANTIMONY	UG/L	0.80	3.6	1.6	2.8	1.2	0.80	12.7	0.35	1.0	0.99	2.3	2/8	*
	ARSENIC	UG/L	1.4	11.8	3.4	10.4	2.4	2.4	27.3	1.2	3.5	11.9	5.7	3/8	0
	BARIUM	UG/L	36.5	173	107	137	108	173	854	13.8	39.0	1,520	133	8/8	*
	BERYLLIUM	UG/L	0.050	0.10	0.063	0.050	0.050	0.050	0.50	0.0082	0.023	0.00054	0.078	0/8	*
	CADMIUM	UG/L	0.10	2.5	0.55	2.4	0.24	0.10	4.5	0.29	0.81	0.66	1.1	2/8	1
	CALCIUM	UG/L	40,300	108,000	64,700	67,700	54,000	108,000	518,000	8,330	23,600	555,000,000	80,500	8/8	*
	CHROMIUM	UG/L	0.25	1.9	0.93	1.7	0.90	0.90	7.5	0.20	0.57	0.32	1.3	3/8	0
	COBALT	UG/L	0.36	1.0	0.61	0.64	0.56	0.55	4.9	0.068	0.19	0.037	0.74	5/8	*
	COPPER	UG/L	1.5	13.7	7.8	12.2	7.8	11.6	62.7	1.6	4.4	19.5	10.8	7/8	6
	IRON	UG/L	537	2,500	1,110	1,960	751	2,500	8,850	243	687	471,000	1,570	8/8	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-4-B

Statistical Summary of Surface Water Results

Wood Hogger Site (Site 11)

Analysis	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL METALS	LEAD	UG/L	0.40	3.7	1.4	3.3	1.0	1.0	11.3	0.42	1.2	1.4	2.2	2/8	1
	MAGNESIUM	UG/L	50,100	268,000	130,000	218,000	115,000	268,000	1,040,000	24,900	70,500	4,980,000,000	177,000	8/8	*
	MANGANESE	UG/L	107	1,950	450	1,840	241	1,950	3,600	219	619	383,000	865	8/8	*
	MERCURY	UG/L	0.050	0.20	0.075	0.15	0.050	0.050	0.60	0.019	0.053	0.0029	0.11	1/8	1
	MOLYBDENUM	UG/L	0.55	7.3	2.2	6.8	1.7	7.3	17.9	0.77	2.2	4.8	3.7	3/8	*
	NICKEL	UG/L	1.7	6.2	3.7	4.6	3.4	1.7	29.7	0.63	1.8	3.2	4.9	6/8	0
	POTASSIUM	UG/L	15,100	73,300	39,800	58,200	33,200	73,300	318,000	6,940	19,600	386,000,000	52,900	8/8	*
	SELENIUM	UG/L	1.2	2.0	1.6	0.80	1.7	2.0	13.1	0.11	0.32	0.10	1.8	0/8	0
	SILVER	UG/L	0.25	0.60	0.38	0.35	0.33	0.60	3.0	0.051	0.14	0.021	0.47	0/8	0
	SODIUM	UG/L	415,000	2,200,000	1,060,000	1,790,000	912,000	2,200,000	8,450,000	203,000	575,000	.33100E+12	1,440,000	8/8	*
	THALLIUM	UG/L	0.95	1.8	1.2	0.85	0.98	0.95	9.4	0.14	0.39	0.15	1.4	0/8	*
	VANADIUM	UG/L	0.85	10.4	2.9	9.6	1.4	10.4	23.2	1.2	3.3	11.1	5.1	2/8	*
	ZINC	UG/L	3.4	329	130	325	89.9	329	1,040	45.9	130	16,900	217	6/8	5
VOLATILES	1,1,1-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	1,1,2,2-TETRACHLOROETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	1,1,2-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	1,1-DICHLOROETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	1,1-DICHLOROETHENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	1,2-DICHLOROETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	1,2-DICHLOROETHENE (TOTAL)	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	1,2-DICHLOROPROPANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	2-BUTANONE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	2-HEXANONE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	4-METHYL-2-PENTANONE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	ACETONE	UG/L	5	7	5	2	5	5	43	0.3	0.7	0.6	6	0/8	*
	BENZENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	BROMODICHLOROMETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	BROMOFORM	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	BROMOMETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	CARBON DISULFIDE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	CARBON TETRACHLORIDE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	CHLOROBENZENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	CHLOROETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	CHLOROFORM	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	CHLOROMETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	CIS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	DIBROMOCHLOROMETHANE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	ETHYLBENZENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	METHYLENE CHLORIDE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	STYRENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	TETRACHLOROETHENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-4-B

Statistical Summary of Surface Water Results

Wood Hogger Site (Site 11)

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	(Confidence Level) (95%)	Total	>=QEA Guidance Values
VOLATILES	TOLUENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	TRANS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	TRICHLOROETHENE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	VINYL CHLORIDE	UG/L	5	5	5	0	5	5	40	0	0	0	5	0/8	*
	XYLENE (TOTAL)	UG/L	5	8	5	3	5	5	43	0.4	1	1	6	1/8	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-5-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

North Otter Sluice Aquatic

Analyses	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/KG	11,000	69,000	40,000	58,000	39,000	69,000	400,000	5,900	19,000	340,000,000	51,000	10/10	*	*	*	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	1,3-DINITROBENZENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	2,4,6-TRINITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	2,6-DINITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	2-NITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	3-NITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	4-NITROTOLUENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	HMX	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	NITROBENZENE	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	RDX	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
	TETRYL	UG/KG	60	60	60	0	60	60	60	0	0	0	51,000	0/1	*	*	*	*
LOW LEVEL PESTICIDES AND PCBs	2,4'-DDD	UG/KG	0.1	1	0.4	0.9	0.4	1	4	0.09	0.3	0.08	0.6	6/10	*	*	*	*
	2,4'-DDE	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	2,4'-DDT	UG/KG	0.1	0.4	0.2	0.3	0.2	0.2	2	0.02	0.07	0.006	0.2	1/10	*	*	*	*
	4,4'-DDD	UG/KG	0.2	2	1	2	1	0.6	11	0.2	0.6	0.4	1	8/10	*	1	0	*
	4,4'-DDE	UG/KG	0.1	3	2	3	2	1	17	0.3	0.8	0.6	2	9/10	*	3	0	*
	4,4'-DDT	UG/KG	0.1	1	0.4	0.8	0.2	1	4	0.1	0.3	0.1	0.6	4/10	*	0	0	*
	ALDRIN	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	0.1	1	0.3	1	0.2	0.2	3	0.1	0.3	0.1	0.5	2/10	*	*	*	*
	DIELDRIN	UG/KG	0.1	0.6	0.3	0.5	0.2	0.2	3	0.05	0.2	0.03	0.3	2/10	0	2	0	*
	GAMMA-BHC (LINDANE)	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	HEPTACHLOR	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	HEXACHLOROBENZENE	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	0	*	*	*
	MIREX	UG/KG	0.09	0.2	0.2	0.2	0.2	0.2	2	0.02	0.05	0.003	0.2	2/10	*	*	*	*
	PCB-101 (2,2',3,5,5')	UG/KG	0.1	1	0.3	0.9	0.2	1	3	0.09	0.3	0.07	0.5	6/10	*	*	*	*
	PCB-105 (2,3,3',4,4')	UG/KG	0.1	0.7	0.3	0.5	0.2	0.1	3	0.06	0.2	0.04	0.4	2/10	*	*	*	*
	PCB-118 (2,3',4,4',5)	UG/KG	0.1	1	0.4	1	0.3	1	4	0.1	0.3	0.1	0.6	6/10	*	*	*	*
	PCB-126 (3,3',4,4',5)	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	PCB-128 (2,2',3,3',4,4')	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	PCB-138 (2,2',3,4,4',5')	UG/KG	0.1	2	0.5	1	0.3	0.3	5	0.1	0.5	0.2	0.8	7/10	*	*	*	*
	PCB-153 (2,2',4,4',5,5')	UG/KG	0.1	1	0.4	1	0.3	1	4	0.1	0.4	0.2	0.7	6/10	*	*	*	*
	PCB-170 (2,2',3,3',4,4',5)	UG/KG	0.1	0.4	0.2	0.3	0.2	0.2	2	0.03	0.08	0.006	0.2	1/10	*	*	*	*
	PCB-18 (2,2',5)	UG/KG	0.1	0.3	0.2	0.2	0.2	0.3	2	0.02	0.05	0.002	0.2	5/10	*	*	*	*
	PCB-180 (2,2',3,4,4',5,5')	UG/KG	0.1	0.8	0.3	0.7	0.2	0.1	3	0.09	0.3	0.08	0.5	3/10	*	*	*	*
	PCB-187 (2,2',3,4',5,5',6)	UG/KG	0.1	0.5	0.2	0.4	0.2	0.1	2	0.04	0.1	0.02	0.3	2/10	*	*	*	*
	PCB-195 (2,2',3,3',4,4',5,6)	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	PCB-206 (2,2,',3,3',4,4',5,5',	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.003	0.2	1/10	*	*	*	*
	PCB-209 (2,2',3,3',4,4',5,5',6	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-5-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

North Otter Sluice Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL PESTICIDES AND PCBs	PCB-28 (2,4,4')	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	PCB-44 (2,2',3,5')	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	PCB-52 (2,2',5,5')	UG/KG	0.1	1	0.7	1	0.7	1	7	0.2	0.5	0.3	1	8/10	*	*	*	*
	PCB-66 (2,3',4,4')	UG/KG	0.1	0.2	0.2	0.1	0.2	0.2	2	0.02	0.05	0.002	0.2	0/10	*	*	*	*
	PCB-77 (3,3',4,4')	UG/KG	0.1	1	0.2	0.9	0.2	0.2	2	0.09	0.3	0.07	0.4	1/10	*	*	*	*
	PCB-8 (2,4')	UG/KG	0.1	1	0.5	1	0.3	1	5	0.1	0.4	0.2	0.7	5/10	*	*	*	*
	TOTAL DDTs	UG/KG	1	7	4	6	4	4	39	0.5	2	3	5	10/10	0	9	0	*
	TOTAL PCBs	UG/KG	3	10	6	8	6	7	55	0.8	3	7	7	9/10	0	0	0	*
	TRANS-NONACHLOR	UG/KG	0.1	1	0.3	1	0.2	0.2	3	0.1	0.4	0.1	0.5	2/10	*	*	*	*
SULFIDE	SULFIDE	MG/KG	11	13,000	2,700	13,000	660	13,000	27,000	1,300	4,000	16,000,000	5,000	9/10	*	*	*	*
LOW LEVEL SEMIVOLATILES	1,1'-BIPHENYL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	1,2,4-TRICHLOROBENZENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	1-METHYLNAPHTHALENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	0	*	*	*
	1-METHYLPHENANTHRENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	0	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2,3,5-TRIMETHYLNAPHTHALENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	0	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	190	1,000	580	820	440	1,000	5,800	110	340	120,000	770	0/10	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	190	1,000	580	820	440	1,000	5,800	110	340	120,000	770	0/10	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2,6-DIMETHYLNAPHTHALENE	UG/KG	53	400	170	340	120	400	1,700	37	120	14,000	240	4/10	0	*	*	*
	2,6-DINITROTOLUENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2-CHLOROPHENOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	42	400	220	350	150	400	2,200	46	150	21,000	300	1/10	0	0	0	*
	2-METHYLPHENOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	2-NITROANILINE	UG/KG	190	1,000	580	820	440	1,000	5,800	110	340	120,000	770	0/10	*	*	*	*
	2-NITROPHENOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	3-NITROANILINE	UG/KG	190	1,000	580	820	440	1,000	5,800	110	340	120,000	770	0/10	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	190	1,000	580	820	440	1,000	5,800	110	340	120,000	770	0/10	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	4-CHLOROANILINE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-5-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

North Otter Sluice Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	4-METHYLPHENOL	UG/KG	34	740	240	710	150	740	2,400	71	220	50,000	370	3/10	*	*	*	*
	4-NITROANILINE	UG/KG	190	1,000	580	820	440	1,000	5,800	110	340	120,000	770	0/10	*	*	*	*
	4-NITROPHENOL	UG/KG	190	1,000	580	820	440	1,000	5,800	110	340	120,000	770	0/10	*	*	*	*
	ACENAPHTHENE	UG/KG	30	400	220	370	180	400	2,200	46	150	21,000	300	1/10	0	1	0	*
	ACENAPHTHYLENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	0	0	0	*
	ANTHRACENE	UG/KG	30	400	210	370	150	400	2,100	49	160	24,000	300	2/10	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	22	400	170	370	75	400	1,700	50	160	25,000	260	5/10	0	0	0	*
	BENZO(A)PYRENE	UG/KG	35	400	170	360	78	400	1,700	50	160	25,000	260	5/10	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	39	400	170	360	79	400	1,700	49	160	24,000	260	5/10	0	*	*	*
	BENZO(E)PYRENE	UG/KG	31	400	190	360	130	400	1,900	53	170	28,000	290	4/10	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	51	400	200	340	140	400	2,000	50	160	25,000	300	3/10	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	24	400	160	370	74	400	1,600	51	160	26,000	260	5/10	0	*	*	*
	BENZOIC ACID	UG/KG	71	1,000	330	930	240	1,000	3,300	110	330	110,000	530	8/10	*	*	*	*
	BENZYL ALCOHOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	CARBAZOLE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	CHRYSENE	UG/KG	38	400	170	360	86	400	1,700	49	150	24,000	260	5/10	0	0	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	0	0	0	*
	DIBENZOFURAN	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	DIBENZOTHIOPHENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	FLUORANTHENE	UG/KG	45	400	190	350	160	400	1,900	42	130	17,000	270	6/10	0	0	0	*
	FLUORENE	UG/KG	25	400	220	370	180	400	2,200	45	150	21,000	300	1/10	0	1	0	*
	HEXACHLOROBENZENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	0	*	*	*
	HEXACHLOROBUTADIENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	75	400	220	320	180	400	1,800	47	130	18,000	310	0/8	*	*	*	*
	HEXACHLOROETHANE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	660	4,700	2,200	4,100	1,500	4,700	22,000	510	1,600	2,600,000	3,100	7/10	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	37	400	180	360	140	400	1,800	47	150	22,000	270	3/10	0	*	*	*
	ISOPHORONE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	750	4,000	2,200	3,200	1,600	4,000	22,000	440	1,400	2,000,000	3,000	3/10	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*
	NAPHTHALENE	UG/KG	75	400	240	320	200	400	2,400	41	130	17,000	310	2/10	0	2	0	*
	NITROBENZENE	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-5-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

North Otter Sluice Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM
LOW LEVEL SEMIVOLATILES	PENTACHLOROPHENOL	UG/KG	190	1,000	580	820	440	1,000	5,800	110	340	120,000	770	0/10	*	*	*
	PERYLENE	UG/KG	46	400	190	350	140	400	1,900	45	140	20,000	270	3/10	0	*	*
	PHENANTHRENE	UG/KG	25	400	210	370	150	400	2,100	49	150	24,000	300	3/10	0	0	0
	PHENOL	UG/KG	75	400	230	320	180	400	2,300	43	130	18,000	310	0/10	*	*	*
	PYRENE	UG/KG	55	400	150	340	110	400	1,500	34	110	11,000	210	7/10	0	0	0
	TOTAL PAHs	UG/KG	1,600	12,000	5,700	11,000	3,500	12,000	57,000	1,400	4,300	18,000,000	8,100	7/10	0	3	0
TOTAL METALS	ALUMINUM	MG/KG	13,500	30,300	22,900	16,800	23,500	30,300	320,000	1,350	5,050	25,500,000	25,300	14/14	*	*	*
	ANTIMONY	MG/KG	0.60	7.1	1.8	6.5	1.1	0.95	23.0	0.50	1.8	3.2	2.7	5/13	*	3	0
	ARSENIC	MG/KG	9.0	47.2	18.9	38.2	15.4	47.2	265	2.8	10.5	110	23.9	14/14	7	14	0
	BARIUM	MG/KG	57.3	196	93.4	139	90.3	196	1,310	8.3	31.2	976	108	14/14	*	*	*
	BERYLLIUM	MG/KG	0.020	0.085	0.035	0.065	0.030	0.045	0.49	0.0046	0.017	0.00030	0.043	0/14	*	*	*
	CADMIUM	MG/KG	0.035	0.68	0.13	0.65	0.058	0.045	1.8	0.050	0.19	0.035	0.22	2/14	2	0	0
	CALCIUM	MG/KG	2,500	7,210	5,000	4,710	4,690	7,210	70,100	409	1,530	2,340,000	5,730	14/14	*	*	*
	CHROMIUM	MG/KG	46.3	319	90.5	273	80.7	81.7	1,270	18.0	67.4	4,540	122	14/14	1	7	0
	COBALT	MG/KG	7.2	31.5	20.8	24.3	20.8	19.3	292	1.6	6.0	36.3	23.7	14/14	*	*	0
	COPPER	MG/KG	46.6	272	78.5	225	63.4	272	1,100	15.4	57.5	3,300	106	14/14	5	14	1
	IRON	MG/KG	27,400	135,000	48,800	108,000	41,100	135,000	683,000	7,180	26,900	722,000,000	61,500	14/14	*	*	*
	LEAD	MG/KG	23.0	182	68.7	159	47.1	182	962	12.3	45.9	2,100	90.4	14/14	8	7	0
	MAGNESIUM	MG/KG	6,520	15,600	12,100	9,080	12,200	15,600	169,000	667	2,500	6,240,000	13,300	14/14	*	*	*
	MANGANESE	MG/KG	144	897	483	753	446	897	6,760	49.5	185	34,300	571	14/14	*	*	*
	MERCURY	MG/KG	0.075	0.92	0.45	0.85	0.41	0.56	6.3	0.059	0.22	0.049	0.56	12/14	7	12	2
	MOLYBDENUM	MG/KG	0.19	53.7	4.4	53.5	0.41	0.65	60.9	3.8	14.2	202	11.1	2/14	*	*	*
	NICKEL	MG/KG	32.0	140	81.4	108	79.5	76.4	1,140	6.8	25.6	656	93.5	14/14	2	14	13
	POTASSIUM	MG/KG	2,390	5,440	4,090	3,050	4,110	5,440	57,300	223	835	698,000	4,490	14/14	*	*	*
	SELENIUM	MG/KG	0.60	1.6	1.0	1.0	0.58	1.1	14.0	0.083	0.31	0.097	1.1	0/14	0	0	0
	SILVER	MG/KG	0.11	0.62	0.21	0.51	0.17	0.14	3.0	0.035	0.13	0.017	0.27	1/14	1	0	0
	SODIUM	MG/KG	1,450	10,800	4,660	9,350	4,180	10,800	65,300	713	2,670	7,110,000	5,920	14/14	*	*	*
	THALLIUM	MG/KG	0.37	0.95	0.59	0.59	0.58	0.55	8.2	0.048	0.18	0.032	0.67	0/14	*	*	*
	VANADIUM	MG/KG	66.1	102	85.9	35.9	87.5	96.8	1,200	3.4	12.6	158	91.8	14/14	*	*	*
	ZINC	MG/KG	146	496	267	350	237	496	3,730	28.6	107	11,400	317	14/14	12	13	2

Analysis	Analyte	Unit	Detection Frequency			
			>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	PENTACHLOROPHENOL	UG/KG	*	*	*	*
	PERYLENE	UG/KG	0	*	*	*
	PHENANTHRENE	UG/KG	0	0	0	*
	PHENOL	UG/KG	*	*	*	*
	PYRENE	UG/KG	0	0	0	*
	TOTAL PAHs	UG/KG	0	3	0	*
TOTAL METALS	ALUMINUM	MG/KG	*	*	*	3
	ANTIMONY	MG/KG	*	3	0	3
	ARSENIC	MG/KG	7	14	0	3
	BARIUM	MG/KG	*	*	*	0
	BERYLLIUM	MG/KG	*	*	*	0
	CADMIUM	MG/KG	2	0	0	0
	CALCIUM	MG/KG	*	*	*	*
	CHROMIUM	MG/KG	1	7	0	3
	COBALT	MG/KG	*	*	*	0
	COPPER	MG/KG	5	14	1	3
	IRON	MG/KG	*	*	*	*
	LEAD	MG/KG	8	7	0	3
	MAGNESIUM	MG/KG	*	*	*	*
	MANGANESE	MG/KG	*	*	*	0
	MERCURY	MG/KG	7	12	2	11
	MOLYBDENUM	MG/KG	*	*	*	1
	NICKEL	MG/KG	2	14	13	1
	POTASSIUM	MG/KG	*	*	*	*
	SELENIUM	MG/KG	0	0	0	*
	SILVER	MG/KG	1	0	0	*
	SODIUM	MG/KG	*	*	*	*
	THALLIUM	MG/KG	*	*	*	0
	VANADIUM	MG/KG	*	*	*	5
	ZINC	MG/KG	12	13	2	6

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-5-B

Statistical Summary of Surface Water Results

North Otter Sluice

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/L	2	24	7	22	5	5	170	1	5	26	9	24/24	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	1,3-DINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	2,4,6-TRINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	2,4-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	2,6-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	2-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	3-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	4-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	HMX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	NITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.001	0.007	0	0.06	0/23	*
	RDX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/21	*
	TETRYL	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/20	*
PESTICIDES AND PCBs	4,4'-DDD	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/26	*
	4,4'-DDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/26	*
	4,4'-DDT	UG/L	0.03	0.05	0.05	0.02	0.05	0.05	1	0.0009	0.005	0	0.05	1/26	1
	ALDRIN	UG/L	0.01	0.03	0.02	0.01	0.03	0.03	0.6	0.0005	0.003	0	0.03	1/26	0
	ALPHA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.7	0	0.0002	0	0.03	0/26	*
	ALPHA-CHLORDANE	UG/L	0.03	0.04	0.03	0.02	0.03	0.03	0.7	0.0007	0.003	0	0.03	1/26	*
	AROCLOR-1016	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	7	0.0004	0.002	0	0.3	0/26	0
	AROCLOR-1221	UG/L	0.3	0.5	0.3	0.3	0.3	0.3	7	0.02	0.08	0.007	0.3	0/26	0
	AROCLOR-1232	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	7	0.0004	0.002	0	0.3	0/26	0
	AROCLOR-1242	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	7	0.0004	0.002	0	0.3	0/26	0
	AROCLOR-1248	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	7	0.0004	0.002	0	0.3	0/26	0
	AROCLOR-1254	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	7	0.0004	0.002	0	0.3	0/26	0
	AROCLOR-1260	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	7	0.0004	0.002	0	0.3	0/26	0
	BETA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.7	0	0.0002	0	0.03	0/26	*
	DELTA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.7	0	0.0002	0	0.03	0/26	*
	DIELDRIN	UG/L	0.03	0.05	0.05	0.02	0.05	0.05	1	0.0009	0.005	0	0.05	1/26	1
	ENDOSULFAN I	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.7	0	0.0002	0	0.03	0/26	0
	ENDOSULFAN II	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/26	0
	ENDOSULFAN SULFATE	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/26	*
	ENDRIN	UG/L	0.03	0.05	0.05	0.02	0.05	0.05	1	0.0009	0.004	0	0.05	1/26	1
	ENDRIN ALDEHYDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/26	*
	ENDRIN KETONE	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/26	*
	GAMMA-BHC (LINDANE)	UG/L	0.01	0.03	0.02	0.01	0.03	0.03	0.6	0.0005	0.003	0	0.03	1/26	0
	GAMMA-CHLORDANE	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.7	0	0.0002	0	0.03	0/26	*
	HEPTACHLOR	UG/L	0.005	0.1	0.03	0.1	0.03	0.03	0.7	0.004	0.02	0.0003	0.03	2/26	2
	HEPTACHLOR EPOXIDE	UG/L	0.005	0.005	0.005	0	0.005	0.005	0.1	0	0	0	0.005	0/26	0
	METHOXYCHLOR	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	7	0.0004	0.002	0	0.3	0/26	0
	TOTAL DDTs	UG/L	0.1	0.2	0.1	0.05	0.2	0.2	4	0.002	0.01	0.0001	0.2	1/26	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-5-B

Statistical Summary of Surface Water Results

North Otter Sluice

Analysis	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
PESTICIDES AND PCBs	TOTAL PCBs	UG/L	2	2	2	0.3	2	2	46	0.02	0.08	0.007	2	0/26	*
	TOXAPHENE	UG/L	2	2	2	0.05	2	2	39	0.003	0.01	0.0002	2	0/26	*
TOTAL SUSPENDED SOLIDS	TOTAL SUSPENDED SOLIDS	MG/L	5	130	40	130	24	5	970	9	43	1,800	55	20/24	*
SULFIDE	SULFIDE	MG/L	0.05	0.05	0.05	0	0.05	0.05	0.05	0	0	0	55	0/1	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	1,2-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	65	0	0	0	3	0/26	*
	1,3-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	65	0	0	0	3	0/26	*
	1,4-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	65	0	0	0	3	0/26	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2,4,5-TRICHLOROPHENOL	UG/L	13	13	13	0.5	13	13	330	0.03	0.2	0.03	13	0/26	*
	2,4,6-TRICHLOROPHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2,4-DICHLOROPHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2,4-DIMETHYLPHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2,4-DINITROPHENOL	UG/L	13	13	13	0.5	13	13	330	0.03	0.2	0.03	13	0/26	*
	2,4-DINITROTOLUENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2,6-DINITROTOLUENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2-CHLORONAPETHALENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2-CHLOROPHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2-METHYLNAPETHALENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2-METHYLPHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	2-NITROANILINE	UG/L	13	13	13	0.5	13	13	330	0.03	0.2	0.03	13	0/26	*
	2-NITROPHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	3,3'-DICHLOROBENZIDINE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	3-NITROANILINE	UG/L	13	13	13	0.5	13	13	330	0.03	0.2	0.03	13	0/26	*
	4,6-DINITRO-2-METHYLPHENOL	UG/L	13	13	13	0.5	13	13	330	0.03	0.2	0.03	13	0/25	*
	4-BROMOPHENYL-PHENYLETHER	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	4-CHLORO-3-METHYLPHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	4-CHLOROANILINE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	4-CHLOROPHENYL-PHENYLETHER	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	4-METHYLPHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	4-NITROANILINE	UG/L	13	13	13	0.5	13	13	330	0.03	0.2	0.03	13	0/26	*
	4-NITROPHENOL	UG/L	13	13	13	0.5	13	13	330	0.03	0.2	0.03	13	0/26	*
	ACENAPHTEENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	ACENAPHTHYLENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	ANTHRACENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	BENZO(A)ANTHRACENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	BENZO(A)PYRENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	BENZO(B)FLUORANTHENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	BENZO(G,H,I)PERYLENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	BENZO(K)FLUORANTHENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-5-B

Statistical Summary of Surface Water Results

North Otter Sluice

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Value
SEMIVOLATILES	BIS(2-CHLOROETHOXY)METHANE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	BIS(2-CHLOROETHYL)ETHER	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	2	12	3	10	2	2	68	0.4	2	5	3	0/26	*
	BUTYLBENZYLPHTHALATE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	CARBAZOLE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	CHRYSENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	DI-N-BUTYLPHTHALATE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	DI-N-OCTYLPHTHALATE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	DIBENZ(A,H)ANTHRACENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	DIBENZOFURAN	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	DIETHYLPHTHALATE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	DIMETHYLPHTHALATE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	FLUORANTHENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	FLUORENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	HEXACHLOROBENZENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	HEXACHLOROBUTADIENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	HEXACHLOROCYCLOPENTADIENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	HEXACHLOROETHANE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	HIGH MOLECULAR PAHs	UG/L	50	50	50	0	50	50	1,300	0	0	0	50	0/26	*
	INDENO(1,2,3-CD)PYRENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	ISOPHORONE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	LOW MOLECULAR PAHs	UG/L	35	35	35	0	35	35	910	0	0	0	35	0/26	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	N-NITROSODIPHENYLAMINE (1)	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	NAPHTHALENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	NITROBENZENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	PENTACHLOROPHENOL	UG/L	13	13	13	0.5	13	13	330	0.03	0.2	0.03	13	0/26	0
	PHENANTHRENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	PHENOL	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	PYRENE	UG/L	5	5	5	0	5	5	130	0	0	0	5	0/26	*
	TOTAL PAHs	UG/L	85	85	85	0	85	85	2,200	0	0	0	85	0/26	0
TOTAL METALS	ALUMINUM	UG/L	205	37,700	2,250	37,500	785	37,700	60,700	1,370	7,110	50,600,000	4,580	27/27	27
	ANTIMONY	UG/L	0.50	4.0	1.3	3.5	1.2	1.2	34.4	0.15	0.78	0.61	1.5	1/27	*
	ARSENIC	UG/L	1.4	9.7	2.7	8.3	1.9	1.4	72.9	0.41	2.1	4.5	3.4	12/27	0
	BARIUM	UG/L	17.7	211	44.6	193	38.8	211	1,200	6.9	35.9	1,290	56.4	27/27	*
	BERYLLIUM	UG/L	0.010	0.25	0.064	0.24	0.050	0.050	1.7	0.0088	0.046	0.0021	0.079	0/27	*
	CADMIUM	UG/L	0.030	0.95	0.17	0.92	0.10	0.10	4.5	0.037	0.19	0.037	0.23	2/27	0
	CALCIUM	UG/L	11,200	62,300	34,700	51,100	38,400	62,300	936,000	2,820	14,600	214,000,000	39,500	27/27	*
	CHROMIUM	UG/L	0.85	102	6.1	101	2.1	0.90	164	3.7	19.2	370	12.4	18/27	1
	COBALT	UG/L	0.14	27.6	1.7	27.5	0.55	0.55	45.0	1.0	5.2	27.1	3.4	13/27	*
	COPPER	UG/L	1.6	82.0	8.4	80.5	5.5	8.3	228	2.9	15.0	224	13.4	20/27	19

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-5-B

Statistical Summary of Surface Water Results

North Otter Sluice

Analysis	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL METALS	IRON	UG/L	384	62,800	3,710	62,400	1,340	1,090	100,000	2,280	11,800	140,000,000	7,590	27/27	*
	LEAD	UG/L	0.24	57.3	3.7	57.1	0.75	0.95	99.8	2.2	11.4	130	7.4	4/27	2
	MAGNESIUM	UG/L	8,940	161,000	75,900	152,000	87,700	161,000	2,050,000	8,830	45,900	2,110,000,000	91,000	27/27	*
	MANGANESE	UG/L	28.8	691	129	662	103	105	3,480	29.1	151	22,800	178	27/27	*
	MERCURY	UG/L	0.050	0.66	0.083	0.61	0.050	0.050	2.2	0.023	0.12	0.014	0.12	1/26	1
	MOLYBDENUM	UG/L	0.34	4.2	1.2	3.9	0.65	0.45	32.3	0.19	0.98	0.95	1.5	12/27	*
	NICKEL	UG/L	1.7	118	8.3	116	4.4	1.7	225	4.2	22.0	485	15.6	16/27	2
	POTASSIUM	UG/L	3,150	49,100	23,800	46,000	27,300	32,900	642,000	2,580	13,400	180,000,000	28,200	27/27	*
	SELENIUM	UG/L	0.31	5.8	1.7	5.4	1.7	2.0	44.8	0.19	0.96	0.93	2.0	0/27	0
	SILVER	UG/L	0.13	1.3	0.40	1.1	0.35	0.35	10.7	0.045	0.24	0.056	0.48	0/27	0
	SODIUM	UG/L	44,000	1,340,000	574,000	1,300,000	672,000	1,340,000	15,500,000	69,400	361,000	.13000E+12	692,000	27/27	*
	THALLIUM	UG/L	0.65	4.8	1.4	4.1	1.0	0.95	38.3	0.17	0.91	0.82	1.7	1/27	*
	VANADIUM	UG/L	1.4	139	10.8	138	6.0	6.6	291	5.0	25.9	669	19.3	21/27	*
	ZINC	UG/L	2.7	346	29.3	343	12.3	2.8	791	12.5	65.2	4,250	50.7	8/27	3
VOLATILES	1,1,1-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	1,1,2,2-TETRACHLOROETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	1,1,2-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	1,1-DICHLORCETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	1,1-DICHLORCETHENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	1,2-DICHLORCETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	1,2-DICHLORCETHENE (TOTAL)	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	1,2-DICHLOROPROPANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	2-BUTANONE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	2-HEXANONE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	4-METHYL-2-PENTANONE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	ACETONE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	BENZENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	BROMODICHLOROMETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	BROMOFORM	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	BROMOMETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	CARBON DISULFIDE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	CARBON TETRACHLORIDE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	CHLOROBENZENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	CHLOROETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	CHLOROFORM	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	CHLOROMETHANE	UG/L	5	11	5	6	5	5	130	0.3	1	2	6	1/24	*
	CIS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	DIBROMOCHLOROMETHANE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	ETHYLBENZENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	METHYLENE CHLORIDE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	STYRENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/31/99

Table N-5-B

Statistical Summary of Surface Water Results

North Otter Sluice

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
VOLATILES	TETRACHLOROETHENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	TOLUENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	TRANS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	TRICHLOROETHENE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	VINYL CHLORIDE	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*
	XYLENE (TOTAL)	UG/L	5	5	5	0	5	5	120	0	0	0	5	0/24	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

Table N-6-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

South Otter Sluice Aquatic

Analysis	Analyte	Unit	Concentration											Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/KG	270	67,000	25,000	66,000	22,000	67,000	250,000	7,800	25,000	610,000,000	40,000	10/10	*	*	*	*
HEXAVALENT CHROMIUM	HEXAVALENT CHROMIUM	UG/KG	1.0	1.0	1.0	0	1.0	1.0	1.0	0	0	0	40,000	0/1	*	*	*	*
DIOXIN	1,2,3,4,6,7,8,9-OCDD	UG/KG	4	9	7	5	7	9	13	3	4	13	22	2/2	*	*	*	*
	1,2,3,4,6,7,8,9-OCDF	UG/KG	0.3	0.5	0.4	0.2	0.4	0.5	0.8	0.1	0.1	0.02	1	1/2	*	*	*	*
	1,2,3,4,6,7,8-HPCDD	UG/KG	0.4	2	1	2	1	2	2	0.8	1	1	6	1/2	*	*	*	*
	1,2,3,4,6,7,8-HPCDF	UG/KG	0.2	0.2	0.2	0.05	0.2	0.2	0.4	0.03	0.04	0.001	0.3	1/2	*	*	*	*
	1,2,3,4,7,8,9-HPCDF	UG/KG	0.2	0.2	0.2	0	0.2	0.2	0.4	0	0	0	0.2	0/2	*	*	*	*
	1,2,3,4,7,8-HXCDD	UG/KG	0.3	0.4	0.3	0.2	0.3	0.4	0.7	0.08	0.1	0.01	0.8	0/2	*	*	*	*
	1,2,3,4,7,8-HXCDF	UG/KG	0.1	0.1	0.1	0	0.1	0.1	0.2	0	0	0	0.1	0/2	*	*	*	*
	1,2,3,6,7,8-HXCDD	UG/KG	0.3	0.4	0.3	0.1	0.3	0.4	0.6	0.05	0.07	0.005	0.6	0/2	*	*	*	*
	1,2,3,6,7,8-HXCDF	UG/KG	0.1	0.1	0.1	0	0.1	0.1	0.2	0	0	0	0.1	0/2	*	*	*	*
	1,2,3,7,8,9-HXCDD	UG/KG	0.3	0.4	0.3	0.1	0.3	0.4	0.6	0.05	0.07	0.005	0.6	0/2	*	*	*	*
	1,2,3,7,8,9-HXCDF	UG/KG	0.1	0.2	0.1	0.05	0.1	0.2	0.3	0.03	0.04	0.001	0.3	0/2	*	*	*	*
	1,2,3,7,8-PECDD	UG/KG	0.4	0.5	0.4	0.1	0.4	0.5	0.8	0.05	0.07	0.005	0.7	0/2	*	*	*	*
	1,2,3,7,8-PECDF	UG/KG	0.1	0.2	0.1	0.05	0.1	0.2	0.3	0.03	0.04	0.001	0.3	0/2	*	*	*	*
	2,3,4,6,7,8-HXCDF	UG/KG	0.1	0.1	0.1	0	0.1	0.1	0.2	0	0	0	0.1	0/2	*	*	*	*
	2,3,4,7,8-PECDF	UG/KG	0.1	0.2	0.1	0.05	0.1	0.2	0.3	0.03	0.04	0.001	0.3	0/2	*	*	*	*
	2,3,7,8-TCDD	UG/KG	0.2	0.3	0.2	0.05	0.2	0.3	0.5	0.03	0.04	0.001	0.4	0/2	*	*	*	*
	2,3,7,8-TCDF	UG/KG	0.05	0.1	0.08	0.05	0.08	0.1	0.2	0.03	0.04	0.001	0.2	0/2	*	*	*	*
	TOTAL HPCDD	UG/KG	2	6	4	4	4	6	8	2	3	8	17	2/2	*	*	*	*
	TOTAL HPCDF	UG/KG	0.2	0.8	0.5	0.7	0.5	0.8	1	0.3	0.5	0.2	3	1/2	*	*	*	*
	TOTAL HXCDD	UG/KG	0.3	0.4	0.3	0.1	0.3	0.4	0.6	0.05	0.07	0.005	0.6	0/2	*	*	*	*
	TOTAL HXCDF	UG/KG	0.1	0.1	0.1	0	0.1	0.1	0.2	0	0	0	0.1	0/2	*	*	*	*
	TOTAL PECDD	UG/KG	0.4	0.5	0.4	0.1	0.4	0.5	0.8	0.05	0.07	0.005	0.7	0/2	*	*	*	*
	TOTAL PECDF	UG/KG	0.1	0.2	0.1	0.05	0.1	0.2	0.3	0.03	0.04	0.001	0.3	0/2	*	*	*	*
	TOTAL TCDD	UG/KG	7	13	10	6	10	13	20	3	4	18	29	2/2	*	*	*	*
	TOTAL TCDF	UG/KG	0.05	0.1	0.08	0.05	0.08	0.1	0.2	0.03	0.04	0.001	0.2	0/2	*	*	*	*
LOW LEVEL PESTICIDES AND PCBs	2,4'-DDD	UG/KG	0.06	0.4	0.2	0.4	0.1	0.2	2	0.04	0.1	0.02	0.2	1/10	*	*	*	*
	2,4'-DDE	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	2,4'-DDT	UG/KG	0.06	0.3	0.1	0.3	0.1	0.2	1	0.03	0.09	0.008	0.2	1/10	*	*	*	*
	4,4'-DDD	UG/KG	0.06	2	0.6	2	0.2	2	6	0.2	0.7	0.5	1	5/10	*	1	0	*
	4,4'-DDE	UG/KG	0.06	2	0.7	2	0.5	2	7	0.2	0.8	0.6	1	6/10	*	1	0	*
	4,4'-DDT	UG/KG	0.06	0.6	0.2	0.5	0.1	0.2	2	0.05	0.2	0.03	0.3	1/10	*	0	0	*
	ALDRIN	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	ALPHA-CHLORDANE	UG/KG	0.06	1	0.2	0.9	0.1	1	2	0.09	0.3	0.08	0.4	2/10	*	*	*	*
	DIELDRIN	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	0	0	0	*
	GAMMA-BHC (LINDANE)	UG/KG	0.06	1	0.3	1	0.1	0.06	3	0.1	0.4	0.1	0.5	2/10	*	*	*	*
	HEPTACHLOR	UG/KG	0.06	0.7	0.2	0.7	0.1	0.06	2	0.07	0.2	0.04	0.3	2/10	*	*	*	*
	HEPTACHLOR EPOXIDE	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	HEXACHLOROBENZENE	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	0	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-6-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

South Otter Sluice Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency			
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL PESTICIDES AND PCBs	MIREX	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-101 (2,2',3,5,5')	UG/KG	0.06	0.5	0.2	0.5	0.09	0.06	2	0.05	0.2	0.02	0.2	2/10	*	*	*	*
	PCB-105 (2,3,3',4,4')	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-118 (2,3',4,4',5)	UG/KG	0.06	1	0.2	0.9	0.09	0.06	2	0.09	0.3	0.08	0.4	2/10	*	*	*	*
	PCB-126 (3,3',4,4',5)	UG/KG	0.06	0.3	0.2	0.3	0.1	0.2	2	0.03	0.1	0.009	0.2	1/10	*	*	*	*
	PCB-128 (2,2',3,3',4,4')	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-138 (2,2',3,4,4',5')	UG/KG	0.06	1	0.4	1	0.09	0.06	4	0.1	0.4	0.2	0.6	3/10	*	*	*	*
	PCB-153 (2,2',4,4',5,5')	UG/KG	0.06	1	0.2	1	0.09	0.06	2	0.1	0.3	0.1	0.4	1/10	*	*	*	*
	PCB-170 (2,2',3,3',4,4',5)	UG/KG	0.06	0.7	0.2	0.7	0.09	0.06	2	0.07	0.2	0.04	0.3	1/10	*	*	*	*
	PCB-18 (2,2',5)	UG/KG	0.06	0.3	0.2	0.3	0.09	0.06	2	0.04	0.1	0.01	0.2	2/10	*	*	*	*
	PCB-180 (2,2',3,4,4',5,5')	UG/KG	0.06	1	0.2	1	0.09	0.06	2	0.1	0.4	0.1	0.5	1/10	*	*	*	*
	PCB-187 (2,2',3,4',5,5',6)	UG/KG	0.06	0.6	0.2	0.6	0.1	0.06	2	0.07	0.2	0.04	0.3	2/10	*	*	*	*
	PCB-195 (2,2',3,3',4,4',5,6)	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-206 (2,2',3,3',4,4',5,5',	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-209 (2,2',3,3',4,4',5,5',6	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-28 (2,4,4')	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-44 (2,2',3,5')	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-52 (2,2',5,5')	UG/KG	0.06	1	0.3	1	0.09	0.2	3	0.1	0.4	0.2	0.5	2/10	*	*	*	*
	PCB-66 (2,3',4,4')	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-77 (3,3',4,4')	UG/KG	0.06	0.3	0.1	0.3	0.09	0.2	1	0.03	0.09	0.009	0.2	0/10	*	*	*	*
	PCB-8 (2,4')	UG/KG	0.06	1	0.3	1	0.1	0.2	3	0.1	0.3	0.1	0.4	3/10	*	*	*	*
	TOTAL DDTs	UG/KG	0.3	6	2	5	1	0.4	19	0.6	2	3	3	5/10	0	4	0	*
	TOTAL PCBs	UG/KG	1	9	4	8	2	1	36	0.9	3	9	5	5/10	0	0	0	*
	TRANS-NONACHLOR	UG/KG	0.06	0.9	0.3	0.9	0.2	0.9	3	0.08	0.3	0.06	0.4	3/10	*	*	*	*
SULFIDE	SULFIDE	MG/KG	6	4,800	1,100	4,800	89	4,800	11,000	540	1,700	2,900,000	2,100	6/10	*	*	*	*
LOW LEVEL SEMIVOLATILES	1,1'-BIPHENYL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	1,2,4-TRICHLOROBENZENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	1,2-DICHLOROBENZENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	1,3-DICHLOROBENZENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	1,4-DICHLOROBENZENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	1-METHYLNAPHTHALENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	*	*	*
	1-METHYLPHENANTHRENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	*	*	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2,3,5-TRIMETHYLNAPHTHALENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	*	*	*
	2,4,5-TRICHLOROPHENOL	UG/KG	48	2,700	520	2,600	210	2,700	5,200	250	790	620,000	980	0/10	*	*	*	*
	2,4,6-TRICHLOROPHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2,4-DICHLOROPHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2,4-DIMETHYLPHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2,4-DINITROPHENOL	UG/KG	48	2,700	550	2,600	210	2,700	5,000	280	830	690,000	1,100	0/9	*	*	*	*
	2,4-DINITROTOLUENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2,6-DIMETHYLNAPHTHALENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	98,000	390	1/10	0	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-6-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

South Otter Sluice Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	2,6-DINITROTOLUENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2-CHLORONAPHTHALENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2-CHLOROPHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2-METHYLNAPHTHALENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	0	0	*
	2-METHYLPHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	2-NITROANILINE	UG/KG	48	2,700	520	2,600	210	2,700	5,200	250	790	630,000	980	0/10	*	*	*	*
	2-NITROPHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	3,3'-DICHLOROBENZIDINE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	3-NITROANILINE	UG/KG	48	2,700	520	2,600	210	2,700	5,200	250	790	630,000	980	0/10	*	*	*	*
	4,6-DINITRO-2-METHYLPHENOL	UG/KG	48	2,700	520	2,600	210	2,700	5,200	250	790	630,000	980	0/10	*	*	*	*
	4-BROMOPHENYL-PHENYLETHER	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	4-CHLORO-3-METHYLPHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	4-CHLOROANILINE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	4-CHLOROPHENYL-PHENYLETHER	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	4-METHYLPHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	4-NITROANILINE	UG/KG	48	2,700	520	2,600	210	2,700	5,200	250	790	630,000	980	0/10	*	*	*	*
	4-NITROPHENOL	UG/KG	48	2,700	520	2,600	210	2,700	5,200	250	790	630,000	980	0/10	*	*	*	*
	ACENAPHTHENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	0	0	*
	ACENAPHTHYLENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	0	0	*
	ANTHRACENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	0	0	*
	BENZO(A)ANTHRACENE	UG/KG	19	1,100	200	1,000	80	1,100	2,000	100	320	100,000	390	1/10	0	0	0	*
	BENZO(A)PYRENE	UG/KG	20	330	120	310	80	20	1,200	38	120	14,000	190	3/10	0	0	0	*
	BENZO(B)FLUORANTHENE	UG/KG	21	330	130	310	80	330	1,300	39	120	15,000	200	3/10	0	*	*	*
	BENZO(E)PYRENE	UG/KG	21	330	120	310	80	330	1,200	36	120	13,000	190	3/10	0	*	*	*
	BENZO(G,H,I)PERYLENE	UG/KG	19	330	120	310	80	330	1,200	36	110	13,000	190	2/10	0	*	*	*
	BENZO(K)FLUORANTHENE	UG/KG	20	330	130	310	80	330	1,300	39	120	15,000	200	3/10	0	*	*	*
	BENZOIC ACID	UG/KG	48	2,700	570	2,600	260	2,700	5,700	260	810	650,000	1,900	1/10	*	*	*	*
	BENZYL ALCOHOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	BIS(2-CHLOROETHOXY)METHANE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	BIS(2-CHLOROETHYL)ETHER	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	BUTYLBENZYLPHTHALATE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	CARBAZOLE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	CHRYSENE	UG/KG	21	360	130	340	80	360	1,300	42	130	18,000	210	3/10	0	0	0	*
	DI-N-BUTYLPHTHALATE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	DI-N-OCTYLPHTHALATE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	DIBENZ(A,H)ANTHRACENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	0	0	*
	DIBENZOFURAN	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	DIBENZOTHIOPHENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	DIETHYLPHTHALATE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	DIMETHYLPHTHALATE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-6-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

South Otter Sluice Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
LOW LEVEL SEMIVOLATILES	FLUORANTHENE	UG/KG	21	430	150	410	88	430	1,500	44	140	20,000	230	4/10	0	0	0	*
	FLUORENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	0	0	*
	HEXACHLOROBENZENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	0	*	*
	HEXACHLOROBUTADIENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	HEXACHLOROCYCLOPENTADIENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	HEXACHLOROETHANE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	HIGH MOLECULAR PAHs	UG/KG	250	6,800	1,900	6,600	960	6,800	19,000	680	2,200	4,600,000	3,100	4/10	*	*	*	*
	INDENO(1,2,3-CD)PYRENE	UG/KG	19	1,100	200	1,000	80	1,100	2,000	100	320	100,000	390	1/10	0	*	*	*
	ISOPHORONE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	LOW MOLECULAR PAHs	UG/KG	190	11,000	2,100	10,000	830	11,000	21,000	990	3,100	9,900,000	3,900	1/10	*	*	*	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	N-NITROSODIPHENYLAMINE (1)	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	NAPETHALENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	0	0	*
	NITROBENZENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	*	*	*	*
	PENTACHLOROPHENOL	UG/KG	48	2,700	520	2,600	210	2,700	5,200	250	790	630,000	980	0/10	*	*	*	*
	PERYLENE	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	0/10	0	*	*	*
	PHENANTHRENE	UG/KG	21	1,100	210	1,000	83	1,100	2,100	99	310	99,000	390	1/10	0	0	0	*
	PHENOL	UG/KG	19	1,100	210	1,000	83	1,100	2,100	99	310	99,000	350	0/10	*	*	*	*
	PYRENE	UG/KG	21	480	150	460	80	480	1,500	49	150	24,000	240	4/10	0	0	0	*
	TOTAL PAHs	UG/KG	450	28,000	5,100	27,000	2,000	28,000	51,000	2,600	8,300	69,000,000	9,900	4/10	0	1	0	*
TOTAL METALS	ALUMINUM	MG/KG	5,130	42,700	22,300	37,600	21,600	42,700	379,000	2,120	8,740	76,400,000	26,000	17/17	*	*	*	5
	ANTIMONY	MG/KG	0.26	2.9	1.4	2.6	1.1	0.95	24.5	0.20	0.84	0.71	1.8	10/17	*	6	0	4
	ARSENIC	MG/KG	1.3	24.8	11.3	23.5	9.8	24.8	192	1.6	6.6	43.3	14.1	17/17	5	11	0	0
	BARIUM	MG/KG	37.0	353	150	316	107	353	2,540	23.9	98.6	9,720	191	17/17	*	*	*	0
	BERYLLIUM	MG/KG	0.010	0.84	0.32	0.83	0.28	0.010	5.5	0.074	0.31	0.094	0.45	11/17	*	*	*	10
	CADMIUM	MG/KG	0.020	4.2	0.76	4.2	0.25	0.025	13.0	0.31	1.3	1.6	1.3	9/17	8	2	0	2
	CALCIUM	MG/KG	2,090	14,200	8,020	12,100	7,240	14,200	136,000	897	3,700	13,700,000	9,590	17/17	*	*	*	*
	CHROMIUM	MG/KG	21.6	122	51.8	100	50.3	122	881	6.4	26.6	706	53.0	17/17	1	2	0	1
	COBALT	MG/KG	2.4	39.3	19.8	36.9	16.6	28.4	336	2.2	9.2	85.4	23.7	17/17	*	*	*	1
	COPPER	MG/KG	16.7	105	61.4	88.3	58.1	105	1,040	7.4	30.5	928	74.3	17/17	8	11	0	6
	IRON	MG/KG	3,570	73,300	39,800	69,700	40,600	73,300	676,000	4,530	18,700	349,000,000	47,700	17/17	*	*	*	*
	LEAD	MG/KG	5.4	99.5	37.3	94.1	27.5	99.5	634	7.9	32.4	1,050	81.0	17/17	7	6	0	1
	MAGNESIUM	MG/KG	6,400	22,400	12,100	16,000	11,400	14,000	206,000	1,050	4,350	18,900,000	14,000	17/17	*	*	*	*
	MANGANESE	MG/KG	55.3	1,270	582	1,210	577	1,270	9,900	63.8	263	69,200	694	17/17	*	*	*	0
	MERCURY	MG/KG	0.030	18.5	1.9	18.5	0.22	0.22	32.3	1.2	4.9	23.9	4.0	16/17	4	11	3	6
	MOLYBDENUM	MG/KG	0.10	5.2	1.8	5.1	1.4	5.2	30.3	0.44	1.8	3.3	2.5	10/17	*	*	*	0
	NICKEL	MG/KG	23.6	123	64.2	99.4	68.2	123	1,090	7.4	30.5	933	77.1	17/17	1	17	11	1
	POTASSIUM	MG/KG	887	6,520	3,600	5,630	3,490	6,520	61,200	387	1,590	2,540,000	4,280	17/17	*	*	*	*
	SELENIUM	MG/KG	0.28	3.5	0.88	3.2	0.80	1.1	14.9	0.19	0.78	0.60	1.2	1/17	1	1	1	*
	SILVER	MG/KG	0.065	0.47	0.24	0.40	0.19	0.19	4.0	0.034	0.14	0.020	0.30	0/17	0	0	0	*
	SODIUM	MG/KG	1,550	23,400	6,000	21,900	5,270	23,400	102,000	1,210	5,000	25,000,000	8,110	17/17	*	*	*	*

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

06/01/99

Table N-6-A

Statistical Summary of Soil and Sediment Bulk Chemistry Results

South Otter Sluice Aquatic

Analysis	Analyte	Unit	Concentration										Detection Frequency				
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=SF Bay Ambient	>=ERL	>=ERM	>=Ambient
TOTAL METALS	THALLIUM	MG/KG	0.040	1.0	0.30	0.96	0.23	0.045	5.0	0.064	0.26	0.070	0.41	0/17	*	*	*	0
	VANADIUM	MG/KG	41.4	139	87.0	97.6	83.9	109	1,480	7.4	30.4	923	99.9	17/17	*	*	*	6
	ZINC	MG/KG	48.3	605	217	557	166	605	3,680	41.5	171	29,200	289	17/17	10	11	2	5

ERL = Effects Range - Low ERM = Effects Range - Median UG/KG = Micrograms per kilogram MG/KG = Milligrams per kilogram NA = Not Analyzed

Ambient values are in milligrams per kilogram (MG/KG).

SF Bay ambient, ERL, and ERM values for inorganic analytes are in milligrams per kilogram (MG/KG). SF Bay ambient, ERL, and ERM values for organic analytes are in micrograms per kilogram (UG/KG).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Effects range median (ERM) guideline values (Long et. al. 1995).

Effects range low (ERM) guideline values (Long et. al. 1995).

* Screening values not available.

Table N-6-B

Statistical Summary of Surface Water Results

South Otter Sluice

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL ORGANIC CARBON	TOTAL ORGANIC CARBON	MG/L	3	12	7	9	7	7	110	0.6	2	5	8	16/16	*
EXPLOSIVES	1,3,5-TRINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	1,3-DINITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	2,4,6-TRINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	2,4-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	2,6-DINITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	2-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	3-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	4-NITROTOLUENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	HMX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	NITROBENZENE	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	RDX	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	1	0.002	0.007	0	0.06	0/16	*
	TETRYL	UG/L	0.05	0.07	0.06	0.02	0.07	0.07	0.8	0.002	0.007	0	0.06	0/13	*
LOW LEVEL PESTICIDES AND PCBs	4,4'-DDD	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	*
	4,4'-DDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	*
	4,4'-DDT	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	0
	ALDRIN	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.05	0	0	0	0.03	0/2	0
	ALPHA-BHC	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.05	0	0	0	0.03	0/2	*
	ALPHA-CHLORDANE	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.05	0	0	0	0.03	0/2	*
	AROCLOR-1016	UG/L	0.3	0.3	0.3	0	0.3	0.3	0.5	0	0	0	0.3	0/2	0
	AROCLOR-1221	UG/L	0.5	0.5	0.5	0	0.5	0.5	1	0	0	0	0.5	0/2	0
	AROCLOR-1232	UG/L	0.3	0.3	0.3	0	0.3	0.3	0.5	0	0	0	0.3	0/2	0
	AROCLOR-1242	UG/L	0.3	0.3	0.3	0	0.3	0.3	0.5	0	0	0	0.3	0/2	0
	AROCLOR-1248	UG/L	0.3	0.3	0.3	0	0.3	0.3	0.5	0	0	0	0.3	0/2	0
	AROCLOR-1254	UG/L	0.3	0.3	0.3	0	0.3	0.3	0.5	0	0	0	0.3	0/2	0
	AROCLOR-1260	UG/L	0.3	0.3	0.3	0	0.3	0.3	0.5	0	0	0	0.3	0/2	0
	BETA-BHC	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.05	0	0	0	0.03	0/2	*
	DELTA-BHC	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.05	0	0	0	0.03	0/2	*
	DIELDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	0
	ENDOSULFAN I	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.05	0	0	0	0.03	0/2	0
	ENDOSULFAN II	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	0
	ENDOSULFAN SULFATE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	*
	ENDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	0
	ENDRIN ALDEHYDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	*
	ENDRIN KETONE	UG/L	0.05	0.05	0.05	0	0.05	0.05	0.1	0	0	0	0.05	0/2	*
	GAMMA-BHC (LINDANE)	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.05	0	0	0	0.03	0/2	0
	GAMMA-CHLORDANE	UG/L	0.03	0.03	0.03	0	0.03	0.03	0.05	0	0	0	0.03	0/2	*
	HEPTACHLOR	UG/L	0.005	0.005	0.005	0	0.005	0.005	0.01	0	0	0	0.005	0/2	0
	HEPTACHLOR EPOXIDE	UG/L	0.005	0.005	0.005	0	0.005	0.005	0.01	0	0	0	0.005	0/2	0
	METHOXYCHLOR	UG/L	0.3	0.3	0.3	0	0.3	0.3	0.5	0	0	0	0.3	0/2	0
	TOTAL DDTs	UG/L	0.2	0.2	0.2	0	0.2	0.2	0.3	0	0	0	0.2	0/2	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-6-B

Statistical Summary of Surface Water Results

South Otter Sluice

Analysis	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95)	Total	>=SSA Guidance Values
LOW LEVEL PESTICIDES AND PCBs	TOTAL PCBs	UG/L	2	2	2	0	2	2	4	0	0	0	2	0/2	*
	TOXAPHENE	UG/L	2	2	2	0	2	2	3	0	0	0	2	0/2	*
PESTICIDES AND PCBs	4,4'-DDD	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	*
	4,4'-DDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	*
	4,4'-DDT	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	0
	ALDRIN	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.5	0.00006	0.0003	0	0.03	0/20	0
	ALPHA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.5	0.00006	0.0003	0	0.03	0/20	*
	ALPHA-CHLORDANE	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.5	0.00005	0.0003	0	0.03	0/20	*
	AROCLOR-1016	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	5	0.0006	0.003	0	0.3	0/20	0
	AROCLOR-1221	UG/L	0.3	0.5	0.3	0.3	0.3	0.3	6	0.02	0.1	0.01	0.3	0/20	0
	AROCLOR-1232	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	5	0.0006	0.003	0	0.3	0/20	0
	AROCLOR-1242	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	5	0.0006	0.003	0	0.3	0/20	0
	AROCLOR-1248	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	5	0.0006	0.003	0	0.3	0/20	0
	AROCLOR-1254	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	5	0.0006	0.003	0	0.3	0/20	0
	AROCLOR-1260	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	5	0.0006	0.003	0	0.3	0/20	0
	BETA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.5	0.00006	0.0003	0	0.03	0/20	*
	DELTA-BHC	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.5	0.00006	0.0003	0	0.03	0/20	*
	DIELDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	0
	ENDOSULFAN I	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.5	0.00006	0.0003	0	0.03	0/20	0
	ENDOSULFAN II	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	0
	ENDOSULFAN SULFATE	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	*
	ENDRIN	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	0
	ENDRIN ALDEHYDE	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	*
	ENDRIN KETONE	UG/L	0.05	0.05	0.05	0	0.05	0.05	1	0	0	0	0.05	0/20	*
	GAMMA-BHC (LINDANE)	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.5	0.00006	0.0003	0	0.03	0/20	0
	GAMMA-CHLORDANE	UG/L	0.03	0.03	0.03	0.001	0.03	0.03	0.5	0.00005	0.0003	0	0.03	0/20	*
	HEPTACHLOR	UG/L	0.005	0.03	0.02	0.02	0.03	0.03	0.4	0.002	0.008	0.00006	0.02	0/20	0
	HEPTACHLOR EPOXIDE	UG/L	0.005	0.005	0.005	0	0.005	0.005	0.1	0	0	0	0.005	0/20	0
	METHOXYCHLOR	UG/L	0.3	0.3	0.3	0.01	0.3	0.3	5	0.0006	0.003	0	0.3	0/20	0
	TOTAL DDTs	UG/L	0.2	0.2	0.2	0	0.2	0.2	3	0	0	0	0.2	0/20	*
	TOTAL PCBs	UG/L	2	2	2	0.3	2	2	36	0.02	0.1	0.01	2	0/20	*
	TOXAPHENE	UG/L	2	2	2	0.05	2	2	30	0.004	0.02	0.0003	2	0/20	*
TOTAL SUSPENDED SOLIDS	TOTAL SUSPENDED SOLIDS	MG/L	5	54	26	49	26	30	420	3	12	140	31	15/16	*
SULFIDE	SULFIDE	MG/L	0.05	0.05	0.05	0	0.05	0.05	0.05	0	0	0	31	0/1	*
SEMIVOLATILES	1,2,4-TRICHLOROBENZENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	1,2-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	55	0	0	0	3	0/22	*
	1,3-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	55	0	0	0	3	0/22	*
	1,4-DICHLOROBENZENE	UG/L	3	3	3	0	3	3	55	0	0	0	3	0/22	*
	2,2'-OXYBIS(1-CHLOROPROPANE)	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-6-B

Statistical Summary of Surface Water Results

South Otter Sluice

Analyte	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	Equal Or Above Value
SEMIVOLATILES	2,4,5-TRICHLOROPHENOL	UG/L	13	13	13	0.5	13	13	280	0.05	0.2	0.05	13	0/22	*
	2,4,6-TRICHLOROPHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2,4-DICHLOROPHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2,4-DIMETHYLPHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2,4-DINITROPHENOL	UG/L	13	13	13	0.5	13	13	280	0.05	0.2	0.05	13	0/22	*
	2,4-DINITROTOLUENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2,6-DINITROTOLUENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2-CHLORONAPHTHALENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2-CHLOROPHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2-METHYLNAPHTHALENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2-METHYLPHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	2-NITROANILINE	UG/L	13	13	13	0.5	13	13	280	0.05	0.2	0.05	13	0/22	*
	2-NITROPHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	3,3'-DICHLOROBENZIDINE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	3-NITROANILINE	UG/L	13	13	13	0.5	13	13	280	0.05	0.2	0.05	13	0/22	*
	4,6-DINITRO-2-METHYLPHENOL	UG/L	13	13	13	0.5	13	13	280	0.05	0.2	0.05	13	0/22	*
	4-BROMOPHENYL-PHENYLETHER	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	4-CHLORO-3-METHYLPHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	4-CHLOROANILINE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	4-CHLOROPHENYL-PHENYLETHER	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	4-METHYLPHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	4-NITROANILINE	UG/L	13	13	13	0.5	13	13	280	0.05	0.2	0.05	13	0/22	*
	4-NITROPHENOL	UG/L	13	13	13	0.5	13	13	280	0.05	0.2	0.05	13	0/22	*
	ACENAPHTHENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	ACENAPHTHYLENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	ANTHRACENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	BENZO(A)ANTHRACENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	BENZO(A)PYRENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	BENZO(B)FLUORANTHENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	BENZO(G,H,I)PERYLENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	BENZO(K)FLUORANTHENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	BIS(2-CHLOROETHOXY)METHANE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	BIS(2-CHLOROETHYL)ETHER	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	2	29	3	27	2	2	76	1	6	33	6	1/22	*
	BUTYLBENZYLPHTHALATE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	CARBAZOLE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	CHRYSENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	DI-N-BUTYLPHTHALATE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	DI-N-OCTYLPHTHALATE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	DIBENZ(A,H)ANTHRACENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	DIBENZOFURAN	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-6-B

Statistical Summary of Surface Water Results

South Otter Sluice

Analysis	Analyte	Unit	Concentration										Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guideline Values
SEMIVOLATILES	DIETHYLPHTHALATE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	DIMETHYLPHTHALATE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	FLUORANTHENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	FLUORENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	HEXACHLOROBENZENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	HEXACHLOROBUTADIENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	HEXACHLOROCYCLOPENTADIENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	HEXACHLOROETHANE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	HIGH MOLECULAR PAHs	UG/L	50	50	50	0	50	50	1,100	0	0	0	50	0/22	*
	INDENO(1,2,3-CD)PYRENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	ISOPHORONE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	LOW MOLECULAR PAHs	UG/L	35	35	35	0	35	35	770	0	0	0	35	0/22	*
	N-NITROSO-DI-N-PROPYLAMINE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	N-NITROSODIPHENYLAMINE (1)	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	NAPHTHALENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	NITROBENZENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	PENTACHLOROPHENOL	UG/L	13	13	13	0.5	13	13	280	0.05	0.2	0.05	13	0/22	0
	PHENANTHRENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	PHENOL	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	PYRENE	UG/L	5	5	5	0	5	5	110	0	0	0	5	0/22	*
	TOTAL PAHs	UG/L	85	85	85	0	85	85	1,900	0	0	0	85	0/22	0
TOTAL METALS	ALUMINUM	UG/L	167	2,100	844	1,930	802	1,260	18,600	104	487	237,000	1,020	22/22	22
	ANTIMONY	UG/L	0.50	1.9	1.1	1.4	1.1	1.5	23.9	0.088	0.41	0.17	1.2	0/22	*
	ARSENIC	UG/L	1.4	4.4	2.2	3.0	2.1	1.4	49.4	0.19	0.88	0.77	2.6	10/22	0
	BARIUM	UG/L	19.4	1,160	94.7	1,140	47.9	1,160	2,080	50.9	239	56,900	182	22/22	*
	BERYLLIUM	UG/L	0.010	0.20	0.066	0.19	0.050	0.050	1.5	0.011	0.052	0.0027	0.085	0/22	*
	CADMIUM	UG/L	0.030	0.52	0.15	0.49	0.10	0.10	3.5	0.030	0.14	0.020	0.21	3/22	0
	CALCIUM	UG/L	11,400	58,200	34,100	46,800	40,400	12,500	750,000	3,340	15,700	246,000,000	39,900	22/22	*
	CHROMIUM	UG/L	0.63	6.1	2.4	5.5	1.9	0.90	52.3	0.35	1.6	2.7	3.0	13/22	0
	COBALT	UG/L	0.14	1.4	0.67	1.3	0.58	0.55	14.8	0.079	0.37	0.14	0.81	10/22	*
	COPPER	UG/L	1.8	7.8	4.5	6.1	4.3	3.1	98.7	0.40	1.9	3.5	5.2	16/22	13
	IRON	UG/L	396	3,300	1,660	2,900	1,600	3,300	36,500	167	785	617,000	1,950	22/22	*
	LEAD	UG/L	0.18	3.1	0.90	2.9	0.75	0.75	19.7	0.13	0.61	0.38	1.1	3/22	1
	MAGNESIUM	UG/L	9,470	154,000	72,500	145,000	73,000	154,000	1,600,000	10,200	47,900	2,300,000,000	90,100	22/22	*
	MANGANESE	UG/L	37.9	278	143	240	152	278	3,140	16.5	77.2	5,960	171	22/22	*
	MERCURY	UG/L	0.050	0.24	0.065	0.19	0.050	0.050	1.4	0.0091	0.043	0.0018	0.081	1/22	1
	MOLYBDENUM	UG/L	0.15	1.9	0.76	1.8	0.63	1.1	16.8	0.090	0.42	0.18	0.92	6/22	*
	NICKEL	UG/L	1.7	7.6	4.2	6.0	4.5	1.7	91.8	0.40	1.9	3.6	4.9	17/22	0
	POTASSIUM	UG/L	3,260	45,000	23,200	41,700	29,400	45,000	511,000	3,040	14,200	203,000,000	28,400	22/22	*
	SELENIUM	UG/L	0.31	2.5	1.5	2.1	1.7	2.0	34.0	0.12	0.54	0.29	1.7	3/22	0
	SILVER	UG/L	0.13	0.75	0.37	0.62	0.30	0.35	8.1	0.043	0.20	0.040	0.44	0/22	0

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

06/01/99

Table N-6-B

Statistical Summary of Surface Water Results

South Otter Sluice

Analysis	Analyte	Unit	Concentration											Detection Frequency	
			Minimum	Maximum	Average	Range	Median	Mode	Sum	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)	Total	>=QEA Guidance Values
TOTAL METALS	SODIUM	UG/L	47,600	1,240,000	569,000	1,190,000	598,000	807,000	12,500,000	82,800	388,000	.15100E+12	710,000	22/22	*
	THALLIUM	UG/L	0.65	2.4	1.2	1.8	0.95	0.95	27.3	0.12	0.56	0.32	1.4	2/22	*
	VANADIUM	UG/L	1.2	11.3	5.8	10.1	5.5	5.4	127	0.58	2.7	7.4	6.8	18/22	*
	ZINC	UG/L	2.2	430	39.3	428	15.7	430	864	19.0	88.9	7,910	71.9	9/22	2
VOLATILES	1,1,1-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	1,1,2,2-TETRACHLOROETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	1,1,2-TRICHLOROETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	1,1-DICHLOROETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	1,1-DICHLOROETHENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	1,2-DICHLOROETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	1,2-DICHLOROETHENE (TOTAL)	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	1,2-DICHLOROPROPANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	2-BUTANONE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	2-HEXANONE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	4-METHYL-2-PENTANONE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	ACETONE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	BENZENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	BROMODICHLOROMETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	BROMOFORM	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	BROMOMETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	CARBON DISULFIDE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	CARBON TETRACHLORIDE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	CHLOROBENZENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	CHLOROETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	CHLOROFORM	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	CHLOROMETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	CIS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	DIBROMOCHLOROMETHANE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	ETHYLBENZENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	METHYLENE CHLORIDE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	STYRENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	TETRACHLOROETHENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	TOLUENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	TRANS-1,3-DICHLOROPROPENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	TRICHLOROETHENE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	VINYL CHLORIDE	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*
	XYLENE (TOTAL)	UG/L	5	5	5	0	5	5	80	0	0	0	5	0/16	*

UG/L = Micrograms per liter MG/L = Milligrams per liter NA = Not Analyzed

QEA Guidance values are in micrograms per liter (UG/L).

All statistical values were calculated using the detected values and ½ of the detection limits for non-detects.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

* Screening values not available.

APPENDIX O

SMALL MAMMAL TRAPPING AND CALIFORNIA BLACK RAIL SURVEYS

H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

CALIFORNIA BLACK RAIL SURVEYS AT THE WEAPONS STATION SEAL BEACH DETACHMENT CONCORD OTTER SLUICE: SUMMER 1998

by

H.T. HARVEY AND ASSOCIATES

Scott B. Terrill, Project Principal
Colleen Lenihan, Field Ornithologist
Penelope Delevoryas, Field Ornithologist
Stephen Rottenborn, Field Ornithologist
Larry Spear, Data Analyst

Prepared for

June Mire, Project Manager
Tetra Tech EM, Inc.
1304 Rose Garden Drive
Metairie, LA 70005

29 December 1998

Project No. 1428-01

☐ **Alviso Office**
906 Elizabeth Street • P.O. Box 1180
Alviso, CA 95002 • 408-263-1814 • Fax: 408-263-3823

☐ **Fresno Office**
423 West Fallbrook, Suite 206
Fresno, CA 93711 • 209-449-1423 • Fax: 209-449-8248

CALIFORNIA BLACK RAIL SURVEYS
AT THE WEAPONS STATION
SEAL BEACH DETACHMENT CONCORD
OTTER SLUICE: SUMMER 1998

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

INTRODUCTION 3

METHODS 4
Study area and survey design 4
Calculation of Black Rail abundance 7

RESULTS 10
Abundance of California Black Rails at WPNSTA Seal Beach Det Concord Otter Sluice Marsh during the breeding season of 1998 10
Detection probability of Black Rails in relation to environmental and logistical variables 11

DISCUSSION 13
LITERATURE CITED 15

EXECUTIVE SUMMARY

California Black Rails (*Laterallus jamaicensis coturniculus*) were surveyed using playback recordings at the Weapons Station Seal Beach Detachment (WPNSTA Seal Beach Det) Concord Otter Sluice area during the breeding season in June 1998. This report focuses on the results of those surveys.

A total of 14 detections of Black Rails (12 assumed males) were made. Our best (minimum) estimate of the density of male California Black Rails present at Otter Sluice during the breeding season of 1998 was 0.086 birds per hectare (= 10,000 m^2). Black Rails were detected only in a small portion of the survey area, along Transect 1 between the west end of Froid Road and the mouth of Otter Sluice. Most Black Rails (11 detections) were on the west side of Otter Sluice, while three detections were made on the east side of Otter Sluice, at the extreme southwest corner of Site 2. No rails were detected within Site 11 or elsewhere along Transect 2. The overall density (over both transects) was about six times lower than the Black Rail density recorded at the WPNSTA Seal Beach Det Concord Litigation Area in 1998. No Clapper Rail recordings were used, and no Clapper Rails were detected.

The low number of detections (total n = 14) of California Black Rails at the Otter Sluice area precluded analyses to examine the relationship between rail detection probability and variation in environmental and logistical variables.

The low apparent abundance of California Black Rails during the breeding season of 1998 at the Otter Sluice area probably reflects a combination of two factors. First, because it was necessary to position the survey route on roads north and east of Otter Sluice (i.e., across the Sluice from most of the suitable rail habitat), most of the area within 20-30 m of any given station was occupied by road edge and the Sluice itself, which were not suitable for rails. Therefore, it was necessary to estimate densities based on detections recorded at distances up to 60 m, where rails may have been less likely to respond to call playbacks compared to rails at shorter distances. A

second factor was the patchiness of rail habitat in the Otter Sluice area compared to the Litigation Area, which would be expected to result in lower densities.

In conclusion, California Black Rails did not appear to be abundant in the Otter Sluice area, primarily due to the patchiness of available rail habitat. However, the abundance of Black Rails in this area, relative to abundance recorded in the WPNSTA Seal Beach Det Concord Litigation Area, may not have been as low as indicated by the results of our surveys, due to negative bias inherent to the layout of the survey transects.

INTRODUCTION

During the breeding season of 1998, we used taped California Black Rail call-playbacks to conduct surveys at stations positioned along each of two survey transects near a tidal marsh located in the Otter Sluice area of the WPNSTA Seal Beach Det Concord on the south shore of Suisun Bay, California. Herein, we analyze these data to provide an assessment of the abundance of California Black Rails in the area.

METHODS

STUDY AREA AND SURVEY DESIGN

We conducted breeding-season surveys for California Black Rails near the tidal marsh in the Otter Sluice area at the WPNSTA Seal Beach Det Concord, Suisun Bay, California (Figs. 1, 2), on three days from June 2-4, 1998. The same methods were used to survey rails as were used at the WPNSTA Seal Beach Det Concord Litigation Area in May and June of 1998 (see H.T. Harvey & Associates 1998). Two routes were surveyed (Fig. 2); the first, with 17 stations at 50 m intervals, was 800 m in length; the second, with 18 stations, was 850 m. These routes ran along the north/east side of Otter Sluice. The potential Black Rail habitat along these routes was primarily to the south and west, on the opposite side of the Sluice from each station. Although the habitat within Sites 2 and 11 was initially considered to be of relatively low quality for the Black Rail, observers looked and listened for rails in all directions from each station (i.e., on both sides of the Sluice). At most stations, no Black Rails were detected in the 180° portion of the survey area within Sites 2 and 11, and at most of these stations, wetland habitat was sparsely distributed, of low quality or limited extent, or completely lacking on the north and/or east sides of the transect. Therefore, at most stations, only the 180° portion of the survey area containing potential rail habitat (south and west of Otter Sluice) was used to determine rail densities. However, the marsh to the east of stations 5-10 along Transect 1 (within Site 2; see Figs. 1, 2) was considered at least potentially suitable for Black Rails, and a few rails were detected in this area. Therefore, the complete 360° portion of the survey area on these six plots was used to determine rail densities.

Each of the 35 stations was marked with a flag and identified to route and station number. Three morning surveys and three evening surveys were conducted on each route. Each route was surveyed three times starting from the north end and three times starting from the south. Morning surveys were initiated no earlier than 0.5 hr before sunrise, and evening surveys extended no later than 1 hr following sunset. Except for wind speed (see below), it was not possible to control for the effects of other environmental variables (e.g., tide height, air,

Figures 1-2

These detailed station maps have been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.

temperature, cloud cover, and moon phase; see H.T. Harvey & Associates 1997a) affecting rail detection probability due to constraints imposed on the scheduling of rail surveys. Surveys were conducted using California Black Rail "kik-kik-kerr" calls (recorded at WPNSTA Seal Beach Det Concord in 1985) played from a Realistic cassette player (Model SCP-29) through a Realistic No. 4-1303 stereo-amplified speaker system. Following the 5-min period of broadcasts, observers remained on the station for five additional minutes and recorded any subsequent rail detections.

When a Black Rail was detected, data recorded included time, station number, type of call, compass bearing and estimated distance to the calling bird. Because these rails sometimes approached our broadcasting recorders, distance estimates pertain to the first call elicited by a rail. Simultaneous vocalizations and distances between call locations were used to distinguish individuals.

Weather conditions, including wind speed and direction, air temperature and cloud cover were recorded at the beginning and end of each survey. Surveys were not conducted when wind speeds exceeded 25 knots.

CALCULATION OF BLACK RAIL ABUNDANCE

Estimating abundance of rails from call playback surveys requires the determination of the maximum range within which rails are detected with equal probability (see Buckland et al. 1993). The expected number of detections would increase in proportion with πr^2, where r is the distance between the observer broadcasting the calls and the outer edge of the survey zone (i.e., the radius of the circular survey zone), and π is the constant, 3.1416. Conformance in the number of rail detections with this relationship as r is increased would indicate that rails were being detected at the greater distances as well as they were at shorter ones. However, a decrease in rail detections below that detected at shorter ranges would indicate that detection probability was negatively affected by the increase in r, either because the observer was hearing fewer of the responding rails, or if fewer rails responded.

During 1995 and 1996, the detection range cutoff (DC) at the WPNSTA Seal Beach Det Concord Litigation Area was determined to be 50 m (for rationale see H.T. Harvey & Associates 1997a); in 1998, DC was 60 m at the Litigation Area (see H.T. Harvey & Associates 1998). For this survey, density (d, = the number of rails per hectare) for Transect 2 was calculated from the equation

$$d = \frac{n}{(\pi \cdot DC^2 \cdot 6 \cdot 18 \text{ stations})\,(0.5) \,/\, (10{,}000)}$$

where n = number of detections within the range DC, $\pi = 3.1416$, 6 is the number of surveys per station, and 18 is the number of stations. The first part of the denominator ($\pi \cdot DC^2 \cdot 6 \cdot 18$ stations) was multiplied by 0.5 because only 180° of the 360° radius surveyed at each station along Transect 2 included wetlands habitat that was considered potentially suitable for Black Rails. Densities were divided by 10,000 to convert meters^2 to hectares.

Because six of the 17 stations along Transect 1 had potentially suitable Black Rail habitat on both sides, while the other 11 stations had suitable habitat on only one side, density for this transect was calculated from the equation

$$d = \frac{n}{[(\pi \cdot DC^2 \cdot 6)\,(11 \text{ stations} \cdot 0.5 + 6 \text{ stations})] \,/\, 10{,}000}.$$

Calculations of Black Rail breeding-season abundance are based on detections determined only from 'kik-kik-kerr' calls of the male (Reynard 1974, Repking 1975, Flores and Eddleman 1991, Eddleman et al. 1994, Legare 1996). Detections from 'gurr' and 'keurr' calls, used by both males and females, were excluded from these analyses. We did not attempt to estimate true abundance (i.e., the total number of different rails along the transects). However, excluding detections of females, which have different detection probability compared to males (Legare 1996), allowed us to estimate the relative abundance of the more predictable male component. California Black Rails are apparently monogamous (Flores and Eddleman 1993, Eddleman et al.

1994), and the sex ratio of 32 California Black Rails trapped at Mittry Lake, Arizona, was 1 : 1 (Eddleman et al. 1994). Therefore, abundance indices for the female component are most accurately, and probably most consistently, estimated by doubling the value obtained for male abundance. This was the procedure used to estimate abundance in this study.

RESULTS

ABUNDANCE OF CALIFORNIA BLACK RAILS AT WPNSTA SEAL BEACH DET CONCORD OTTER SLUICE MARSH DURING THE BREEDING SEASON OF 1998

A total of 14 detections of Black Rails were recorded during the 1998 breeding-season surveys at the WPNSTA Seal Beach Det Concord Otter Sluice area (Fig. 2). For the purposes of these analyses, a "detection" is defined as a record of a Black Rail on a particular survey of a particular station. Because the same Black Rail heard calling from two different stations represents two detections, the number of Black Rails actually heard during these surveys was less than 14. Black Rails were detected only in a small portion of the survey area, along Transect 1 between the west end of Froid Road and the mouth of Otter Sluice (Fig. 2). Most Black Rails (11 detections) were on the west side of Otter Sluice, while three detections were made on the east side of Otter Sluice, at the extreme southwest corner of Site 2. No rails were detected within Site 11 or elsewhere along Transect 2.

Of the 14 Black Rails detected, 12 gave the "kik-kik-ker" call (assumed males) and two used the "gurr" call (assumed females). Thus, calculation of rail density is based on the 12 detections of males (see Methods). Of the "kik-kik-ker" detections, only three were recorded as having been within the normal detection range cutoff (i.e., less than 50 m from the observer; Fig. 3) for an area where vegetation is of sparse to moderate density, such as in the Otter Sluice Area. All detections of Black Rails giving the "kik-kik-ker" call were at distances >30 m from the observers.

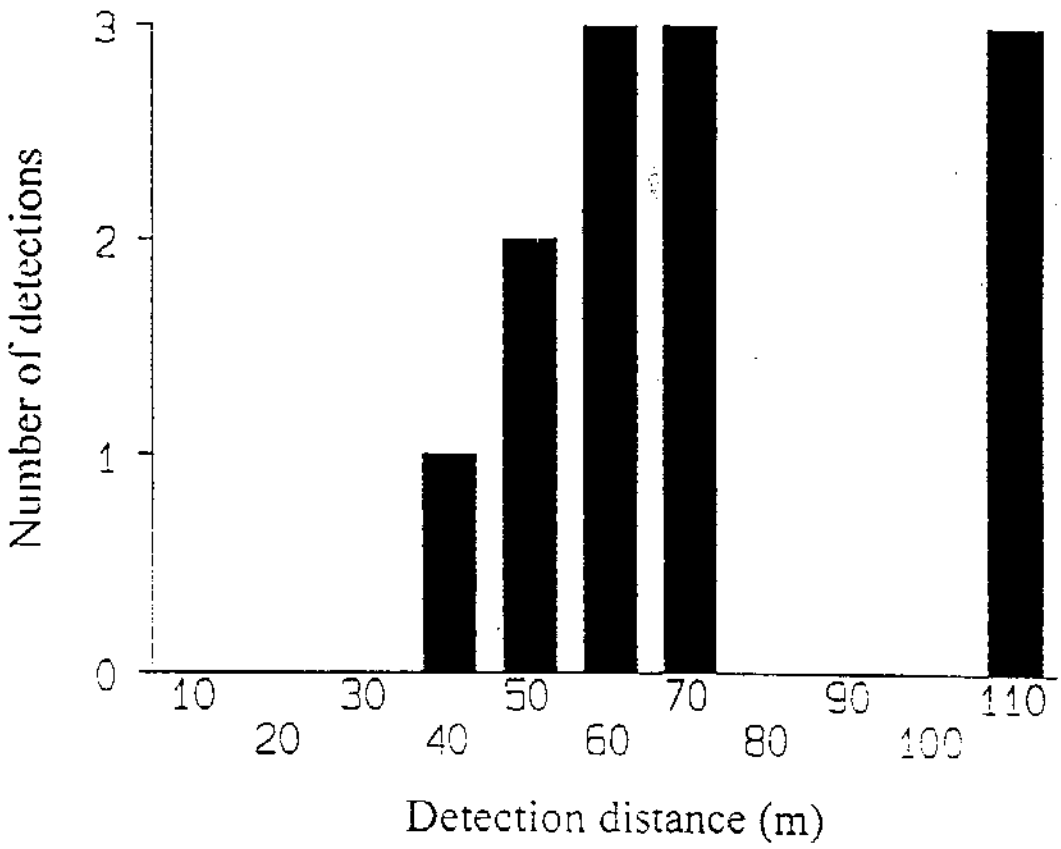
The overall density of male California Black Rails for the WPNSTA Seal Beach Det Concord Otter Sluice area in 1998 was 0.086 rails per hectare (Table 1). Assuming that each male was represented by a female (see above), the density would have been 0.172 birds per hectare. These are minimum estimates, because it is likely that less than 100% of the males responded on each survey (Legare 1996). Clapper Rails were neither heard, nor surveyed for (i.e., no Clapper Rail tapes were broacast).

Table 1. Density of male California Black Rails by route at the WPNSTA Seal Beach Det Concord Otter Sluice Area during the breeding seasons of 1998. Number of detections are the number of birds responding with the "kik-kik-kerr" call during the survey period. Area surveyed given as hectares; densities are given as birds per hectare (10,000 m^2). The area surveyed reflects a detection range cutoff of 60 m.

Route	Number of station surveys	Number of detections	Area surveyed	Density
Route 1	102	12	78.04	0.154
Route 2	108	0	61.07	0.00
Total	210	12	139.11	0.086

DETECTION PROBABILITY OF BLACK RAILS IN RELATION TO ENVIRONMENTAL AND LOGISTICAL VARIABLES

The number of Black Rail detections was not sufficient to allow a regression analysis relating detection probability to environmental and logistical variables.



Number of Black Rail detections at different distances from the observer during surveys at Otter Sluice

H.T. HARVEY & ASSOCIATES ECOLOGICAL CONSULTANTS			
Otter Sluice Black Rail Surveys: Rail Observations			
File No. 1428-01	Date 7/2/98	Figure 3	

DISCUSSION

Our best estimate of the density of male California Black Rails present at Otter Sluice during the breeding season of 1998 was 0.086 birds per hectare (= 10,000 m^2). Black Rails were detected only in a small portion of the survey area, along Transect 1 between the west end of Froid Road and the mouth of Otter Sluice (Fig. 2). Most Black Rails (11 detections) were on the west side of Otter Sluice, while three detections were made on the east side of Otter Sluice, at the extreme southwest corner of Site 2. Most of Site 2 was not covered by these surveys, and the distribution of Black Rails within Site 2 away from the extreme western edge of this area is unknown. No rails were detected within Site 11 or elsewhere along Transect 2. The overall density of males (0.086) was about six times lower than that recorded at the WPNSTA Seal Beach Det Concord Litigation Area in 1998; the density along Route 1 (0.154) was three times lower.

The low apparent abundance of California Black Rails during the breeding season of 1998 at the Otter Sluice Area probably reflects a combination of two factors. First, the absence of detections of male Black Rails at distances <30 m from the observer indicated that the routes were not placed randomly with respect to rail habitat within the area. Specifically, the routes were placed in such a manner that most stations were greater than 30 m from the nearest suitable rail habitat. This situation, in combination with the already low density of Black Rails in the area, may have resulted in negative bias in the density estimates because it was necessary to estimate Black Rail densities based on detections recorded at distances up to 60 m. In years prior to 1998, rails that were 60 m from the call playbacks in the Litigation Area were less likely to respond compared to rails at shorter distances (H. T. Harvey & Associates 1997a), although this did not appear to be the case in 1998 (H. T. Harvey & Associates 1998).

A second factor was the patchiness of rail habitat in the Otter Sluice Area compared to the Litigation area. Most of the wetlands along Transect 2 and those adjacent to the southern portion of Transect 1 consisted of cattail (*Typha angustifolia*) dominated marshes that, in many locations, had deeper water than is typical of occupied Black Rail habitat. Black Rails at Otter

Sluice were detected primarily in more heterogeneous vegetation that included peppergrass *(Lepidium latifolium)*, bulrushes (*Scirpus spp.*), and pickleweed (*Salicornia virginica*). Areas with Black Rail detections also had lower levels of standing water and were more similar to those areas where rails were found in the Litigation Area. With a greater proportion of area unsuitable for rails at Otter Sluice, densities here would be expected to be lower than in the Litigation Area.

In conclusion, California Black Rails did not appear to be abundant in the marshes along Otter Sluice due to the paucity of suitable habitat. Nevertheless, their densities, relative to densities recorded in the Litigation Area, may not have been as low as indicated by the results of our surveys, due to negative bias inherent to the layout of the survey route. Black Rails were apparently absent from Site 11, and the only area on the north/east side of Otter Sluice found to support Black Rails was in the extreme southwest corner of Site 2.

LITERATURE CITED

BUCKLAND, S. T., D. R. ANDERSON., K. P. BURNHAM, AND J. L. LAAKE. 1993. Distance Sampling. Chapman & Hall, New York.

EDDLEMAN, W.R., R.E. Flores, and M.L. Legare. 1994. Black Rail (*Laterallus jamaicensis*). *In* A. Poole and F. Gill [eds], The Birds of North America, No. 123. The Academy of Nat. Sci. Philadelphia; and The Amer. Ornithol. Union, Washington, D.C..

FLORES, R.E., AND W.R. EDDLEMAN. 1991. Ecology of the California Black Rail in southwestern Arizona. Final Rept., U.S. Bur. Reclam., Yuma Proj. Off., and Arizona Dept. Game and Fish. Yuma.

FLORES, R.E., AND W.R. EDDLEMAN. 1993. Nesting biology of the California Black Rail in southwestern Arizona. West. Birds 24: 81-88.

H. T. HARVEY & ASSOCIATES. 1997a. California Black Rails at NWS Concord: Standardized survey protocol and estimates of abundance. PRC Environmental Management, Inc.

H. T. HARVEY & ASSOCIATES. 1997b. California Black Rails Surveys at NWS Concord: Summer 1997. PRC Environmental Management, Inc.

H. T. HARVEY & ASSOCIATES. 1998. California Black Rails Surveys at NWS Concord: Summer 1998. PRC Environmental Management, Inc.

HURLBERT, S. H. 1984. Pseudoreplication and the design of ecological field experiments. Ecol. Monogr. 54: 187-211.

KLEINBAUM, D. G., L. L. KUPPER, AND K. E. MULLER. 1988. Applied regression analysis and other multivariable methods. PWS-KENT Publ. Co., Boston, Massachusetts.

LEGARE, M.L. 1996. The effectiveness of tape playbacks in estimating population densities of breeding Black Rails *Laterallus jamaicensis* in Florida. Unpubl. Ms Thesis. Univ. of Rhode Island, Kingston, RI

REPKING, C.F 1975. Distribution and habitat requirements of Black Rail (*Laterallus jamaicensis*) along the lower Colorado River. Unpubl. Ms Thesis. Arizona State University, Tempe.

REYNARD, G.B. 1974. Some vocalizations of the Black, Yellow, and Virginia Rails. Auk 91: 747-756.

SAS INSTITUTE, INC. 1985. *SAS* User's Guide: Statistics. 5th Edition. SAS Inst. Inc., Cary, North Carolina.

SEBER. G. A. F. 1977. Linear Regression Analysis. John Wiley & Sons, New York.

STATA CORP. 1995. *STATA* Reference Manual: Release 3.1. 6th Edition. Stata Corp., College Station, Texas.

Small-mammal Trapping Survey
Tidal Area Sites
Concord Naval Weapons Station
Draft Report

Prepared For

Tetra Tech EM Inc.
135 Main Street, Suite 1800
San Francisco, CA 94105

Prepared By

Ibis Environmental Services
1655 Mar West Street
Tiburon, California 94920

October 1998

1.0 Introduction

DRAFT

1.1 Project Description

A remedial investigation (RI) and qualitative ecological risk assessment (ERA) initiated by the Department of the Navy has indicated that several areas within Tidal Area Sites of Concord Naval Weapons Station, specifically R Area and Wood Hogger, contain low levels of metals and organic compounds (TtEMI 1998). A draft ERA for the Tidal Area Sites was submitted to the Navy and to regulatory agencies in April 1997. Based on comments received by regulatory agencies and the Navy's evaluation of progress in the field of risk assessment since the work for the ERA was prepared, the Navy proposed several additional field activities to fill data gaps.

Among additional field activities proposed were: 1) analyses of rodent tissues from Wood Hogger for metals, pesticides, and dioxins. 2) analyses of tissues of resident animals to calculate site-specific dose estimates of chemicals ingested by birds and mammals for comparison to toxicity reference values, and 3) a salt-marsh harvest mouse (SMHM) trapping study to attempt to document the presence of this state and federally listed endangered mammal. To fulfill these requirements, a trapping study was designed that would attempt to document SMHM presence and would also result in the collection of tissues from resident mice and/or voles at each site. Ibis Environmental Services was contracted to complete this trapping study. This report presents our methods and results.

1.2 Salt-marsh Harvest Mouse

The salt-marsh harvest mouse (*Reithrodontomys raviventris*) is a small cricetid rodent endemic to salt marshes in the San Francisco Bay Area (Fisler 1965). It is characterized by grooved upper incisors and the absence of external cheek pouches (Shellhammer 1982). Salt-marsh harvest mice occur primarily in areas where pickleweed (*Salicornia virginica*) is the dominant plant species, but may also occur in other types of saline marsh vegetation, as well as in uplands (Geissel et al. 1988, Shellhammer et al. 1982, 1989). The adaptation of salt-marsh harvest mice to the saline environment is shown most clearly by its ability to drink sea water and eat pickleweed (Fisler 1963). Habitat loss due to the loss of wetlands around San Francisco Bay is the most important contributor to its endangerment (Shellhammer 1989).

2.0 Project Site and Methods

DRAFT

2.1 Project Site

The project site is located at Tidal Area, Weapons Support Facility, Concord, California, also known as Concord Naval Weapons Station (NWS). Concord NWS is situated in the northern San Francisco Bay Area on Suisun Bay, Contra Costa County. The Tidal Area comprises four sites: Tidal Area Landfill (Site 1), R Area Disposal (Site 2), Froid and Taylor Roads (Site 9), and Wood Hogger (Site 11). Sites 2 and 11, R Area and Wood Hogger, were the focus of this study.

2.2 Methods

2.1.1 Salt-marsh Harvest Mouse Trapping

The trapping study had two objectives: 1) to attempt to document SMHM presence, and 2) to collect tissue samples from resident small mammals, preferably mammals captured near previously sampled locations where soil contaminant levels were known to be elevated.

We completed a total of 662 trap-nights (one trap-night equals one trap set for one night). Thirty Sherman live traps were set for five nights and 128 were set for an additional four nights between September 3 and September 8, 1998. Figures 1 and 2 show the placement of trap grids and transects. Traps were baited with a mixture of walnut meat and bird seed; each was supplied with cotton bedding material. Bait was replaced daily; bedding was replaced as necessary. Beginning on 3 September, traps were opened at dusk and checked at dawn the following day. Traps were closed from dawn to dusk every day.

We placed 119 traps in R Area and 39 in Wood Hogger. Traps in Wood Hogger were placed in three distinct areas: 15 were placed along Rhodes Road, 8 were placed in an area we called Flooded Pickleweed, and 16 were placed in an area we called Southwest Upland. Traps placed in flooded pickleweed were situated such that they were never submersed. Although habitat types at trap sites in R Area were not distinctly different, we differentiated trapped areas for ease of reference, as shown in Figure 3. Twenty-eight traps comprised the Grid; 20 comprised the West Line; 39 comprised the Mid Line; 21 comprised the Berm; and 11 comprised the East Line.

Captured mice were removed from the trap and identified to species. Salt-marsh harvest mice were measured and scored according to standard methods (Shellhammer 1984) and released at the trap site after an identifying mark was made with ink on the tail. We used a pre-printed data form to record data (see Appendix A).

Small-mammal trapping was conducted under federal Endangered Species Permit No. PRT-796835, issued to Dr. Thomas E. Kucera, under a Memorandum of Understanding between the California Department of Fish and Game and Thomas E. Kucera, and under Scientific Collecting Permit No.801009-02 issued to Thomas E. Kucera. Additional field personnel included: Anne Flannery, wildlife biologist; and Leslie Nendert, Joanna Canepa, and Marcie Rash of TtEM Inc.

2.2.2 Tissue Samples

Trap transects and grids were sited not only to maximize salt-marsh harvest mouse captures, but also to capture house mice (*Mus musculus*) as close as possible to a number of target soil-sample locations known to have elevated contaminant levels. Figures 3 and 4 show trap placement relative to target soil-sample locations. Traps in R Area were situated to cover RADSB011, RADSB010, RADSBD05, RADSBD07, RADSBC05, RADSBE07, RADSBF08, RADSBF06, RADSBG04, RADSBH06, RADSBI06, and RADSBI04. The Wood Hogger transect along Rhodes Road was established to sample WHSSBA02 and WHSSBH03. The Wood Hogger Southwest Upland grid was sited to sample WHSSB014, WHSSB016, and WHSSB009. Two target locations at Wood Hogger, WHSSBI02 and WHSSBH03, were under water so we did not set traps there. Figure 5 shows the extent of flooding at Wood Hogger site.

All captured house mice and deer mice (*Peromyscus maniculatus*) were sacrificed and placed in individually labeled plastic bags. These animals were then skinned, labeled, and shipped on ice to ITS Laboratory in Vermont. Data collected on these animals included date, location, trap number, species, and sex.

2.2.3 Habitat Characterization

We characterized the habitat at each site by collecting data on percent cover and plant species composition within a 1-meter-square plot, referred to below as a vegetation plot, centered on each of 158 traps. Anne Flannery and Tom Kucera collected data on vegetation plots, with assistance from Leslie Nendert.

DRAFT

3.0 Results and Discussion

DRAFT

3.1 Salt-marsh Harvest Mice

Thirteen salt-marsh harvest mice were captured live, processed, and released. Twelve of these were captured in R Area, a site with extensive pickleweed; one was captured in Southern Upland at Wood Hogger. Although salt-marsh harvest mice are most frequently associated with halophytic vegetation, especially pickleweed, they are also found in uplands adjacent to salt marshes (Shellhammer 1982). Thus, the capture in upland habitat at the Southern Upland is not unexpected. Data sheets are provided in Appendix A. Capture data are summarized in Table 1.

One salt-marsh harvest mouse was found dead in a trap the evening of 7 September at R Area when traps were being opened. It is unknown whether the animal was in the trap with an open door in the morning and the door was closed on it, or if the trap was simply missed when the others were checked that morning. As specified in the various permits, the U.S. Fish and Wildlife Service and the California Department of Fish and Game were notified; the carcass was frozen and deposited in the Museum of Vertebrate Zoology at the University of California at Berkeley.

Figures 6 and 7 show the locations of captured salt-marsh harvest mice.

3.2 Tissue Samples

A total of 63 house mice and 5 deer mice were collected. All deer mice and 12 house mice were captured at Wood Hogger Southern Upland. Two house mice were captured at Rhodes Road; there were no captures from Flooded Pickleweed. Fifty-one house mice were collected at R Area: 1 along the Berm, 4 along the East Line, 13 in the Grid, 16 along the Mid Line, and 17 along the West Line. On three separate occasions at both R Area and Wood Hogger, two house mice were captured in one trap. All house mice and deer were euthanized, skinned, sexed, and shipped on ice to ITS Laboratory in Vermont for tissue analysis. Capture data are presented in Table 1.

3.3 Habitat Characterization

According to WESCO 1995, several habitat types occur at the Tidal Area sites. Our trap transects and grids were placed among the following types, as described in that report: annual/ruderal upland complex, seasonal brackish/salt marsh mosaic, and salt marsh. There are no directly tidal habitats within R Area and Wood Hogger sites; flooding occurs seasonally as a result of rainfall. At the time of our visit, much of Wood Hogger was still flooded from previous winter rains (see Figure 5).

This study was not designed to collect habitat data that would support application of statistical tests or that would allow in-depth comparison of habitat variables. Nevertheless, our data support the general knowledge that salt-marsh harvest mice are most commonly found in association with pickleweed and that house mice and deer mice are found in a variety of habitats. Vegetation data are summarized in Table 2.

Further discussion by location is presented below.

DRAFT

3.3.1 Habitat at R Area

R Area traps were placed within two habitat types: annual/ruderal upland complex and seasonal brackish/salt marsh mosaic type (see WESCO 1995). Of the 119 vegetation plots measured in this area, plant cover was 100 percent at 101 plots (85% of plots). Forty (34%) were monotypic stands of pickleweed. Pickleweed was present at 102 plots (86%) and was the dominant ($\geq$ 50% cover) species at 88 plots (74% of plots).

Three other plant species were found to be dominant in some plots: fathen (*Atriplex triangularis*), alkali heath (*Frankenia salina*), and salt grass (*Distichlis spicata*). Forty-eight plots (40% of total) contained some fathen, and fathen was dominant at 13 (11%). Twenty-nine plots (24% of total) contained salt grass, and salt grass was dominant at 6 (5%). Nineteen plots (16% of total) contained alkali heath, and alkali heath was dominant at 5 (4%).

Other plant taxa observed include: curly dock (*Rumex crispus*), marsh rosemary (*Limonium californicum*), perennial peppergrass (*Lepidium latifolium*), goosefoot (*Chenopodium* sp.), brass buttons (*Cotula cornopifolia*), and a variety of unidentified forbs and grasses.

Of 12 captured SMHMs in R Area, all were captured at sites that had at least some pickleweed. Four were captured at sites with 100 percent pickleweed, four were captured at sites where pickleweed was dominant (all four with >75% pickleweed cover), and four were captured at sites with less than 50 percent pickleweed cover. Other plant species occurring in plots at which SMHMs were captured include: fathen, alkali heath, salt grass, goosefoot, and an unknown composite (Family Asteraceae).

Of 52 house mice captured in R Area, 13 (25%) were captured at sites with 100 percent pickleweed cover, and 38 (73%) were captured at sites that had at least 60 percent pickleweed cover. Another 6 (12%) were captured at sites that contained at least 60 percent fathen cover. Other plant species occurring in plots at which house mice were captured included: salt grass, other unidentified grasses, curly dock, peppergrass, alkali heath, brass buttons, goosefoot, marsh rosemary, and an unknown composite.

A number of plant species were found at house mouse capture locations that were not found at SMHM capture locations, including: curly dock, peppergrass, brass buttons, and marsh rosemary. Curly dock and peppergrass are known to occur in disturbed upland areas, and marsh rosemary is known to occur in upper zones of marshes. Brass buttons commonly

grows on mud and moist banks in salt marshes. It is not surprising that these species were not fount at SMHM capture sites, nor would it have been surprising to capture SHMHs at sites supporting these species.

We found no evidence that species richness (the number of plant species found on each plot) affected habitat use by either house mice or salt-marsh harvest mice. Of the 50 sites at which mice were captured in R Area, 20 (40%) contained only one plant species, 13 (26%) contained two plant species, 8 (16%) contained 3 plant species, 7 (14%) contained 4 plant species, 1 (2%) contained five plant species, and 1 (2%) contained 6 plant species. House mice, deer mice, and salt-marsh harvest mice would all be expected to occur at R Area. Our habitat data merely support known habitat use patterns by these species.

3.3.2 Habitat at Wood Hogger

DRAFT

In Wood Hogger, we placed 15 traps along Rhodes Road. This road was characterized by WESCO in 1995 as non-vegetated upland, and it was still unvegetated during a 1996 Ibis site visit (pers. obs.). At the time of our surveys in 1998, however, this roadway was covered with a tall, dense stand of weedy plants, primarily of the genus *Chenopodium* (this plant was not identified to species). Another 8 Wood Hogger traps were placed in a zone identified by WESCO 1995 as salt marsh; this is the site we called Flooded Pickleweed. The final 16 Wood Hogger traps were placed at a site we called Southern Upland. WESCO 1995 characterized this habitat as annual/ruderal upland complex, which corroborates what we found on site.

Of the 38 vegetation plots measured at Wood Hogger sites, plant cover was 100 percent at 33 (87%). Plant cover was less than 75 percent at only two plots. Ten were monotypic stands: seven of pickleweed, one of salt grass, one of goosefoot (*Chenopodium* sp.), and one of bird's foot trefoil (*Lotus corniculatus*).

Only 8 Wood Hogger traps were not in an upland habitat type. Plant cover at 7 of those 8 was 100 percent pickleweed (flooded); cover at the eighth was 100 percent salt grass (also flooded). Plant cover along Rhodes Road was primarily goosefoot. Dominant plant species at plots at Southern Upland were salt grass, bird's foot trefoil, and unidentified annual grasses. Other plant taxa observed at Wood Hogger include: English plantain (*Plantago lanceolata*), star thistle (*Centaurea solstitialis*), wild oats (*Avena fatua*), fennel (*Foeniculum vulgare*), and an unknown composite.

House mice, deer mice, and salt-marsh harvest mice were all captured at Wood Hogger. At Southern Upland, all 18 captured animals (12 house mice, 5 deer mice, and 1 SMHM) were found at sites containing at least 40 percent trefoil cover. The SMHM was captured at a plot containing 75 percent trefoil and 25 percent unidentified annual grasses. The closest pickleweed was about 300 feet away, but the site was situated on the edge of a brackish marsh. At the Rhodes Road site, both house mice were captured at sites dominated by goosefoot.

House mice, deer mice, and salt-marsh harvest mice would all be expected to occur at Wood Hogger. Our habitat data merely support known habitat use patterns of these species; however, we were surprised that we did not capture more house mice along Rhodes Road. As recently as two years ago, Rhodes Road was considered a non-vegetated upland. Perhaps house mice simply have not had time to colonize it thoroughly.

3.4 Incidental Wildlife Observations

While we did not maintain a list of incidental wildlife observations, we noted that R Area and Wood Hogger appeared to provide excellent foraging opportunities for a variety of birds, including snowy egrets (*Egretta thula*), northern harriers (*Circus cyaneus*), meadowlarks (*Sturnella neglecta*), dowitchers (*Limnodromus* sp.), willets (*Catoptrophorus semipalmatus*), black-necked stilts (*Himantopus mexicanus*), yellowlegs (*Tringa* sp.), great egrets (*Ardea alba*), and other wading birds, shorebirds, and passerines. Loggerhead shrikes (*Lanius ludovicianus*) were observed daily at Wood Hogger. Raccoon, canid, and skunk tracks were observed in the mud at R Area.

Of particular importance, several individual California clapper rails (federally and state listed as endangered) were heard daily in the brackish marsh along Otter Sluice. At least three individuals were heard calling in the marsh immediately west of Rhodes Road. Another individual (possibly two) was heard calling in the marsh along the sluice just west of the western border of R Area.

DRAFT

4.0 Summary

We documented the occurrence of two state and federally endangered species within or adjacent to Tidal Area sites: the salt-marsh harvest mouse and the California clapper rail. It would appear that at least small populations of both species are surviving or thriving at this location. Salt-marsh harvest mice were captured at both R Area (12 individuals) and Wood Hogger (1 individual). The salt-marsh harvest mouse captured at Wood Hogger was found in an upland habitat type. We collected a total of 51 house mice from R Area, and 14 house mice and 5 deer mice from Wood Hogger. Our habitat data support current knowledge that salt-marsh harvest mice are strongly associated with pickleweed and that house mice and deer mice can be found in a variety of habitats.

DRAFT

5.0 Literature Cited

Fisler, G.F. 1963. Effects of salt water on food and water consumption and weight of harvest mice. Ecology 44:604-608.

Fisler, G.F. 1965. Adaptations and speciation in harvest mice of the marshes of San Francisco Bay. University of California Publications in Zoology 77:1-108.

Geissel, W., H.S. Shellhammer, and T.T. Harvey. 1988. The ecology of the salt-marsh harvest mouse (*Reithrodontomys raviventris*) in a diked salt marsh. J. Mammal. 69:696-703.

Shellhammer, H.S. 1982. *Reithrodontomys raviventris*. Mammalian Species 169. 3pp.

Shellhammer, H.S. 1984. Identification of salt marsh harvest mice, *Reithrodontomys raviventris*, in the field and with cranial characteristics. Calif. Fish and Game 70:113-120.

Shellhammer, H.S. 1989. Salt marsh harvest mice, urban development, and rising sea levels. Conservation Biology 3:59-65.

Shellhammer, H.S., R. Jackson, W. Davilla, A. M. Gilroy, H.T. Harvey, and L. Simons. 1982. Habitat preferences of salt marsh harvest mice (*Reithrodontomys raviventris*). Wasmann Journal of Biology 40:102-114.

TtEMI (Tetra Tech EM Inc). 1998. Field sampling addendum, Concord Naval Weapons Station, Tidal Area Sites 2, 9, and 11. Prepared for Department of the Navy, San Bruno, CA.

WESCO. 1995. Qualitative habitat characterization report, Tidal Area Sites, Naval Weapons Station Concord. Draft. Prepared for PRC Environmental Management, Inc., San Francisco.

DRAFT

Table 1. Capture data, Concord Naval Weapons Station, September 1998.

Site	Subsite	Trap	Date	Species[1]	Number	Sex[2]
R Area	Berm	87	Sept 8	MUMU	1	M
R Area	East Line	92	Sept 8	MUMU	1	F
R Area	East Line	96	Sept 8	MUMU	1	M
R Area	East Line	97	Sept 7	MUMU	1	M
R Area	East Line	101	Sept 7	MUMU	1	F
R Area	Grid	3	Sept 7	MUMU	1	F
R Area	Grid	5	Sept 7	MUMU	1	M
R Area	Grid	5	Sept 8	MUMU	1	M
R Area	Grid	8	Sept 8	MUMU	1	F
R Area	Grid	9	Sept 8	MUMU	1	FP
R Area	Grid	102	Sept 8	MUMU	1	F
R Area	Grid	105	Sept 7	MUMU	1	F
R Area	Grid	106	Sept 7	MUMU	1	F
R Area	Grid	107	Sept 7	MUMU	2	M,F
R Area	Grid	113	Sept 7	MUMU	1	F
R Area	Grid	115	Sept 8	MUMU	1	M
R Area	Grid	118	Sept 6	MUMU	1	ND
R Area	Mid Line	32	Sept 7	MUMU	1	F
R Area	Mid Line	33	Sept 8	MUMU	1	F
R Area	Mid Line	34	Sept 6	MUMU	1	ND
R Area	Mid Line	34	Sept 7	MUMU	1	F
R Area	Mid Line	34	Sept 8	MUMU	1	M
R Area	Mid Line	35	Sept 7	MUMU	1	M
R Area	Mid Line	35	Sept 6	MUMU	1	ND
R Area	Mid Line	35	Sept 8	MUMU	1	M
R Area	Mid Line	55	Sept 6	MUMU	1	ND
R Area	Mid Line	57	Sept 6	MUMU	1	ND
R Area	Mid Line	60	Sept 7	MUMU	1	F
R Area	Mid Line	62	Sept 6	MUMU	1	ND
R Area	Mid Line	63	Sept 7	MUMU	1	F
R Area	Mid Line	63	Sept 8	MUMU	1	F
R Area	Mid Line	64	Sept 7	MUMU	1	M
R Area	Mid Line	64	Sept 6	MUMU	1	ND
R Area	West Line	11	Sept 7	MUMU	1	M
R Area	West Line	12	Sept 7	MUMU	1	M
R Area	West Line	12	Sept 8	MUMU	1	F
R Area	West Line	14	Sept 8	MUMU	1	M
R Area	West Line	14	Sept 6	MUMU	1	ND
R Area	West Line	16	Sept 8	MUMU	1	F
R Area	West Line	16	Sept 7	MUMU	1	F
R Area	West Line	18	Sept 6	MUMU	1	ND
R Area	West Line	18	Sept 8	MUMU	1	M
R Area	West Line	18	Sept 7	MUMU	1	F
R Area	West Line	19	Sept 7	MUMU	1	M
R Area	West Line	20	Sept 8	MUMU	1	F
R Area	West Line	24	Sept 7	MUMU	1	M

DRAFT

Table 1 *cont.* Capture data, Concord Naval Weapons Station, September 1998.

Site	Subsite	Trap	Date	Species	Number	Sex
R Area	West Line	25	Sept 8	MUMU	1	F
R Area	West Line	26	Sept 6	MUMU	1	ND
R Area	West Line	26	Sept 8	MUMU	1	M
R Area	West Line	26	Sept 7	MUMU	1	M
R Area	Berm	75	Sept 8	SMHM	1	M
R Area	Berm	77	Sept 8	SMHM	1	M
R Area	Berm	82	Sept 7	SMHM	1	F
R Area	East Line	91	Sept 8	SMHM	1	M
R Area	East Line	93	Sept 8	SMHM	1	M
R Area	Grid	119	Sept 8	SMHM	1	M
R Area	Grid	8	Sept 8	SMHMD	1	ND
R Area	Mid Line	53	Sept 8	SMHM	1	M
R Area	Mid Line	54	Sept 6	SMHM	1	F
R Area	Mid Line	59	Sept 8	SMHM	1	M
R Area	West Line	24	Sept 8	SMHM	1	M
R Area	West Line	30	Sept 8	SMHM	1	M
Wood Hogger	Rhodes Rd	25	Sept 8	MUMU	1	M
Wood Hogger	Rhodes Rd	38	Sept 7	MUMU	1	M
Wood Hogger	Southwest	1	Sept 7	MUMU	1	FP
Wood Hogger	Southwest	1	Sept 8	MUMU	2	M,M
Wood Hogger	Southwest	3	Sept 6	MUMU	1	ND
Wood Hogger	Southwest	5	Sept 8	MUMU	1	M
Wood Hogger	Southwest	9	Sept 8	MUMU	1	M
Wood Hogger	Southwest	9	Sept 6	MUMU	1	ND
Wood Hogger	Southwest	9	Sept 7	MUMU	1	F
Wood Hogger	Southwest	10	Sept 8	MUMU	2	M,M
Wood Hogger	Southwest	11	Sept 8	MUMU	1	M
Wood Hogger	Southwest	13	Sept 7	MUMU	1	F
Wood Hogger	Southwest	5	Sept 7	PEMA	1	F
Wood Hogger	Southwest	6	Sept 6	PEMA	1	ND
Wood Hogger	Southwest	6	Sept 8	PEMA	1	M
Wood Hogger	Southwest	12	Sept 8	PEMA	1	F
Wood Hogger	Southwest	13	Sept 8	PEMA	1	F
Wood Hogger	Southwest	4	Sept 8	SMHM	1	M

[1] MUMU=*Mus musculus* (house mouse); SMHM=*Reithrodontomys raviventris* (salt-marsh harvest mouse); PEMA=*Peromyscus maniculatus* (deer mouse); SMHMD=died in trap.

[2] ND=no data were taken; FP=pregnant female.

Table 2. Vegetation data from Concord Tidal Area Sites, September 1998.

Site	Subsite	Trap	Pct Cover	PctxSpecies	Species*
R Area	Berm	70	100	90	Pickleweed
R Area	Berm	70	100	10	Salt grass
R Area	Berm	71	100	70	Salt grass
R Area	Berm	71	100	25	Pickleweed
R Area	Berm	71	100	5	Limonium
R Area	Berm	72	100	50	Frankenia
R Area	Berm	72	100	40	Salt grass
R Area	Berm	72	100	5	Limonium
R Area	Berm	72	100	5	Unknown composite
R Area	Berm	73	100	80	Pickleweed
R Area	Berm	73	100	20	Fathen
R Area	Berm	74	100	100	Pickleweed
R Area	Berm	75	100	100	Pickleweed
R Area	Berm	76	100	60	Frankenia
R Area	Berm	76	100	20	Salt grass
R Area	Berm	76	100	10	Unknown composite
R Area	Berm	76	100	10	Fathen
R Area	Berm	77	100	40	Pickleweed
R Area	Berm	77	100	40	Salt grass
R Area	Berm	77	100	10	Frankenia
R Area	Berm	77	100	10	Fathen
R Area	Berm	78	100	40	Frankenia
R Area	Berm	78	100	25	Salt grass
R Area	Berm	78	100	20	Pickleweed
R Area	Berm	78	100	10	Lepidium latifolium
R Area	Berm	78	100	5	Unknown composite
R Area	Berm	79	100	50	Salt grass
R Area	Berm	79	100	30	Frankenia
R Area	Berm	79	100	10	Limonium
R Area	Berm	79	100	10	Unknown composite
R Area	Berm	80	100	50	Salt grass
R Area	Berm	80	100	50	Frankenia
R Area	Berm	81	100	60	Pickleweed
R Area	Berm	81	100	30	Salt grass
R Area	Berm	81	100	10	Frankenia
R Area	Berm	82	100	85	Pickleweed
R Area	Berm	82	100	15	Salt grass
R Area	Berm	83	100	95	Pickleweed
R Area	Berm	83	100	5	Salt grass
R Area	Berm	84	100	75	Pickleweed
R Area	Berm	84	100	20	Fathen
R Area	Berm	84	100	5	Frankenia
R Area	Berm	85	100	100	Pickleweed
R Area	Berm	86	100	95	Pickleweed
R Area	Berm	86	100	5	Fathen

Table 2 cont. Vegetation data from Concord Tidal Area Sites.

Site	Subsite	Trap	Pct Cover	PctxSpecies	Species*
R Area	Berm	87	100	80	Pickleweed
R Area	Berm	87	100	15	Salt grass
R Area	Berm	87	100	5	Fathen
R Area	Berm	88	100	95	Pickleweed
R Area	Berm	88	100	5	Salt grass
R Area	Berm	89	100	100	Pickleweed
R Area	Berm	90	100	100	Pickleweed
R Area	EastLine	91	100	50	Salt grass
R Area	EastLine	91	100	25	Pickleweed
R Area	EastLine	91	100	15	Fathen
R Area	EastLine	91	100	10	Frankenia
R Area	EastLine	92	100	75	Pickleweed
R Area	EastLine	92	100	25	Fathen
R Area	EastLine	93	100	95	Pickleweed
R Area	EastLine	93	100	5	Fathen
R Area	EastLine	94	100	95	Pickleweed
R Area	EastLine	94	100	5	Fathen
R Area	EastLine	95	100	95	Pickleweed
R Area	EastLine	95	100	5	Salt grass
R Area	EastLine	96	100	100	Pickleweed
R Area	EastLine	97	100	100	Pickleweed
R Area	EastLine	98	100	75	Pickleweed
R Area	EastLine	98	100	25	Fathen
R Area	EastLine	99	100	75	Frankenia
R Area	EastLine	99	100	20	Pickleweed
R Area	EastLine	99	100	5	Fathen
R Area	EastLine	100	100	70	Pickleweed
R Area	EastLine	100	100	20	Frankenia
R Area	EastLine	100	100	10	Fathen
R Area	EastLine	101	100	80	Pickleweed
R Area	EastLine	101	100	15	Fathen
R Area	EastLine	101	100	5	Unknown composite
R Area	Grid	1	100	95	Pickleweed
R Area	Grid	1	100	3	DD Grass
R Area	Grid	1	100	2	Fathen
R Area	Grid	2	100	99	DD Grass
R Area	Grid	2	100	1	Salt grass
R Area	Grid	3	100	50	Fathen
R Area	Grid	3	100	30	Lepidium
R Area	Grid	3	100	20	DD Grass
R Area	Grid	4	100	50	Pickleweed
R Area	Grid	4	100	50	Fathen
R Area	Grid	5	100	60	Pickleweed
R Area	Grid	5	100	40	Fathen
R Area	Grid	6	100	60	Fathen
R Area	Grid	6	100	30	Pickleweed
R Area	Grid	6	100	5	DD Grass
R Area	Grid	6	100	5	Unknown composite

Table 2 cont. Vegetation data from Concord Tidal Area Sites.

Site	Subsite	Trap	Pct Cover	PctxSpecies	Species*
R Area	Grid	7	100	100	Pickleweed
R Area	Grid	8	100	40	Salt grass
R Area	Grid	8	100	30	Pickleweed
R Area	Grid	8	100	15	Fathen
R Area	Grid	8	100	10	DD Grass
R Area	Grid	8	100	5	Unknown composite
R Area	Grid	9	100	50	Fathen
R Area	Grid	9	100	50	Pickleweed
R Area	Grid	10	100	50	Fathen
R Area	Grid	10	100	50	Pickleweed
R Area	Grid	102	100	100	Pickleweed
R Area	Grid	103	100	90	DD Grass
R Area	Grid	103	100	10	Salt grass
R Area	Grid	104	75	85	DD Grass
R Area	Grid	104	75	15	Rumex
R Area	Grid	105	100	90	Fathen
R Area	Grid	105	100	10	Lepidium
R Area	Grid	106	100	60	DD Grass
R Area	Grid	106	100	30	Lepidium
R Area	Grid	106	100	5	Limonium
R Area	Grid	106	100	5	Fathen
R Area	Grid	107	100	95	Pickleweed
R Area	Grid	107	100	5	Fathen
R Area	Grid	108	100	100	Pickleweed
R Area	Grid	109	100	50	Fathen
R Area	Grid	109	100	50	Pickleweed
R Area	Grid	111	90	60	Pickleweed
R Area	Grid	111	90	40	Fathen
R Area	Grid	112	100	30	Frankenia
R Area	Grid	112	100	30	DD Grass
R Area	Grid	112	100	30	Fathen
R Area	Grid	112	100	10	Unknown composite
R Area	Grid	113	100	80	Fathen
R Area	Grid	113	100	10	Frankenia
R Area	Grid	113	100	10	DD Grass
R Area	Grid	114	100	40	Frankenia
R Area	Grid	114	100	30	Fathen
R Area	Grid	114	100	20	Pickleweed
R Area	Grid	114	100	10	DD Grass
R Area	Grid	115	100	100	Pickleweed
R Area	Grid	116	100	75	Pickleweed
R Area	Grid	116	100	20	DD Grass
R Area	Grid	116	100	5	Fathen
R Area	Grid	117	100	40	Fathen
R Area	Grid	117	100	30	Pickleweed
R Area	Grid	117	100	20	Unknown composite
R Area	Grid	117	100	10	DD Grass

Table 2 cont. Vegetation data from Concord Tidal Area Sites.

Site	Subsite	Trap	Pct Cover	PctxSpecies	Species*
R Area	Grid	118	100	100	Pickleweed
R Area	Grid	119	100	80	Pickleweed
R Area	Grid	119	100	20	Fathen
R Area	Grid	120	100	70	Fathen
R Area	Grid	120	100	10	DD Grass
R Area	Grid	120	100	10	Unknown composite
R Area	Grid	120	100	10	Pickleweed
R Area	MidLine	31	100	70	Salt grass
R Area	MidLine	31	100	25	DD Grass
R Area	MidLine	31	100	5	Unknown composite
R Area	MidLine	32	100	100	Pickleweed
R Area	MidLine	33	100	90	Pickleweed
R Area	MidLine	33	100	10	Salt grass
R Area	MidLine	34	100	100	Pickleweed
R Area	MidLine	35	100	90	Pickleweed
R Area	MidLine	35	100	10	Cotula
R Area	MidLine	36	100	60	Pickleweed
R Area	MidLine	36	100	40	Fathen
R Area	MidLine	37	40	100	Pickleweed
R Area	MidLine	38	20	100	Pickleweed
R Area	MidLine	39	20	100	Pickleweed
R Area	MidLine	40	20	100	Pickleweed
R Area	MidLine	41	20	100	Pickleweed
R Area	MidLine	42	30	100	Pickleweed
R Area	MidLine	43	60	100	Pickleweed
R Area	MidLine	44	60	100	Pickleweed
R Area	MidLine	45	20	100	Pickleweed
R Area	MidLine	46	30	100	Pickleweed
R Area	MidLine	47	30	100	Pickleweed
R Area	MidLine	48	30	100	Pickleweed
R Area	MidLine	49	40	100	Pickleweed
R Area	MidLine	50	90	100	Pickleweed
R Area	MidLine	51	90	100	Pickleweed
R Area	MidLine	52	75	100	Pickleweed
R Area	MidLine	53	100	100	Pickleweed
R Area	MidLine	54	100	100	Pickleweed
R Area	MidLine	55	100	100	Pickleweed
R Area	MidLine	56	100	100	Pickleweed
R Area	MidLine	57	100	100	Pickleweed
R Area	MidLine	58	100	100	Pickleweed
R Area	MidLine	59	100	100	Pickleweed
R Area	MidLine	60	100	75	Pickleweed
R Area	MidLine	60	100	25	Fathen
R Area	MidLine	61	100	95	Pickleweed
R Area	MidLine	61	100	5	Unknown composite
R Area	MidLine	62	100	60	Pickleweed
R Area	MidLine	62	100	30	Fathen
R Area	MidLine	62	100	10	DD Grass

Table 2 cont. Vegetation data from Concord Tidal Area Sites.

Site	Subsite	Trap	Pct Cover	PctxSpecies	Species*
R Area	MidLine	63	100	75	Pickleweed
R Area	MidLine	63	100	10	Unknown composite
R Area	MidLine	63	100	10	Salt grass
R Area	MidLine	63	100	5	Fathen
R Area	MidLine	64	100	75	Fathen
R Area	MidLine	64	100	15	Pickleweed
R Area	MidLine	64	100	10	Salt grass
R Area	MidLine	65	100	75	Fathen
R Area	MidLine	65	100	20	Pickleweed
R Area	MidLine	65	100	5	Frankenia
R Area	MidLine	66	100	75	Frankenia
R Area	MidLine	66	100	15	Salt grass
R Area	MidLine	66	100	10	Pickleweed
R Area	MidLine	67	100	50	Pickleweed
R Area	MidLine	67	100	40	Salt grass
R Area	MidLine	67	100	10	Frankenia
R Area	MidLine	68	100	90	Pickleweed
R Area	MidLine	68	100	10	Salt grass
R Area	MidLine	69	100	60	Pickleweed
R Area	MidLine	69	100	40	Salt grass
R Area	WestLine	11	100	75	Pickleweed
R Area	WestLine	11	100	25	Fathen
R Area	WestLine	12	100	30	DD Grass
R Area	WestLine	12	100	30	Lepidium
R Area	WestLine	12	100	30	Fathen
R Area	WestLine	12	100	10	Unknown composite
R Area	WestLine	13	100	60	Fathen
R Area	WestLine	13	100	30	Rumex
R Area	WestLine	13	100	10	Unknown composite
R Area	WestLine	14	100	80	Fathen
R Area	WestLine	14	100	10	Rumex
R Area	WestLine	14	100	10	DD Grass
R Area	WestLine	15	100	60	Pickleweed
R Area	WestLine	15	100	20	DD Grass
R Area	WestLine	15	100	20	Fathen
R Area	WestLine	16	100	95	Pickleweed
R Area	WestLine	16	100	5	Chenopodium
R Area	WestLine	17	100	90	Pickleweed
R Area	WestLine	17	100	10	Chenopodium
R Area	WestLine	18	100	90	Pickleweed
R Area	WestLine	18	100	10	Chenopodium
R Area	WestLine	19	100	90	Pickleweed
R Area	WestLine	19	100	10	Chenopodium
R Area	WestLine	20	100	100	Pickleweed
R Area	WestLine	21	100	75	Pickleweed
R Area	WestLine	21	100	25	Chenopodium
R Area	WestLine	22	100	90	Pickleweed
R Area	WestLine	22	100	10	Chenopodium

Table 2 cont. Vegetation data from Concord Tidal Area Sites.

Site	Subsite	Trap	Pct Cover	PctxSpecies	Species*
R Area	WestLine	23	100	40	Chenopodium
R Area	WestLine	23	100	30	Salt grass
R Area	WestLine	23	100	20	Frankenia
R Area	WestLine	23	100	10	Unknown composite
R Area	WestLine	24	100	50	Salt grass
R Area	WestLine	24	100	30	Pickleweed
R Area	WestLine	24	100	10	Chenopodium
R Area	WestLine	24	100	10	Unknown composite
R Area	WestLine	25	100	100	Pickleweed
R Area	WestLine	26	100	90	Pickleweed
R Area	WestLine	26	100	10	Fathen
R Area	WestLine	27	100	95	Pickleweed
R Area	WestLine	27	100	5	Fathen
R Area	WestLine	28	100	100	Pickleweed
R Area	WestLine	29	100	50	Pickleweed
R Area	WestLine	29	100	30	Salt grass
R Area	WestLine	29	100	20	Fathen
R Area	WestLine	30	100	75	Pickleweed
R Area	WestLine	30	100	15	Frankenia
R Area	WestLine	30	100	10	Unknown composite
Wood Hogger	RhodesRd	25	100	98	Chenopodium
Wood Hogger	RhodesRd	25	100	2	DD Grass
Wood Hogger	RhodesRd	26	100	95	Chenopodium
Wood Hogger	RhodesRd	26	100	5	Fennel
Wood Hogger	RhodesRd	27	100	95	Chenopodium
Wood Hogger	RhodesRd	27	100	5	Unknown composite
Wood Hogger	RhodesRd	28	100	60	Unknown shrub
Wood Hogger	RhodesRd	28	100	40	Chenopodium
Wood Hogger	RhodesRd	29	75	90	Chenopodium
Wood Hogger	RhodesRd	29	75	10	Plantago
Wood Hogger	RhodesRd	30	75	100	Chenopodium
Wood Hogger	RhodesRd	31	75	65	DD Grass
Wood Hogger	RhodesRd	31	75	30	Chenopodium
Wood Hogger	RhodesRd	31	75	5	Fennel
Wood Hogger	RhodesRd	32	100	75	Chenopodium
Wood Hogger	RhodesRd	32	100	25	DD Grass
Wood Hogger	RhodesRd	33	100	60	DD Grass
Wood Hogger	RhodesRd	33	100	30	Chenopodium
Wood Hogger	RhodesRd	33	100	5	Wild oats
Wood Hogger	RhodesRd	33	100	5	Star thistle
Wood Hogger	RhodesRd	34	100	75	Fennel
Wood Hogger	RhodesRd	34	100	25	DD Grass
Wood Hogger	RhodesRd	35	100	75	Chenopodium
Wood Hogger	RhodesRd	35	100	25	Fennel

Table 2 cont. Vegetation data from Concord Tidal Area Sites.

Site	Subsite	Trap	Pct Cover	PctxSpecies	Species*
Wood Hogger	RhodesRd	37	100	40	DD Grass
Wood Hogger	RhodesRd	37	100	25	Fennel
Wood Hogger	RhodesRd	37	100	25	Chenopodium
Wood Hogger	RhodesRd	37	100	10	Wild oats
Wood Hogger	RhodesRd	38	100	75	Chenopodium
Wood Hogger	RhodesRd	38	100	25	DD Grass
Wood Hogger	RhodesRd	39	100	60	Fennel
Wood Hogger	RhodesRd	39	100	20	DD Grass
Wood Hogger	RhodesRd	39	100	20	Chenopodium
Wood Hogger	RhodesRd	40	100	50	Chenopodium
Wood Hogger	RhodesRd	40	100	30	Fennel
Wood Hogger	RhodesRd	40	100	20	DD Grass
Wood Hogger	Fl Pickleweed	17	100	100	Pickleweed
Wood Hogger	Fl Pickleweed	18	100	100	Pickleweed
Wood Hogger	Fl Pickleweed	19	100	100	Pickleweed
Wood Hogger	Fl Pickleweed	20	100	100	Pickleweed
Wood Hogger	Fl Pickleweed	21	100	100	Pickleweed
Wood Hogger	Fl Pickleweed	22	100	100	Salt grass
Wood Hogger	Fl Pickleweed	23	100	100	Pickleweed
Wood Hogger	Fl Pickleweed	24	100	100	Pickleweed
Wood Hogger	Upland	1	100	50	Lotus
Wood Hogger	Upland	1	100	30	Salt grass
Wood Hogger	Upland	1	100	20	DD Grass
Wood Hogger	Upland	2	100	75	Lotus
Wood Hogger	Upland	2	100	25	DD Grass
Wood Hogger	Upland	3	100	90	Lotus
Wood Hogger	Upland	3	100	10	Wild oats
Wood Hogger	Upland	4	100	75	Lotus
Wood Hogger	Upland	4	100	25	DD Grass
Wood Hogger	Upland	5	20	90	Lotus
Wood Hogger	Upland	5	20	2	Star thistle
Wood Hogger	Upland	6	100	100	Lotus
Wood Hogger	Upland	7	75	65	Unknown
Wood Hogger	Upland	7	75	35	Salt grass
Wood Hogger	Upland	8	100	50	Salt grass
Wood Hogger	Upland	8	100	50	Lotus
Wood Hogger	Upland	9	100	70	DD Grass
Wood Hogger	Upland	9	100	20	Lotus
Wood Hogger	Upland	9	100	10	Plantago
Wood Hogger	Upland	10	100	75	Lotus
Wood Hogger	Upland	10	100	25	Salt grass
Wood Hogger	Upland	11	100	50	Lotus
Wood Hogger	Upland	11	100	50	Salt grass
Wood Hogger	Upland	12	100	50	Salt grass
Wood Hogger	Upland	12	100	40	Lotus
Wood Hogger	Upland	12	100	10	Unknown composite
Wood Hogger	Upland	13	100	50	Lotus
Wood Hogger	Upland	13	100	50	Salt grass

Table 2 cont. Vegetation data from Concord Tidal Area Sites.

Site	Subsite	Trap	Pct Cover	PctxSpecies	Species*
Wood Hogger	Upland	14	100	80	Salt grass
Wood Hogger	Upland	14	100	20	Fennel
Wood Hogger	Upland	15	100	40	Unknown composite
Wood Hogger	Upland	15	100	30	Lotus
Wood Hogger	Upland	15	100	30	Salt grass

* DD Grass=Dead, dry grass; Unknown composite=Family Asteraceae. See text for scientific names.

Figures 1-7

These detailed station maps have been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.

APPENDIX A
Completed SMHM Data Forms

HARVEST MOUSE DATA SHEET

Number: 1 Date: 9/6/98

Trapline/Station: R54 Species Designation: reithrodontomys megalotis non perforate

Sex: M or (F) Age: Adult or (Juv.) Breeding Condition: non lactating

Project Number: _____ Location: R Area

Morphological Characteristics Score NWS concord

	0	1	2
Tail Diameter 20mm from body: 2 mm	(>2.1mm)	Interm.	<2.0mm
Dorsal/Ventral Contrast	Unicolor	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	Brown/(Tan)	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	(Interm.)	Pointed/good taper
Cumulative Score:	0	1	

Belly Coloration:* Type 3 Comments: _____

Head and Body Length: 9.5cm Tail Length: 7.1 cm T/B%: _____

Orange Ear Tufts: (Yes) or No

Behavior: Active or (Docile) Comments: face mark at 20mm on tail

Habitat/Vegetation at Trap Site: Dicks in woods

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
(3)) Cinnamon pectoral band
5) Suffused cinnamon over white (1/2) white
7) Cinnamon or buff (no white)
2) Cinnamon pectoral spot
4) Pectoral band with center stripe extending down bell (3/4 white)
6) Trace of white (1/4 white)

HARVEST MOUSE DATA SHEET

Number: ~~R-82~~ 2

Date: 9/7/98

Trapline/Station: R-82

Species Designation: Rera

Sex: M or (F) Age: (Adult) or Juv.

Breeding Condition: ~~lactating~~ pregnan

Project Number: _____

Location: NWS Concord

Morphological Characteristics

Score R-Area

Tail			
Diameter 20mm from body: ~~[illegible]~~ ~~20~~ 2.1 mm	0	1	2
Dorsal/Ventral Contrast	(>2.1mm)	Interm.	<2.0mm
	(Unicolor)	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	(Brown/Tan)	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	(Interm.)	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 1 Comments: _____

Head and Body Length: 140 Tail Length: 68mm T/B%: _____

Orange Ear Tufts: (Yes) or No

Behavior: (Active) or Docile Comments: _____

Habitat/Vegetation at Trap Site: _____

Weight 18g

* Belly Coloration Pattern (Fisler 1965)

1) (White/grayish)
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 3 Date: 9/7/98

Trapline/Station: B-1 Species Designation: Rera

Sex: M or F Age: Adult or Juv. Breeding Condition: Scrotal ♂

Project Number: _____ Location: NWS Concord

Morphological Characteristics Score R-Area

Tail	0	1	2
Diameter 20mm from body: 22 mm	>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast	Unicolor	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	Brown/Tan	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	Interm.	Pointed/good taper

Cumulative Score: 2

Belly Coloration:* Type 1 Comments: _____

Head and Body Length: [illegible] Tail Length: 10 mm T/B%: _____

Orange Ear Tufts: Yes or No

Behavior: Active or Docile Comments: _____

Habitat/Vegetation at Trap Site: 100% [illegible]

Weight = 12g

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 4

Date: 9/8/98

Trapline/Station: [illegible]

Species Designation: Pera

Sex: M or F Age: Adult or Juv.

Breeding Condition: nonscrotal

Project Number:

Location: [illegible]

Morphological Characteristics

Score K-Area

Tail	0	1	2
Diameter 20mm from body: 4 mm	>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast	Unicolor	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	Brown/Tan	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	Interm.	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 1 Comments:

Head and Body Length: [illegible] Tail Length: [illegible] T/B%:

Orange Ear Tufts: Yes or No

Behavior: Active or Docile Comments:

Habitat/Vegetation at Trap Site: [illegible], Pickleweed

weight 10g

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 5

Date: 9/8/98

Trapline/Station: R30

Species Designation: Reva

Sex: M or F Age: Adult or Juv.

Breeding Condition: Scrotal

Project Number:

Location: NWS Concord

Morphological Characteristics

Score R-Area

Tail	0	1	2
Diameter 20mm from body: 2.2 mm	>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast	Unicolor	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	Brown/Tan	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	Interm.	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 1 Comments:

Head and Body Length: 125 Tail Length: 73 T/B%:

Orange Ear Tufts: Yes or No

Behavior: Active or Docile Comments:

Habitat/Vegetation at Trap Site: pickweed frankenia unknown comp

weight NONE

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 6

Date: 9/8

Trapline/Station: R77

Species Designation: Rera

Sex: M or F Age: Adult or Juv.

Breeding Condition: nonreistae

Project Number:

Location: Nove [illegible]

Morphological Characteristics

Score R-Area

Tail	0	1	2
Diameter 20mm from body: 24 mm	>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast	Unicolor	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	Brown/Tan	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	Interm.	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 3 Comments:

Head and Body Length: 135 Tail Length: 73 T/B%:

Orange Ear Tufts: Yes or No

Behavior: Active or Docile Comments:

Habitat/Vegetation at Trap Site: Saltgrass, Frankenia, pickleweed, Atriplex

weight 10g

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 1 Date: 9/8/98

Trapline/Station: RF15 Species Designation: Rera

Sex: (M) or F Age: (Adult) or Juv. Breeding Condition: Scrotal

Project Number: _____ Location: NWS Concord

Morphological Characteristics Score Rarea

Tail	0	1	2
Diameter 20mm from body: 2.3 mm	~~>2.1mm~~	Interm.	<2.0mm
Dorsal/Ventral Contrast	(Unicolor)	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	(Brown/Tan)	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	(Interm.)	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 1 Comments: _____

Head and Body Length: 145 Tail Length: 85 T/B%: _____

Orange Ear Tufts: (Yes) or No

Behavior: (Active) or Docile Comments: _____

Habitat/Vegetation at Trap Site: 98% orchardgrass, some Saltgrass

Weight 15g

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 8

Date: 9/8/98

Trapline/Station: R41

Species Designation: Reva

Sex: (M) or F Age: Adult or Juv.

Breeding Condition: nonscrotal

Project Number: _____

Location: NWS Concord

Morphological Characteristics

Score Rarea

Tail	0	1	2
Diameter 20mm from body: 2.3 mm	>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast	Unicolor	(Indistinctly Bicolor)	Distinctly Bicolor
Color of Ventral Hairs	Brown/(Tan)	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	(Interm.)	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 1 Comments: _____

Head and Body Length: 140 Tail Length: 71 T/B%: _____

Orange Ear Tufts: Yes or (No)

Behavior: (Active) or Docile Comments: _____

Habitat/Vegetation at Trap Site: pickleweed, [illegible], Satsuma, Frankenia

weight 11g

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 9 Date: 9/8/98

Trapline/Station: R93 Species Designation: Rera

Sex: M or F Age: Adult or Juv. Breeding Condition: nonscrotal

Project Number: _____ Location: NWS Concord

Morphological Characteristics Score RArea

Tail	0	1	2
Diameter 20mm from body: ____mm	>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast	Unicolor	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	Brown/Tan	Interm.	White or Gray
Tail Tip and Taper	Blunt/no taper	Interm.	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 2 Comments: _____

Head and Body Length: _____ Tail Length: 71 T/B%: _____

Orange Ear Tufts: Yes or No

Behavior: Active or Docile Comments: _____

Habitat/Vegetation at Trap Site: 98% pickleweed c̄ Atriplex escaped

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 10 Date: 9/8/98

Trapline/Station: RL9 Species Designation: Rera

Sex: (M) or F Age: Adult or Juv. Breeding Condition: nonscrotal

Project Number: Location: NWS Concord

Morphological Characteristics Score Rarea

Tail	0	1	2
Diameter 20mm from body: 3.3 mm	>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast	(Unicolor)	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	(Brown/Tan)	Interm.	White or Gray
Tail Tip and Taper	(Blunt/no taper)	Interm.	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 2 Comments:

Head and Body Length: 144 Tail Length: 77 T/B%:

Orange Ear Tufts: (Yes) or No

Behavior: (Active) or Docile Comments:

Habitat/Vegetation at Trap Site: pickleweed 100%

weight 14g

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 11 Date: 9/8/98

Trapline/Station: R53 Species Designation: Rera

Sex: (M) or F Age: Adult or Juv. Breeding Condition: Scrotal

Project Number: _____ Location: NWS Concord

Morphological Characteristics Score Rarca

		0	1	2
Tail Diameter 20mm from body: 2.2 mm		>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast		Unicolor	(Indistinctly Bicolor)	Distinctly Bicolor
Color of Ventral Hairs		(Brown/Tan)	Interm.	White or Gray
Tail Tip and Taper		Blunt/no taper	(Interm.)	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 2 Comments: _____

Head and Body Length: 122 Tail Length: 68 T/B%: _____

Orange Ear Tufts: (Yes) or No

Behavior: (Active) or Docile Comments: BIT DM1

Habitat/Vegetation at Trap Site: 100% pickleweed 95% cove

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

HARVEST MOUSE DATA SHEET

Number: 12

Date: 9/8/98

Trapline/Station: W4

Species Designation: Rera

Sex: (M) or F Age: Adult or Juv.

Breeding Condition: Scrotal

Project Number: _____

Location: NWS Concord

Morphological Characteristics

Score Wood Hogger

Tail	0	1	2
Diameter 20mm from body: 2.2 mm	>2.1mm	Interm.	<2.0mm
Dorsal/Ventral Contrast	(Unicolor)	Indistinctly Bicolor	Distinctly Bicolor
Color of Ventral Hairs	(Brown/Tan)	Interm.	White or Gray
Tail Tip and Taper	(Blunt/no taper)	Interm.	Pointed/good taper

Cumulative Score:

Belly Coloration:* Type 1 Comments: _____

Head and Body Length: 150 Tail Length: 60 T/B%: _____

Orange Ear Tufts: (Yes) or No

Behavior: (Active) or Docile Comments: _____

Habitat/Vegetation at Trap Site: UPLAND: chenopod dry grass edge of brackish marsh, no pickleweed in sight weight 11g (pickleweed stand ~50 yds away)

* Belly Coloration Pattern (Fisler 1965)

1) White/grayish
2) Cinnamon pectoral spot
3) Cinnamon pectoral band
4) Pectoral band with center stripe extending down bell (3/4 white)
5) Suffused cinnamon over white (1/2) white
6) Trace of white (1/4 white)
7) Cinnamon or buff (no white)

APPENDIX P

COMPARISON OF DETECTION LIMITS ACHIEVED TO SCREENING VALUES

LIST OF TABLES

Table

P-1 DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSES

P-2 DETECTION LIMITS FOR WET-ACID ANALYSES

P-3 DETECTION LIMITS FOR WET-DI ANALYSES

P-4 DETECTION LIMITS FOR SURFACE WATER ANALYSES

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
AROMV	BENZENE	56	56	56				UG/KG
AROMV	ETHYLBENZENE	56	56	56				UG/KG
AROMV	TOLUENE	56	56	56				UG/KG
AROMV	XYLENE (TOTAL)	56	56	56				UG/KG
CHROM	HEXAVALENT CHROMIUM	50	2	250				UG/KG
DIOXIN	1,2,3,4,6,7,8,9-OCDD	2	0.22	3				UG/KG
DIOXIN	1,2,3,4,6,7,8,9-OCDF	1	0.083	2				UG/KG
DIOXIN	1,2,3,4,6,7,8-HPCDD	1	0.056	3				UG/KG
DIOXIN	1,2,3,4,6,7,8-HPCDF	0.4	0.08	1				UG/KG
DIOXIN	1,2,3,4,7,8,9-HPCDF	0.6	0.04	2				UG/KG
DIOXIN	1,2,3,4,7,8-HXCDD	0.8	0.048	2				UG/KG
DIOXIN	1,2,3,4,7,8-HXCDF	0.3	0.023	0.7				UG/KG
DIOXIN	1,2,3,6,7,8-HXCDD	0.8	0.048	2				UG/KG
DIOXIN	1,2,3,6,7,8-HXCDF	0.2	0.023	0.6				UG/KG
DIOXIN	1,2,3,7,8,9-HXCDD	0.8	0.048	2				UG/KG
DIOXIN	1,2,3,7,8,9-HXCDF	0.3	0.023	0.8				UG/KG
DIOXIN	1,2,3,7,8-PECDD	0.5	0.055	1				UG/KG
DIOXIN	1,2,3,7,8-PECDF	0.2	0.039	0.4				UG/KG
DIOXIN	2,3,4,6,7,8-HXCDF	0.3	0.023	0.7				UG/KG
DIOXIN	2,3,4,7,8-PECDF	0.2	0.039	0.4				UG/KG
DIOXIN	2,3,7,8-TCDD	0.3	0.015	0.7				UG/KG
DIOXIN	2,3,7,8-TCDF	0.1	0.062	0.3				UG/KG
DIOXIN	TOTAL HPCDD	1	0.12	3				UG/KG
DIOXIN	TOTAL HPCDF	0.4	0.08	1				UG/KG
DIOXIN	TOTAL HXCDD	0.8	0.054	2				UG/KG
DIOXIN	TOTAL HXCDF	0.2	0.061	0.6				UG/KG
DIOXIN	TOTAL PECDD	0.5	0.055	1				UG/KG
DIOXIN	TOTAL PECDF	0.2	0.039	0.4				UG/KG
DIOXIN	TOTAL TCDD	0.3	0.015	0.7				UG/KG
DIOXIN	TOTAL TCDF	0.1	0.062	0.3				UG/KG
EXPLOSIVE	1,3,5-TRINITROBENZENE	120	120	124				UG/KG
EXPLOSIVE	1,3-DINITROBENZENE	120	120	124				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
EXPLOSIVE	2,4,6-TRINITROTOLUENE	120	120	124				UG/KG
EXPLOSIVE	2,4-DINITROTOLUENE	120	120	124				UG/KG
EXPLOSIVE	2,6-DINITROTOLUENE	120	120	124				UG/KG
EXPLOSIVE	2-NITROTOLUENE	120	120	124				UG/KG
EXPLOSIVE	3-NITROTOLUENE	120	120	124				UG/KG
EXPLOSIVE	4-NITROTOLUENE	120	120	124				UG/KG
EXPLOSIVE	HMX	120	120	124				UG/KG
EXPLOSIVE	NITROBENZENE	120	120	124				UG/KG
EXPLOSIVE	RDX	120	120	124				UG/KG
EXPLOSIVE	TETRYL	120	120	120				UG/KG
LPEST	2,4'-DDD	0.2	0.1	7				UG/KG
LPEST	2,4'-DDE	0.2	0.1	7				UG/KG
LPEST	2,4'-DDT	0.2	0.1	7				UG/KG
LPEST	4,4'-DDD	0.2	0.1	7				UG/KG
LPEST	4,4'-DDE	0.2	0.1	7				UG/KG
LPEST	4,4'-DDT	0.2	0.1	7				UG/KG
LPEST	ALDRIN	0.2	0.1	7				UG/KG
LPEST	ALPHA-BHC	0.4	0.2	0.9				UG/KG
LPEST	ALPHA-CHLORDANE	0.2	0.1	7				UG/KG
LPEST	BETA-BHC	0.4	0.2	0.9				UG/KG
LPEST	CIS-NONACHLOR	0.4	0.2	0.9				UG/KG
LPEST	DELTA-BHC	0.4	0.2	0.9				UG/KG
LPEST	DIELDRIN	0.2	0.1	7	0.02	8	0.44	UG/KG
LPEST	ENDOSULFAN I	0.4	0.2	0.9				UG/KG
LPEST	ENDOSULFAN II	0.4	0.2	0.9				UG/KG
LPEST	ENDOSULFAN SULFATE	0.4	0.2	0.9				UG/KG
LPEST	ENDRIN	0.4	0.2	0.9	0.02	45	NA	UG/KG
LPEST	ENDRIN ALDEHYDE	0.4	0.2	0.9				UG/KG
LPEST	ENDRIN KETONE	0.4	0.2	0.9				UG/KG
LPEST	GAMMA-BHC (LINDANE)	0.2	0.1	7				UG/KG
LPEST	GAMMA-CHLORDANE	0.4	0.2	0.9				UG/KG
LPEST	HEPTACHLOR	0.2	0.1	7				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
LPEST	HEPTACHLOR EPOXIDE	0.2	0.1	7				UG/KG
LPEST	HEXACHLOROBENZENE	0.2	0.1	7				UG/KG
LPEST	METHOXYCHLOR	1	0.7	3				UG/KG
LPEST	MIREX	0.2	0.1	7				UG/KG
LPEST	OXYCHLORDANE	0.4	0.2	0.9				UG/KG
LPEST	PCB-101 (2,2',3,5,5')	0.2	0.1	7				UG/KG
LPEST	PCB-105 (2,3,3',4,4')	0.2	0.1	7				UG/KG
LPEST	PCB-114 (2,3,4,4',5)	0.4	0.2	0.9				UG/KG
LPEST	PCB-118 (2,3',4,4',5)	0.2	0.1	7				UG/KG
LPEST	PCB-123 (2',3,4,4',5)	0.4	0.2	0.9				UG/KG
LPEST	PCB-126 (3,3',4,4',5)	0.2	0.1	7				UG/KG
LPEST	PCB-128 (2,2',3,3',4,4')	0.2	0.1	7				UG/KG
LPEST	PCB-138 (2,2',3,4,4',5')	0.2	0.1	7				UG/KG
LPEST	PCB-153 (2,2',4,4',5,5')	0.2	0.1	7				UG/KG
LPEST	PCB-156 (2,3,3',4,4',5)	0.4	0.2	0.9				UG/KG
LPEST	PCB-157 (2,3,3',4,4',5')	0.4	0.2	0.9				UG/KG
LPEST	PCB-167 (2,3',4,4',5,5')	0.4	0.2	0.9				UG/KG
LPEST	PCB-169 (3,3',4,4',5,5')	0.4	0.2	0.9				UG/KG
LPEST	PCB-170 (2,2',3,3',4,4',5)	0.2	0.1	7				UG/KG
LPEST	PCB-18 (2,2',5)	0.2	0.1	7				UG/KG
LPEST	PCB-180 (2,2',3,4,4',5,5')	0.2	0.1	7				UG/KG
LPEST	PCB-187 (2,2',3,4',5,5',6)	0.2	0.1	7				UG/KG
LPEST	PCB-189 (2,3,3',4,4',5,5')	0.4	0.2	0.9				UG/KG
LPEST	PCB-195 (2,2',3,3',4,4',5,6)	0.2	0.1	7				UG/KG
LPEST	PCB-206 (2,2',3,3',4,4',5,5',6	0.4	0.2	0.9				UG/KG
LPEST	PCB-206 (2,2,',3,3',4,4',5,5',	0.185	0.1	7				UG/KG
LPEST	PCB-209 (2,2',3,3',4,4',5,5',6	0.2	0.1	7				UG/KG
LPEST	PCB-28 (2,4,4')	0.2	0.1	7				UG/KG
LPEST	PCB-44 (2,2',3,5')	0.2	0.1	7				UG/KG
LPEST	PCB-52 (2,2',5,5')	0.2	0.1	7				UG/KG
LPEST	PCB-66 (2,3',4,4')	0.2	0.1	7				UG/KG
LPEST	PCB-77 (3,3',4,4')	0.2	0.1	7				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
LPEST	PCB-8 (2,4')	0.2	0.1	7				UG/KG
LPEST	TECHNICAL CHLORDANE	20.5	6	35				UG/KG
LPEST	TOXAPHENE	185	100	450				UG/KG
LPEST	TRANS-NONACHLOR	0.2	0.1	7				UG/KG
LSVOA	1,1'-BIPHENYL	180	34	22000				UG/KG
LSVOA	1,2,4-TRICHLOROBENZENE	180	34	22000				UG/KG
LSVOA	1,2-DICHLOROBENZENE	180	34	22000				UG/KG
LSVOA	1,3-DICHLOROBENZENE	180	34	22000				UG/KG
LSVOA	1,4-DICHLOROBENZENE	180	34	22000				UG/KG
LSVOA	1-METHYLNAPHTHALENE	180	34	22000				UG/KG
LSVOA	1-METHYLPHENANTHRENE	180	34	22000				UG/KG
LSVOA	2,2'-OXYBIS(1-CHLOROPROPANE	180	34	22000				UG/KG
LSVOA	2,3,5-TRIMETHYLNAPHTHALENE	180	34	22000				UG/KG
LSVOA	2,4,5-TRICHLOROPHENOL	450	86	53000				UG/KG
LSVOA	2,4,6-TRICHLOROPHENOL	180	34	22000				UG/KG
LSVOA	2,4-DICHLOROPHENOL	180	34	22000				UG/KG
LSVOA	2,4-DIMETHYLPHENOL	180	34	22000				UG/KG
LSVOA	2,4-DINITROPHENOL	440	86	53000				UG/KG
LSVOA	2,4-DINITROTOLUENE	180	34	22000				UG/KG
LSVOA	2,6-DIMETHYLNAPHTHALENE	180	34	22000				UG/KG
LSVOA	2,6-DINITROTOLUENE	180	34	22000				UG/KG
LSVOA	2-CHLORONAPHTHALENE	180	34	22000				UG/KG
LSVOA	2-CHLOROPHENOL	180	34	22000				UG/KG
LSVOA	2-METHYLNAPHTHALENE	180	34	22000				UG/KG
LSVOA	2-METHYLPHENOL	180	34	22000				UG/KG
LSVOA	2-NITROANILINE	450	86	53000				UG/KG
LSVOA	2-NITROPHENOL	180	34	22000				UG/KG
LSVOA	3,3'-DICHLOROBENZIDINE	180	34	22000				UG/KG
LSVOA	3-NITROANILINE	450	86	53000				UG/KG
LSVOA	4,6-DINITRO-2-METHYLPHENOL	440	86	53000				UG/KG
LSVOA	4-BROMOPHENYL-PHENYLETHE	180	34	22000				UG/KG
LSVOA	4-CHLORO-3-METHYLPHENOL	180	34	22000				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
LSVOA	4-CHLOROANILINE	180	34	22000				UG/KG
LSVOA	4-CHLOROPHENYL-PHENYLETHE	180	34	22000				UG/KG
LSVOA	4-METHYLPHENOL	180	34	22000				UG/KG
LSVOA	4-NITROANILINE	450	86	53000				UG/KG
LSVOA	4-NITROPHENOL	460	86	53000				UG/KG
LSVOA	ACENAPHTHENE	180	34	22000	16	500	26.6	UG/KG
LSVOA	ACENAPHTHYLENE	180	34	22000				UG/KG
LSVOA	ANTHRACENE	180	34	22000				UG/KG
LSVOA	BENZO(A)ANTHRACENE	180	34	22000				UG/KG
LSVOA	BENZO(A)PYRENE	180	34	22000				UG/KG
LSVOA	BENZO(B)FLUORANTHENE	180	34	22000				UG/KG
LSVOA	BENZO(E)PYRENE	180	34	22000				UG/KG
LSVOA	BENZO(G,H,I)PERYLENE	180	34	22000				UG/KG
LSVOA	BENZO(K)FLUORANTHENE	180	34	22000				UG/KG
LSVOA	BENZOIC ACID	450	86	53000				UG/KG
LSVOA	BENZYL ALCOHOL	180	34	22000				UG/KG
LSVOA	BIS(2-CHLOROETHOXY)METHAN	180	34	22000				UG/KG
LSVOA	BIS(2-CHLOROETHYL)ETHER	180	34	22000				UG/KG
LSVOA	BIS(2-ETHYLHEXYL)PHTHALATE	180	34	22000				UG/KG
LSVOA	BUTYLBENZYLPHTHALATE	180	34	22000				UG/KG
LSVOA	CARBAZOLE	180	34	22000				UG/KG
LSVOA	CHRYSENE	180	34	22000				UG/KG
LSVOA	DI-N-BUTYLPHTHALATE	180	34	22000				UG/KG
LSVOA	DI-N-OCTYLPHTHALATE	180	34	22000				UG/KG
LSVOA	DIBENZ(A,H)ANTHRACENE	180	34	22000				UG/KG
LSVOA	DIBENZOFURAN	180	34	22000				UG/KG
LSVOA	DIBENZOTHIOPHENE	180	34	22000				UG/KG
LSVOA	DIETHYLPHTHALATE	180	34	22000				UG/KG
LSVOA	DIMETHYLPHTHALATE	180	34	22000				UG/KG
LSVOA	FLUORANTHENE	180	34	22000				UG/KG
LSVOA	FLUORENE	180	34	22000	19	540	25.3	UG/KG
LSVOA	HEXACHLOROBENZENE	180	34	22000				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
LSVOA	HEXACHLOROBUTADIENE	180	34	22000				UG/KG
LSVOA	HEXACHLOROCYCLOPENTADIEN	170	34	22000				UG/KG
LSVOA	HEXACHLOROETHANE	180	34	22000				UG/KG
LSVOA	INDENO(1,2,3-CD)PYRENE	180	34	22000				UG/KG
LSVOA	ISOPHORONE	180	34	22000				UG/KG
LSVOA	N-NITROSO-DI-N-PROPYLAMINE	180	34	22000				UG/KG
LSVOA	N-NITROSODIPHENYLAMINE (1)	180	34	22000				UG/KG
LSVOA	NAPHTHALENE	180	34	22000				UG/KG
LSVOA	NITROBENZENE	180	34	22000				UG/KG
LSVOA	PENTACHLOROPHENOL	445	86	53000				UG/KG
LSVOA	PERYLENE	180	34	22000				UG/KG
LSVOA	PHENANTHRENE	180	34	22000				UG/KG
LSVOA	PHENOL	180	34	22000				UG/KG
LSVOA	PYRENE	180	34	22000				UG/KG
PEST	4,4'-DDD	6.3	3.5	73	2.0	20	NA	UG/KG
PEST	4,4'-DDE	6.3	3.5	73	2.0	27	NA	UG/KG
PEST	4,4'-DDT	6.3	3.5	73	2.2	46.1	7	UG/KG
PEST	ALDRIN	3.1	1.8	36				UG/KG
PEST	ALPHA-BHC	3.1	1.8	36				UG/KG
PEST	ALPHA-CHLORDANE	3.1	1.8	36				UG/KG
PEST	AROCLOR-1016	63	20	730				UG/KG
PEST	AROCLOR-1221	130	20	1500				UG/KG
PEST	AROCLOR-1232	63	20	730				UG/KG
PEST	AROCLOR-1242	63	20	730				UG/KG
PEST	AROCLOR-1248	63	20	730				UG/KG
PEST	AROCLOR-1254	63	20	730				UG/KG
PEST	AROCLOR-1260	63	20	730				UG/KG
PEST	BETA-BHC	3.1	1.8	36				UG/KG
PEST	DELTA-BHC	3.1	1.8	36				UG/KG
PEST	DIELDRIN	6.3	3.5	73	0.02	8	0.44	UG/KG
PEST	ENDOSULFAN I	3.1	1.8	36				UG/KG
PEST	ENDOSULFAN II	6.3	3.5	73				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
PEST	ENDOSULFAN SULFATE	6.3	3.5	73				UG/KG
PEST	ENDRIN	6.3	3.5	73	0.02	45	NA	UG/KG
PEST	ENDRIN ALDEHYDE	6.3	3.5	73				UG/KG
PEST	ENDRIN KETONE	6.3	3.5	73				UG/KG
PEST	GAMMA-BHC (LINDANE)	3.1	1.8	36				UG/KG
PEST	GAMMA-CHLORDANE	3.1	1.8	36				UG/KG
PEST	HEPTACHLOR	3.1	1.8	36				UG/KG
PEST	HEPTACHLOR EPOXIDE	3.1	0.4	36				UG/KG
PEST	METHOXYCHLOR	31	18	360				UG/KG
PEST	TOXAPHENE	310	120	3600				UG/KG
SULFIDE	SULFIDE	12.5	0.5	264				MG/KG
SVOA	1,2,4-TRICHLOROBENZENE	640	330	20000				UG/KG
SVOA	1,2-DICHLOROBENZENE	595	320	20000				UG/KG
SVOA	1,3-DICHLOROBENZENE	595	320	20000				UG/KG
SVOA	1,4-DICHLOROBENZENE	595	320	20000				UG/KG
SVOA	2,2'-OXYBIS(1-CHLOROPROPANE	640	330	20000				UG/KG
SVOA	2,4,5-TRICHLOROPHENOL	1600	800	50000				UG/KG
SVOA	2,4,6-TRICHLOROPHENOL	650	330	20000				UG/KG
SVOA	2,4-DICHLOROPHENOL	650	330	20000				UG/KG
SVOA	2,4-DIMETHYLPHENOL	650	330	20000				UG/KG
SVOA	2,4-DINITROPHENOL	1600	800	50000				UG/KG
SVOA	2,4-DINITROTOLUENE	640	330	20000				UG/KG
SVOA	2,6-DINITROTOLUENE	640	330	20000				UG/KG
SVOA	2-CHLORONAPHTHALENE	640	330	20000				UG/KG
SVOA	2-CHLOROPHENOL	650	330	20000				UG/KG
SVOA	2-METHYLNAPHTHALENE	640	330	20000	70	670	19.4	UG/KG
SVOA	2-METHYLPHENOL	650	330	20000				UG/KG
SVOA	2-NITROANILINE	1600	800	50000				UG/KG
SVOA	2-NITROPHENOL	650	330	20000				UG/KG
SVOA	3,3'-DICHLOROBENZIDINE	640	330	20000				UG/KG
SVOA	3-NITROANILINE	1600	800	50000				UG/KG
SVOA	4,6-DINITRO-2-METHYLPHENOL	1600	800	50000				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
SVOA	4-BROMOPHENYL-PHENYLETHE	640	330	20000				UG/KG
SVOA	4-CHLORO-3-METHYLPHENOL	650	330	20000				UG/KG
SVOA	4-CHLOROANILINE	640	330	20000				UG/KG
SVOA	4-CHLOROPHENYL-PHENYLETHE	640	330	20000				UG/KG
SVOA	4-METHYLPHENOL	650	330	20000				UG/KG
SVOA	4-NITROANILINE	1600	800	50000				UG/KG
SVOA	4-NITROPHENOL	1650	800	50000				UG/KG
SVOA	ACENAPHTHENE	640	330	20000	16	500	26.6	UG/KG
SVOA	ACENAPHTHYLENE	640	330	20000	44	640	31.7	UG/KG
SVOA	ANTHRACENE	640	330	20000	85.3	1100	88	UG/KG
SVOA	BENZO(A)ANTHRACENE	640	330	20000	261	1600	244	UG/KG
SVOA	BENZO(A)PYRENE	640	330	20000				UG/KG
SVOA	BENZO(B)FLUORANTHENE	640	330	20000				UG/KG
SVOA	BENZO(G,H,I)PERYLENE	640	330	20000				UG/KG
SVOA	BENZO(K)FLUORANTHENE	640	330	20000				UG/KG
SVOA	BIS(2-CHLOROETHOXY)METHAN	640	330	20000				UG/KG
SVOA	BIS(2-CHLOROETHYL)ETHER	640	330	20000				UG/KG
SVOA	BIS(2-ETHYLHEXYL)PHTHALATE	550	260	20000				UG/KG
SVOA	BUTYLBENZYLPHTHALATE	640	330	20000				UG/KG
SVOA	CARBAZOLE	640	330	20000				UG/KG
SVOA	CHRYSENE	640	330	20000				UG/KG
SVOA	DI-N-BUTYLPHTHALATE	640	330	20000				UG/KG
SVOA	DI-N-OCTYLPHTHALATE	640	330	20000				UG/KG
SVOA	DIBENZ(A,H)ANTHRACENE	640	330	20000	63.4	260	32.7	UG/KG
SVOA	DIBENZOFURAN	640	330	20000				UG/KG
SVOA	DIETHYLPHTHALATE	640	330	20000				UG/KG
SVOA	DIMETHYLPHTHALATE	640	330	20000				UG/KG
SVOA	FLUORANTHENE	640	330	20000				UG/KG
SVOA	FLUORENE	640	330	20000	19	540	25.3	UG/KG
SVOA	HEXACHLOROBENZENE	640	330	20000				UG/KG
SVOA	HEXACHLOROBUTADIENE	640	330	20000				UG/KG
SVOA	HEXACHLOROCYCLOPENTADIEN	640	330	20000				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
SVOA	HEXACHLOROETHANE	640	330	20000				UG/KG
SVOA	INDENO(1,2,3-CD)PYRENE	640	330	20000				UG/KG
SVOA	ISOPHORONE	640	330	20000				UG/KG
SVOA	N-NITROSO-DI-N-PROPYLAMINE	640	330	20000				UG/KG
SVOA	N-NITROSODIPHENYLAMINE (1)	640	330	20000				UG/KG
SVOA	NAPHTHALENE	640	330	20000	160	2100	55.8	UG/KG
SVOA	NITROBENZENE	640	330	20000				UG/KG
SVOA	PENTACHLOROPHENOL	1600	800	50000				UG/KG
SVOA	PHENANTHRENE	640	330	20000	240	1500	237	UG/KG
SVOA	PHENOL	630	330	20000				UG/KG
SVOA	PYRENE	640	330	20000				UG/KG
TMETAL	ALUMINUM	4.4	0.8	67.8				MG/KG
TMETAL	ANTIMONY	0.585	0.35	5.6				MG/KG
TMETAL	ARSENIC	0.75	0.3	7.5				MG/KG
TMETAL	BARIUM	0.09	0.06	15.1				MG/KG
TMETAL	BERYLLIUM	0.03	0.0099	0.61				MG/KG
TMETAL	CADMIUM	0.051	0.02	0.61				MG/KG
TMETAL	CALCIUM	4.2	2.5	325				MG/KG
TMETAL	CHROMIUM	0.48	0.089	2.8				MG/KG
TMETAL	COBALT	0.14	0.08	3.4				MG/KG
TMETAL	COPPER	0.22	0.11	5.6				MG/KG
TMETAL	IRON	4.3	1.8	52.7				MG/KG
TMETAL	LEAD	0.41	0.17	4.3				MG/KG
TMETAL	MAGNESIUM	4.7	1.1	97				MG/KG
TMETAL	MANGANESE	0.16	0.02	1.2				MG/KG
TMETAL	MERCURY	0.06	0.014	0.39				MG/KG
TMETAL	MOLYBDENUM	0.25	0.13	3.2				MG/KG
TMETAL	NICKEL	0.88	0.13	5.1				MG/KG
TMETAL	POTASSIUM	9	4.7	557				MG/KG
TMETAL	SELENIUM	0.92	0.45	5.8				MG/KG
TMETAL	SILVER	0.17	0.11	2.3				MG/KG
TMETAL	SODIUM	36.5	18.2	550				MG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
TMETAL	THALLIUM	0.55	0.077	4.7				MG/KG
TMETAL	VANADIUM	0.17	0.09	5.3				MG/KG
TMETAL	ZINC	0.09	0.06	6.3				MG/KG
TOC	TOTAL ORGANIC CARBON	100	100	135				MG/KG
TPHEXT	DIESEL	18	12	1400				MG/KG
TPHEXT	MOTOR OIL	18	12	1400				MG/KG
TPHPRG	GASOLINE	0.63	0.59	5.6				MG/KG
VOA	1,1,1-TRICHLOROETHANE	18	11	140				UG/KG
VOA	1,1,2,2-TETRACHLOROETHANE	18	11	140				UG/KG
VOA	1,1,2-TRICHLOROETHANE	18	11	140				UG/KG
VOA	1,1-DICHLOROETHANE	18	11	140				UG/KG
VOA	1,1-DICHLOROETHENE	18	11	140				UG/KG
VOA	1,2-DICHLOROETHANE	18	11	140				UG/KG
VOA	1,2-DICHLOROETHENE (TOTAL)	18	11	140				UG/KG
VOA	1,2-DICHLOROPROPANE	18	11	140				UG/KG
VOA	2-BUTANONE	18	11	140				UG/KG
VOA	2-HEXANONE	18	11	140				UG/KG
VOA	4-METHYL-2-PENTANONE	18	11	140				UG/KG
VOA	ACETONE	18	11	140				UG/KG
VOA	BENZENE	18	11	140				UG/KG
VOA	BROMODICHLOROMETHANE	18	11	140				UG/KG
VOA	BROMOFORM	18	11	140				UG/KG
VOA	BROMOMETHANE	18	11	140				UG/KG
VOA	CARBON DISULFIDE	18	11	140				UG/KG
VOA	CARBON TETRACHLORIDE	18	11	140				UG/KG
VOA	CHLOROBENZENE	18	11	140				UG/KG
VOA	CHLOROETHANE	18	11	140				UG/KG
VOA	CHLOROFORM	18	11	140				UG/KG
VOA	CHLOROMETHANE	18	11	140				UG/KG
VOA	CIS-1,3-DICHLOROPROPENE	18	11	140				UG/KG
VOA	DIBROMOCHLOROMETHANE	18	11	140				UG/KG
VOA	ETHYLBENZENE	18	11	140				UG/KG

TABLE P-1
DETECTION LIMITS FOR SOIL AND SEDIMENT ANALYSIS

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	ER-L[2]	ER-M[3]	AMBIENT[4]	UNIT
VOA	METHYLENE CHLORIDE	18	11	140				UG/KG
VOA	STYRENE	18	11	140				UG/KG
VOA	TETRACHLOROETHENE	18	11	140				UG/KG
VOA	TOLUENE	18	11	140				UG/KG
VOA	TRANS-1,3-DICHLOROPROPENE	18	11	140				UG/KG
VOA	TRICHLOROETHENE	18	11	140				UG/KG
VOA	VINYL CHLORIDE	18	11	140				UG/KG
VOA	XYLENE (TOTAL)	18	11	140				UG/KG

Notes:

AROMV - Aromatic volatiles
1 BHC - Hexachlorocyclohexane
CLP - Contract Laboratory Program
DDD - Dichlorodiphenyldchloroethane
DDE - Dichlorodiphenyldichloroethene
DDT - Dichlorodiphenyltrichloroethane
HMX - Cyclotetramethylene tetranitramine
HPCDD Heptachlorodibenzo-p-dioxin
HPCDF - Heptachlorodibenzofuran
HXCDD - Hexachlorodibeno-p-dioxin
HXCDF - Hexachlorodibenzofuran
LDL - Low detection limit
LPEST - Low level pesticides
LSVOA - Low level semivolatile organic analysis
NA - Not available
OCDD - Octachlorodibenzo-p-dioxin
OCDF - Octachlorodibenzofuran
PECDD - Polychlorinated dibenzodioxins
PECDF - polychlorinated dibenzofurans
PEST/PCB - Pesticides and PCBs
PTHPRG - purgeable total petroleum hydrocarbons
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine
SVOA - Semivolatile organic analysis
TCDD - Tetrachlorodibenzo-p-dioxin
TCDF - Tetrachlorodibenzofuran
TMETAL - Total metals
TPHEXT - Extractable total petroleum hydrocarbons
VOA - Volatile organic analysis

2 ER-L - Effects range low (Long and others 1995)
3 ER-M - Effects range median (Long and others 1995)
4 Ambient - The higher value of the San Francisco Bay ambient (RWQCB 1998) or Tidal Area ambient values
Screening values are only listed where detection limits exceed at least one screening value
Shaded analytes have median detection limits greater than one or more screening values

TABLE P-2
DETECTION LIMITS FOR WET-ACID ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	DETECTION LIMIT RANGE	AWQC[2]	UNIT
W-A METAL	ALUMINUM	16.3	6.3 - 16.3		UG/L
W-A METAL	ANTIMONY	2.1	1.9 - 10.5		UG/L
W-A METAL	ARSENIC	2.8	1.4 - 2.8		UG/L
W-A METAL	BARIUM	0.3	0.3 - 3.2		UG/L
W-A METAL	BERYLLIUM	0.1	0.069 - 0.1		UG/L
W-A METAL	CADMIUM	0.2	0.1 - 0.2		UG/L
W-A METAL	CALCIUM	14.4	11.9 - 74.5		UG/L
W-A METAL	CHROMIUM	1.8	1 - 1.8		UG/L
W-A METAL	COBALT	0.5	0.4 - 0.8		UG/L
W-A METAL	COPPER	0.8	0.5 - 1.1		UG/L
W-A METAL	IRON	15.7	10.1 - 243		UG/L
W-A METAL	LEAD	1.5	1.3 - 1.7		UG/L
W-A METAL	MAGNESIUM	16.4	5.1 - 68.7		UG/L
W-A METAL	MANGANESE	0.6	0.2 - 3		UG/L
W-A METAL	MERCURY	0.1	0.08 - 0.1	0.025	UG/L
W-A METAL	MOLYBDENUM	0.9	0.8 - 4.5		UG/L
W-A METAL	NICKEL	3.3	1.3 - 3.3		UG/L
W-A METAL	POTASSIUM	38.65	27.8 - 602		UG/L
W-A METAL	SELENIUM	3.4	3.4 - 34		UG/L
W-A METAL	SILVER	0.6	0.5 - 3	0.022	UG/L
W-A METAL	SODIUM	128	128 - 2590		UG/L
W-A METAL	THALLIUM	2.75	1.5 - 10		UG/L
W-A METAL	VANADIUM	0.6	0.6 - 1.1		UG/L
W-A METAL	ZINC	0.3	0.3 - 8		UG/L

1 W-A = WET-Acid Analysis

2 AWQC - Ambient Water Quality Criteria (see Table 5-2)

Shaded analytes have median detection limits greater than one or more screening values. AWQC are only shown for analytes that the detection limit is higher than the AWQC.

TABLE P-3
DETECTION LIMITS FOR WET-DI ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	DETECTION LIMIT RANGE	AWQC[2]	UNIT
W-DI METAL	ALUMINUM	16.3	6.3 - 16.3		UG/L
W-DI METAL	ANTIMONY	2.1	1.9 - 10.5		UG/L
W-DI METAL	ARSENIC	2.8	1.4 - 2.8		UG/L
W-DI METAL	BARIUM	0.3	0.3 - 3.2		UG/L
W-DI METAL	BERYLLIUM	0.1	0.069 - 0.1		UG/L
W-DI METAL	CADMIUM	0.2	0.1 - 0.2		UG/L
W-DI METAL	CALCIUM	14.4	11.9 - 74.6		UG/L
W-DI METAL	CHROMIUM	1.8	1 - 1.8		UG/L
W-DI METAL	COBALT	0.5	0.4 - 0.8		UG/L
W-DI METAL	COPPER	0.8	0.5 - 1.1		UG/L
W-DI METAL	IRON	15.7	10.1 - 24.3		UG/L
W-DI METAL	LEAD	1.5	1.3 - 1.7		UG/L
W-DI METAL	MAGNESIUM	16.4	5.1 - 68.8		UG/L
W-DI METAL	MANGANESE	0.6	0.2 - 0.6		UG/L
W-DI METAL	MERCURY	0.1	0.08 - 0.1	0.025	UG/L
W-DI METAL	MOLYBDENUM	0.9	0.8 - 1.7		UG/L
W-DI METAL	NICKEL	3.3	1.3 - 3.3		UG/L
W-DI METAL	POTASSIUM	27.8	27.8 - 602		UG/L
W-DI METAL	SELENIUM	3.4	3 - 3.5		UG/L
W-DI METAL	SILVER	0.6	0.5 - 1.5	0.022	UG/L
W-DI METAL	SODIUM	128	128 - 2600		UG/L
W-DI METAL	THALLIUM	2	0.5 - 10		UG/L
W-DI METAL	VANADIUM	0.6	0.6 - 1.1		UG/L
W-DI METAL	ZINC	0.3	0.3 - 0.8		UG/L

1 W-DI = WET-Deionized Water Analysis

2 AWQC - Ambient Water Quality Criteria (see Table 5-2)

Shaded analytes have median detection limits greater than one or more screening values. AWQC are only shown for analytes that the detection limit is higher than the AWQC.

TABLE P-4
DETECTION LIMITS FOR SURFACE WATER ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	AWQC[2]	UNIT
EXPLOSIVE	1,3,5-TRINITROBENZENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	1,3-DINITROBENZENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	2,4,6-TRINITROTOLUENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	2,4-DINITROTOLUENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	2,6-DINITROTOLUENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	2-NITROTOLUENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	3-NITROTOLUENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	4-NITROTOLUENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	HMX	0.13	0.1	0.13		UG/L
EXPLOSIVE	NITROBENZENE	0.13	0.1	0.13		UG/L
EXPLOSIVE	RDX	0.13	0.1	0.13		UG/L
EXPLOSIVE	TETRYL	0.13	0.1	0.13		UG/L
LPEST	4,4'-DDD	0.1	0.1	0.1		UG/L
LPEST	4,4'-DDE	0.1	0.1	0.1		UG/L
LPEST	4,4'-DDT	0.1	0.1	0.1	0.001	UG/L
LPEST	ALDRIN	0.05	0.05	0.05		UG/L
LPEST	ALPHA-BHC	0.05	0.05	0.05		UG/L
LPEST	ALPHA-CHLORDANE	0.05	0.05	0.05		UG/L
LPEST	AROCLOR-1016	0.5	0.5	0.5	0.014	UG/L
LPEST	AROCLOR-1221	1	1	1	0.014	UG/L
LPEST	AROCLOR-1232	0.5	0.5	0.5	0.014	UG/L
LPEST	AROCLOR-1242	0.5	0.5	0.5	0.014	UG/L
LPEST	AROCLOR-1248	0.5	0.5	0.5	0.014	UG/L
LPEST	AROCLOR-1254	0.5	0.5	0.5	0.014	UG/L
LPEST	AROCLOR-1260	0.5	0.5	0.5	0.014	UG/L
LPEST	BETA-BHC	0.05	0.05	0.05		UG/L
LPEST	DELTA-BHC	0.05	0.05	0.05		UG/L
LPEST	DIELDRIN	0.1	0.1	0.1	0.0019	UG/L
LPEST	ENDOSULFAN I	0.05	0.05	0.05	0.0087	UG/L
LPEST	ENDOSULFAN II	0.1	0.1	0.1	0.0087	UG/L

TABLE P-4
DETECTION LIMITS FOR SURFACE WATER ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	AWQC[2]	UNIT
LPEST	ENDOSULFAN SULFATE	0.1	0.1	0.1		UG/L
LPEST	ENDRIN	0.1	0.1	0.1	0.0023	UG/L
LPEST	ENDRIN ALDEHYDE	0.1	0.1	0.1		UG/L
LPEST	ENDRIN KETONE	0.1	0.1	0.1		UG/L
LPEST	GAMMA-BHC (LINDANE)	0.05	0.05	0.05	0.016	UG/L
LPEST	GAMMA-CHLORDANE	0.05	0.05	0.05		UG/L
LPEST	HEPTACHLOR	0.01	0.01	0.01	0.0036	UG/L
LPEST	HEPTACHLOR EPOXIDE	0.01	0.01	0.01	0.0036	UG/L
LPEST	METHOXYCHLOR	0.5	0.5	0.5	0.03	UG/L
LPEST	TOXAPHENE	3	3	3		UG/L
PEST	4,4'-DDD	0.1	0.1	0.5		UG/L
PEST	4,4'-DDE	0.1	0.1	0.5		UG/L
PEST	4,4'-DDT	0.1	0.1	0.5	0.001	UG/L
PEST	ALDRIN	0.05	0.05	0.25		UG/L
PEST	ALPHA-BHC	0.05	0.05	0.25		UG/L
PEST	ALPHA-CHLORDANE	0.05	0.05	0.25		UG/L
PEST	AROCLOR-1016	0.5	0.5	2.5	0.014	UG/L
PEST	AROCLOR-1221	0.5	0.5	2.5	0.014	UG/L
PEST	AROCLOR-1232	0.5	0.5	2.5	0.014	UG/L
PEST	AROCLOR-1242	0.5	0.5	2.5	0.014	UG/L
PEST	AROCLOR-1248	0.5	0.5	2.5	0.014	UG/L
PEST	AROCLOR-1254	0.5	0.5	2.5	0.014	UG/L
PEST	AROCLOR-1260	0.5	0.5	2.5	0.014	UG/L
PEST	BETA-BHC	0.05	0.05	0.25		UG/L
PEST	DELTA-BHC	0.05	0.05	0.25		UG/L
PEST	DIELDRIN	0.1	0.1	0.5	0.0019	UG/L
PEST	ENDOSULFAN I	0.05	0.05	0.25	0.0087	UG/L
PEST	ENDOSULFAN II	0.1	0.1	0.5	0.0087	UG/L
PEST	ENDOSULFAN SULFATE	0.1	0.1	0.5		UG/L
PEST	ENDRIN	0.1	0.1	0.5	0.0023	UG/L

TABLE P-4
DETECTION LIMITS FOR SURFACE WATER ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	AWQC[2]	UNIT
PEST	ENDRIN ALDEHYDE	0.1	0.1	0.5		UG/L
PEST	ENDRIN KETONE	0.1	0.1	0.5		UG/L
PEST	GAMMA-BHC (LINDANE)	0.05	0.05	0.25	0.016	UG/L
PEST	GAMMA-CHLORDANE	0.05	0.05	0.25		UG/L
PEST	HEPTACHLOR	0.05	0.01	0.25	0.0036	UG/L
PEST	HEPTACHLOR EPOXIDE	0.01	0.01	0.05	0.0036	UG/L
PEST	METHOXYCHLOR	0.5	0.5	2.5	0.03	UG/L
PEST	TOXAPHENE	3	3	15		UG/L
SULFIDE	SULFIDE	0.1	0.1	0.2		MG/L
SVOA	1,2,4-TRICHLOROBENZENE	10	10	100		UG/L
SVOA	1,2-DICHLOROBENZENE	5	5	50		UG/L
SVOA	1,3-DICHLOROBENZENE	5	5	50		UG/L
SVOA	1,4-DICHLOROBENZENE	5	5	50		UG/L
SVOA	2,2'-OXYBIS(1-CHLOROPROPANE)	10	10	100		UG/L
SVOA	2,4,5-TRICHLOROPHENOL	25	25	250		UG/L
SVOA	2,4,6-TRICHLOROPHENOL	10	10	100		UG/L
SVOA	2,4-DICHLOROPHENOL	10	10	100		UG/L
SVOA	2,4-DIMETHYLPHENOL	10	10	100		UG/L
SVOA	2,4-DINITROPHENOL	25	25	250		UG/L
SVOA	2,4-DINITROTOLUENE	10	10	100		UG/L
SVOA	2,6-DINITROTOLUENE	10	10	100		UG/L
SVOA	2-CHLORONAPHTHALENE	10	10	100		UG/L
SVOA	2-CHLOROPHENOL	10	10	100		UG/L
SVOA	2-METHYLNAPHTHALENE	10	10	100		UG/L
SVOA	2-METHYLPHENOL	10	10	100		UG/L
SVOA	2-NITROANILINE	25	25	250		UG/L
SVOA	2-NITROPHENOL	10	10	100		UG/L
SVOA	3,3'-DICHLOROBENZIDINE	10	10	100		UG/L
SVOA	3-NITROANILINE	25	25	250		UG/L
SVOA	4,6-DINITRO-2-METHYLPHENOL	25	25	250		UG/L

TABLE P-4
DETECTION LIMITS FOR SURFACE WATER ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	AWQC[2]	UNIT
SVOA	4-BROMOPHENYL-PHENYLETHER	10	10	100		UG/L
SVOA	4-CHLORO-3-METHYLPHENOL	10	10	100		UG/L
SVOA	4-CHLOROANILINE	10	10	100		UG/L
SVOA	4-CHLOROPHENYL-PHENYLETHER	10	10	100		UG/L
SVOA	4-METHYLPHENOL	10	10	100		UG/L
SVOA	4-NITROANILINE	25	25	250		UG/L
SVOA	4-NITROPHENOL	25	25	250		UG/L
SVOA	ACENAPHTHENE	10	10	100		UG/L
SVOA	ACENAPHTHYLENE	10	10	100		UG/L
SVOA	ANTHRACENE	10	10	100		UG/L
SVOA	BENZO(A)ANTHRACENE	10	10	100		UG/L
SVOA	BENZO(A)PYRENE	10	10	50		UG/L
SVOA	BENZO(B)FLUORANTHENE	10	10	50		UG/L
SVOA	BENZO(G,H,I)PERYLENE	10	10	50		UG/L
SVOA	BENZO(K)FLUORANTHENE	10	10	50		UG/L
SVOA	BIS(2-CHLOROETHOXY)METHANE	10	10	100		UG/L
SVOA	BIS(2-CHLOROETHYL)ETHER	10	10	100		UG/L
SVOA	BIS(2-ETHYLHEXYL)PHTHALATE	4	4	50		UG/L
SVOA	BUTYLBENZYLPHTHALATE	10	10	100		UG/L
SVOA	CARBAZOLE	10	10	100		UG/L
SVOA	CHRYSENE	10	10	100		UG/L
SVOA	DI-N-BUTYLPHTHALATE	10	10	100		UG/L
SVOA	DI-N-OCTYLPHTHALATE	10	10	50		UG/L
SVOA	DIBENZ(A,H)ANTHRACENE	10	10	50		UG/L
SVOA	DIBENZOFURAN	10	10	100		UG/L
SVOA	DIETHYLPHTHALATE	10	10	100		UG/L
SVOA	DIMETHYLPHTHALATE	10	10	100		UG/L
SVOA	FLUORANTHENE	10	10	100		UG/L
SVOA	FLUORENE	10	10	100		UG/L
SVOA	HEXACHLOROBENZENE	10	10	100		UG/L

TABLE P-4
DETECTION LIMITS FOR SURFACE WATER ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	AWQC[2]	UNIT
SVOA	HEXACHLOROBUTADIENE	10	10	100		UG/L
SVOA	HEXACHLOROCYCLOPENTADIENE	10	10	100		UG/L
SVOA	HEXACHLOROETHANE	10	10	100		UG/L
SVOA	INDENO(1,2,3-CD)PYRENE	10	10	50		UG/L
SVOA	ISOPHORONE	10	10	100		UG/L
SVOA	N-NITROSO-DI-N-PROPYLAMINE	10	10	100		UG/L
SVOA	N-NITROSODIPHENYLAMINE (1)	10	10	100		UG/L
SVOA	NAPHTHALENE	10	10	100		UG/L
SVOA	NITROBENZENE	10	10	100		UG/L
SVOA	PENTACHLOROPHENOL	25	25	250	7.4	UG/L
SVOA	PHENANTHRENE	10	10	100		UG/L
SVOA	PHENOL	10	10	100		UG/L
SVOA	PYRENE	10	10	100		UG/L
TMETAL	ALUMINUM	18.8	1.6	44.4		UG/L
TMETAL	ANTIMONY	2.1	1	8		UG/L
TMETAL	ARSENIC	2.8	0.7	7		UG/L
TMETAL	BARIUM	0.4	0.3	9.9		UG/L
TMETAL	BERYLLIUM	0.1	0.02	0.5		UG/L
TMETAL	CADMIUM	0.2	0.06	1		UG/L
TMETAL	CALCIUM	14.4	8.2	380		UG/L
TMETAL	CHROMIUM	0.5	0.2	2.5		UG/L
TMETAL	COBALT	0.5	0.28	2.2		UG/L
TMETAL	COPPER	0.8	0.2	3.7		UG/L
TMETAL	IRON	13.8	3.6	55		UG/L
TMETAL	LEAD	1.2	0.36	4		UG/L
TMETAL	MAGNESIUM	26.9	16.3	3180		UG/L
TMETAL	MANGANESE	0.3	0.1	0.8		UG/L
TMETAL	MERCURY	0.1	0.1	0.2	0.025	UG/L
TMETAL	MOLYBDENUM	0.9	0.3	3		UG/L
TMETAL	NICKEL	1.3	0.3	3.5		UG/L

TABLE P-4
DETECTION LIMITS FOR SURFACE WATER ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	AWQC[2]	UNIT
TMETAL	POTASSIUM	543	44.4	18900		UG/L
TMETAL	SELENIUM	3.4	0.6	11.5		UG/L
TMETAL	SILVER	0.6	0.26	2.5	0.22	UG/L
TMETAL	SODIUM	128	25.7	16800		UG/L
TMETAL	THALLIUM	1.9	1.3	9.5		UG/L
TMETAL	VANADIUM	0.6	0.3	3.5		UG/L
TMETAL	ZINC	1	0.3	5		UG/L
TOC	TOTAL ORGANIC CARBON	0.5	0.5	2.5		MG/L
TPHEXT	DIESEL	0.1	0.1	1		MG/L
TPHEXT	MOTOR OIL	0.1	0.1	1		MG/L
VOA	1,1,1-TRICHLOROETHANE	10	10	10		UG/L
VOA	1,1,2,2-TETRACHLOROETHANE	10	10	10		UG/L
VOA	1,1,2-TRICHLOROETHANE	10	10	10		UG/L
VOA	1,1-DICHLOROETHANE	10	10	10		UG/L
VOA	1,1-DICHLOROETHENE	10	10	10		UG/L
VOA	1,2-DICHLOROETHANE	10	10	10		UG/L
VOA	1,2-DICHLOROETHENE (TOTAL)	10	10	10		UG/L
VOA	1,2-DICHLOROPROPANE	10	10	10		UG/L
VOA	2-BUTANONE	10	10	10		UG/L
VOA	2-HEXANONE	10	10	10		UG/L
VOA	4-METHYL-2-PENTANONE	10	10	10		UG/L
VOA	ACETONE	10	10	10		UG/L
VOA	BENZENE	10	10	10		UG/L
VOA	BROMODICHLOROMETHANE	10	10	10		UG/L
VOA	BROMOFORM	10	10	10		UG/L
VOA	BROMOMETHANE	10	10	10		UG/L
VOA	CARBON DISULFIDE	10	10	10		UG/L
VOA	CARBON TETRACHLORIDE	10	10	10		UG/L
VOA	CHLOROBENZENE	10	10	10		UG/L
VOA	CHLOROETHANE	10	10	10		UG/L

TABLE P-4
DETECTION LIMITS FOR SURFACE WATER ANALYSES

ANALYTE GROUP[1]	ANALYTE	DETECTION LIMIT MEDIAN	MINIMUM DETECTION LIMIT	MAXIMUM DETECTION LIMIT	AWQC[2]	UNIT
VOA	CHLOROFORM	10	10	10		UG/L
VOA	CHLOROMETHANE	10	10	10		UG/L
VOA	CIS-1,3-DICHLOROPROPENE	10	10	10		UG/L
VOA	DIBROMOCHLOROMETHANE	10	10	10		UG/L
VOA	ETHYLBENZENE	10	10	10		UG/L
VOA	METHYLENE CHLORIDE	10	10	10		UG/L
VOA	STYRENE	10	10	10		UG/L
VOA	TETRACHLOROETHENE	10	10	10		UG/L
VOA	TOLUENE	10	10	10		UG/L
VOA	TRANS-1,3-DICHLOROPROPENE	10	10	10		UG/L
VOA	TRICHLOROETHENE	10	10	10		UG/L
VOA	VINYL CHLORIDE	10	10	10		UG/L
VOA	XYLENE (TOTAL)	10	10	10		UG/L

Notes:

1 BHC - Hexachlorocyclohexane
DDD - Dichlorodiphenyldchloroethane
DDE - Dichlorodiphenyldichloroethene
DDT - Dichlorodiphenyltrichloroethane
HMX - Cyclotetramethylene tetranitramine
LPEST - Low level pesticides
PEST - Pesticides
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine
SVOA - Semivolatile organic analysis
TMETAL - Total metals
TPHEXT - Extractable total petroleum hydrocarbons
VOA - Volatile organic analysis

2 Ambient Water Quality Criteria (see Table 5-2)
AWQC are only listed where detection limits exceed the AWQC
Shaded analytes have median detection limits greater than the AWQC

APPENDIX Q

STATISTICAL EVALUATION FOR OUTLIER AND EXTREME VALUES FOR INORGANIC CONSTITUENTS IN SOIL AND SEDIMENT

ALUMINUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	225	100.0%	0	.0%	225	100.0%

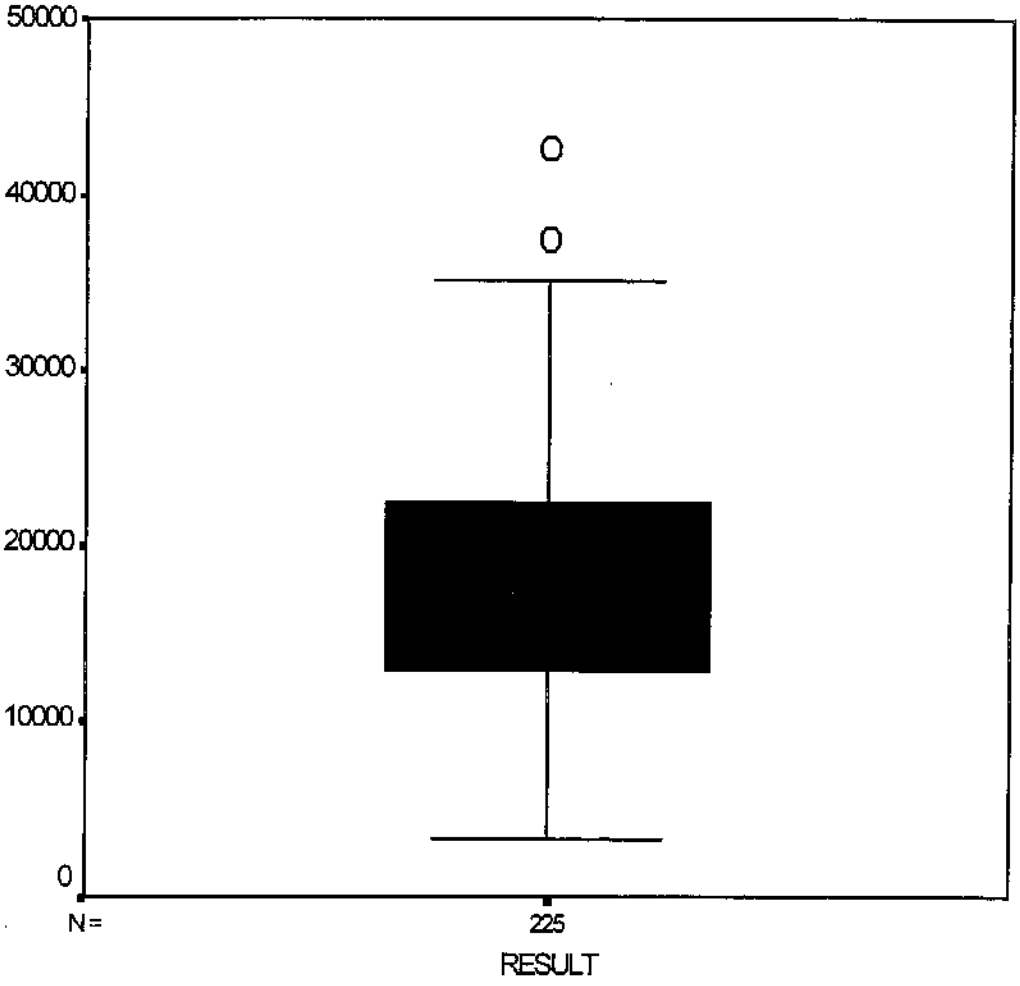
Descriptives

			Statistic	Std. Error
RESULT	Mean		17852.44	481.6889
	95% Confidence Interval for Mean	Lower Bound	16903.22	
		Upper Bound	18801.67	
	5% Trimmed Mean		17637.88	
	Median		16900.00	
	Variance		5.2E+07	
	Std. Deviation		7225.3335	
	Minimum		3340.00	
	Maximum		42700.00	
	Range		39360.00	
	Interquartile Range		9550.0000	
	Skewness		.514	.162
	Kurtosis		.047	.323

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	1	WHSSB001	42700.00
		2	2	FTSSB005	37500.00
		3	3	WHSSL003	35200.00
		4	4	RADSBF05	33700.00
		5	5	RADSBE06	33500.00
	Lowest	1	225	S37-09	3340.00
		2	224	S37-06	3350.00
		3	223	RADSB024	4420.00
		4	222	S37-08	4790.00
		5	221	WHSSB021	5130.00

ALUMINUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
O	SOSA	WHSSB001	42700
O	FTA	FTSSB005	37500

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

ANTIMONY

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	145	100.0%	0	.0%	145	100.0%

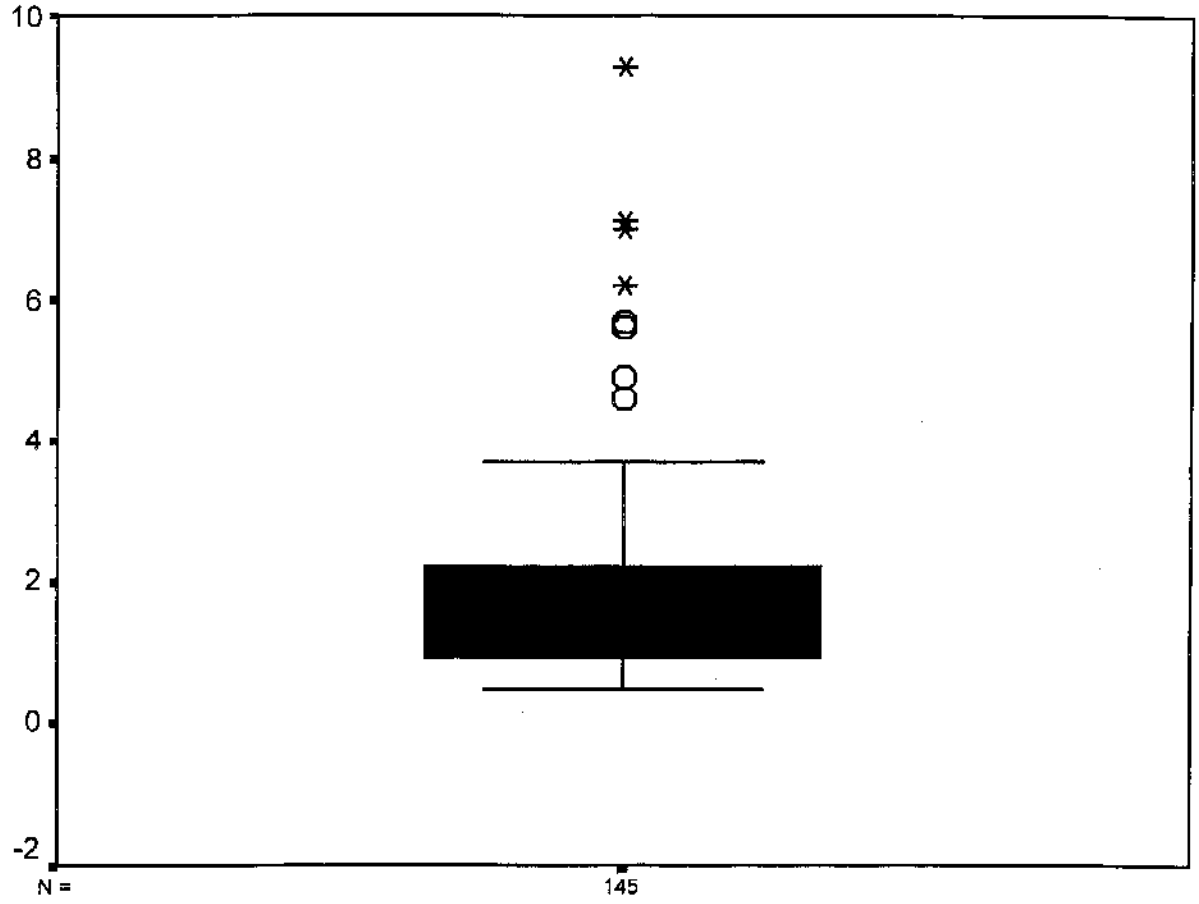
Descriptives

			Statistic	Std. Error
RESULT	Mean		1.8234	.1215
	95% Confidence Interval for Mean	Lower Bound	1.5834	
		Upper Bound	2.0635	
	5% Trimmed Mean		1.6146	
	Median		1.4000	
	Variance		2.139	
	Std. Deviation		1.4626	
	Minimum		.48	
	Maximum		9.30	
	Range		8.82	
	Interquartile Range		1.2600	
	Skewness		2.524	.201
	Kurtosis		7.485	.400

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	229	OSLSL008	9.30
		2	231	WHSSB014	7.10
		3	230	RADSBA07	7.10
		4	232	WHSSB016	7.00
		5	233	WHSSBI02	6.20
	Lowest	1	370	S37-01	.48
		2	369	S37-08	.53
		3	368	RADSBF08	.53
		4	367	WHSSB010	.61
		5	366	RADSBK02	.62

ANTIMONY



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	SOSA	OSLSL008	9.3
*	NOSA	RADSBA07	7.1
*	WHT	WHSSB014	7.1
*	WHT	WHSSB016	7
*	WHT	WHSSBI02	6.2
O	WHT	WHSSBE04	5.7
O	WHT	WHSSBE08	5.7
O	RAT	RADSB008	5.6
O	WHT	WHSSB013	4.9
O	WHT	WHSSBK06	4.6

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

ARSENIC

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	382	TLSSB007	57.60
		2	383	RADSBA07	47.20
		3	384	TLSSB008	42.70
		4	385	RADSBJ04	42.00
		5	386	RADSBH06	40.10
	Lowest	1	591	WHSSB018	1.30
		2	590	WHSSB008	2.00
		3	589	S37-01	3.20
		4	588	WHSSBJ07	3.30
		5	587	WHSSBE02	3.30

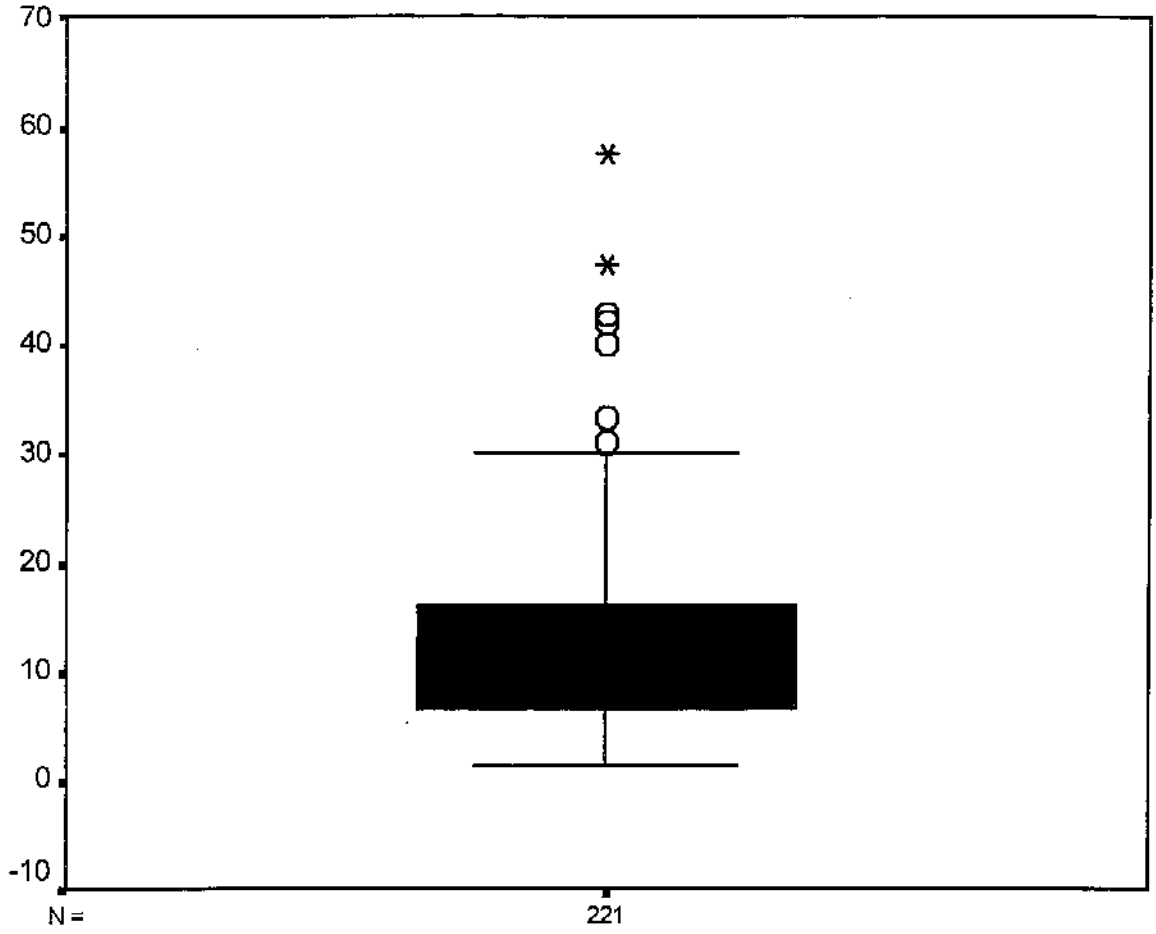
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	221	100.0%	0	.0%	221	100.0%

Descriptives

			Statistic	Std. Error
RESULT	Mean		12.2548	.5545
	95% Confidence Interval for Mean	Lower Bound	11.1620	
		Upper Bound	13.3475	
	5% Trimmed Mean		11.3894	
	Median		10.1000	
	Variance		67.942	
	Std. Deviation		8.2427	
	Minimum		1.30	
	Maximum		57.60	
	Range		56.30	
	Interquartile Range		9.6000	
	Skewness		2.010	.164
	Kurtosis		6.173	.326

ARSENIC



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	LFT	TLSSB007	57.6
*	NOSA	RADSBA07	47.2
O	LFT	TLSSB008	42.7
O	RAT	RADSBJ04	42
O	RAT	RADSBH06	40.1
O	NOSA	RADSB006	33.2
O	RAT	RADSBH07	30.9

* Values more than 3-box-lengths from 75th percentile (extreme values)

0 Values more than 1.5 box-lengths from 75th percentile (outliers)

BARIUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	225	100.0%	0	.0%	225	100.0%

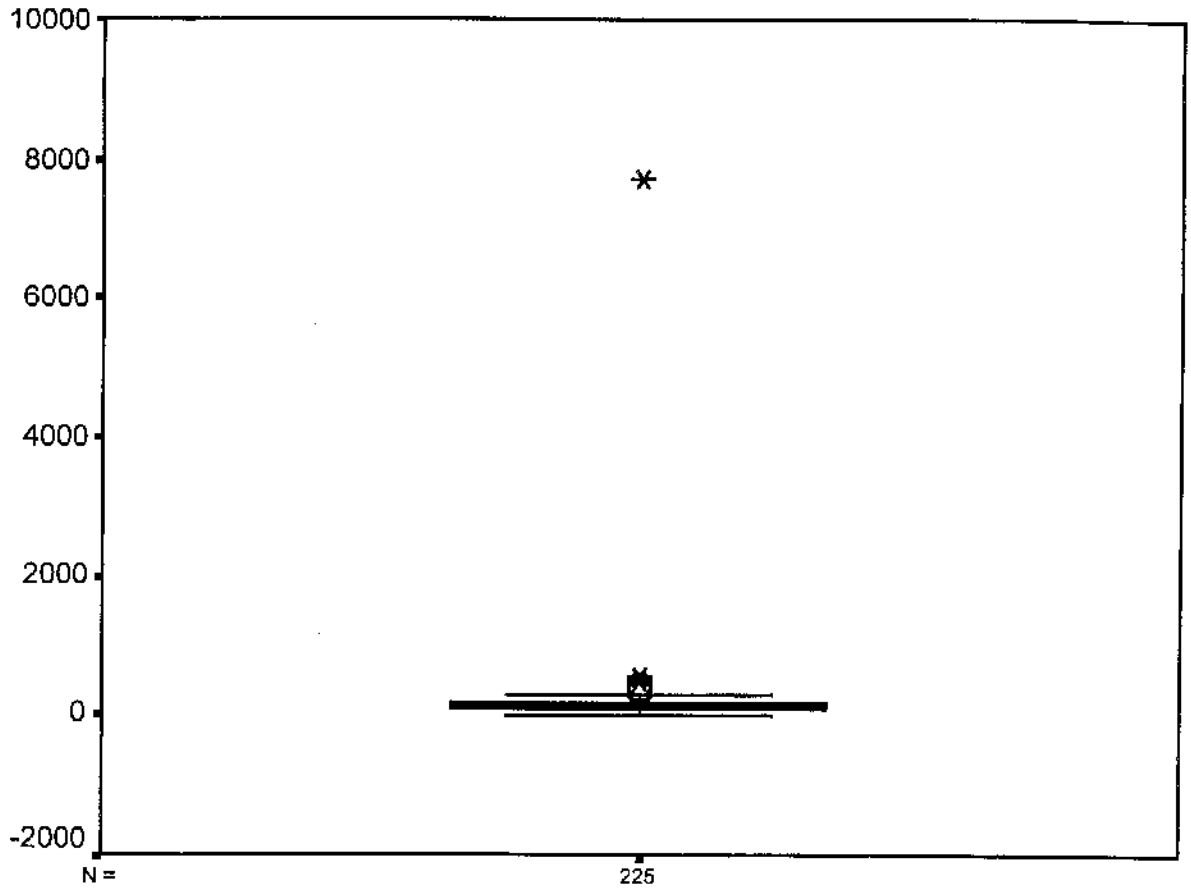
Descriptives

			Statistic	Std. Error
RESULT	Mean		175.6076	34.1338
	95% Confidence Interval for Mean	Lower Bound	108.3432	
		Upper Bound	242.8719	
	5% Trimmed Mean		133.5257	
	Median		122.0000	
	Variance		262150.7	
	Std. Deviation		512.0066	
	Minimum		3.50	
	Maximum		7705.00	
	Range		7701.50	
	Interquartile Range		93.6000	
	Skewness		14.328	.162
	Kurtosis		211.413	.323

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	603	RADSBE07	7705.00
		2	604	WHSSBE08	546.00
		3	605	WHSSBG06	529.00
		4	606	RADSBA08	499.00
		5	607	WHSSBA06	460.00
	Lowest	1	816	S37-03	3.50
		2	815	S37-06	20.30
		3	814	S37-09	22.90
		4	813	WHSSB010	32.10
		5	812	S37-08	34.70

BARIUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	RAT	RADSBE07	7705
*	WHT	WHSSBE08	546
*	WHT	WHSSBG06	529
*	RAT	RADSBA08	499
*	WHT	WHSSBA06	460
O	WHT	S37-10	438
O	LFT	TLSSB004	436
O	RAT	RADSB024	365
O	SOSA	WHSSBD01	353
O	RAT	RADSBI06	347
O	LFT	TLSSB007	340
O	RAT	RADSBI08	318

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

BERYLLIUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	63	100.0%	0	.0%	63	100.0%

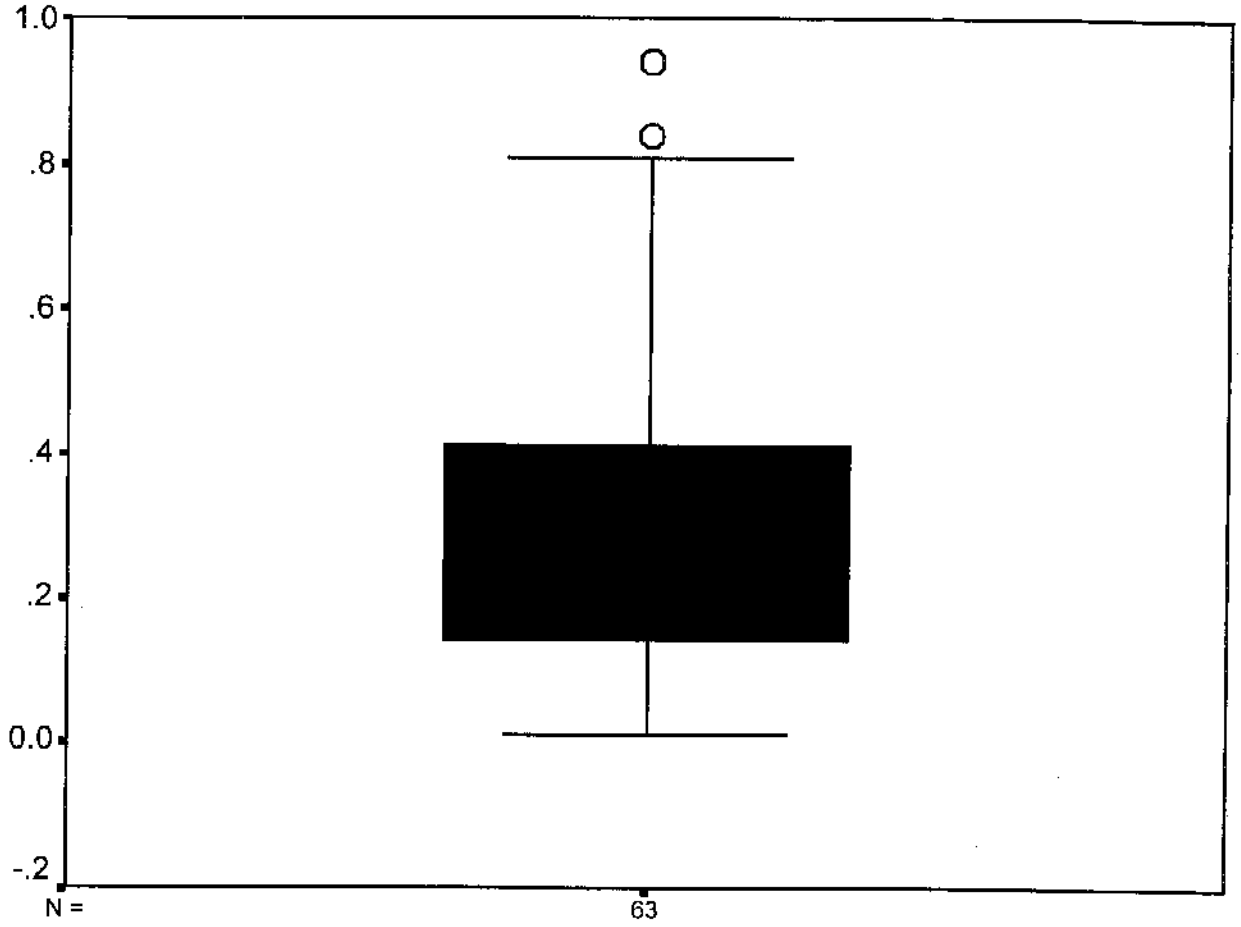
Descriptives

			Statistic	Std. Error
RESULT	Mean		.3168	2.743E-02
	95% Confidence Interval for Mean	Lower Bound	.2620	
		Upper Bound	.3717	
	5% Trimmed Mean		.3016	
	Median		.2300	
	Variance		4.740E-02	
	Std. Deviation		.2177	
	Minimum		.01	
	Maximum		.94	
	Range		.93	
	Interquartile Range		.2700	
	Skewness		1.025	.302
	Kurtosis		.415	.595

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	818	OSLSL008	.94
		2	819	WHSSB001	.84
		3	820	WHSSB002	.81
		4	821	WHSSB003	.78
		5	822	WHSSL003	.72
	Lowest	1	879	WHSSB018	.01
		2	878	WHSSBA08	.06
		3	877	WHSSBF07	.07
		4	876	WHSSBL07	.08
		5	875	WHSSBE06	.08

BERYLLIUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
O	SOSA	OSLSL008	0.94
O	SOSA	WHSSB001	0.84

* Values more than 3-box-lengths from 75th percentile (extreme values)
O Values more than 1.5 box-lengths from 75th percentile (outliers)

CADMIUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	57	100.0%	0	.0%	57	100.0%

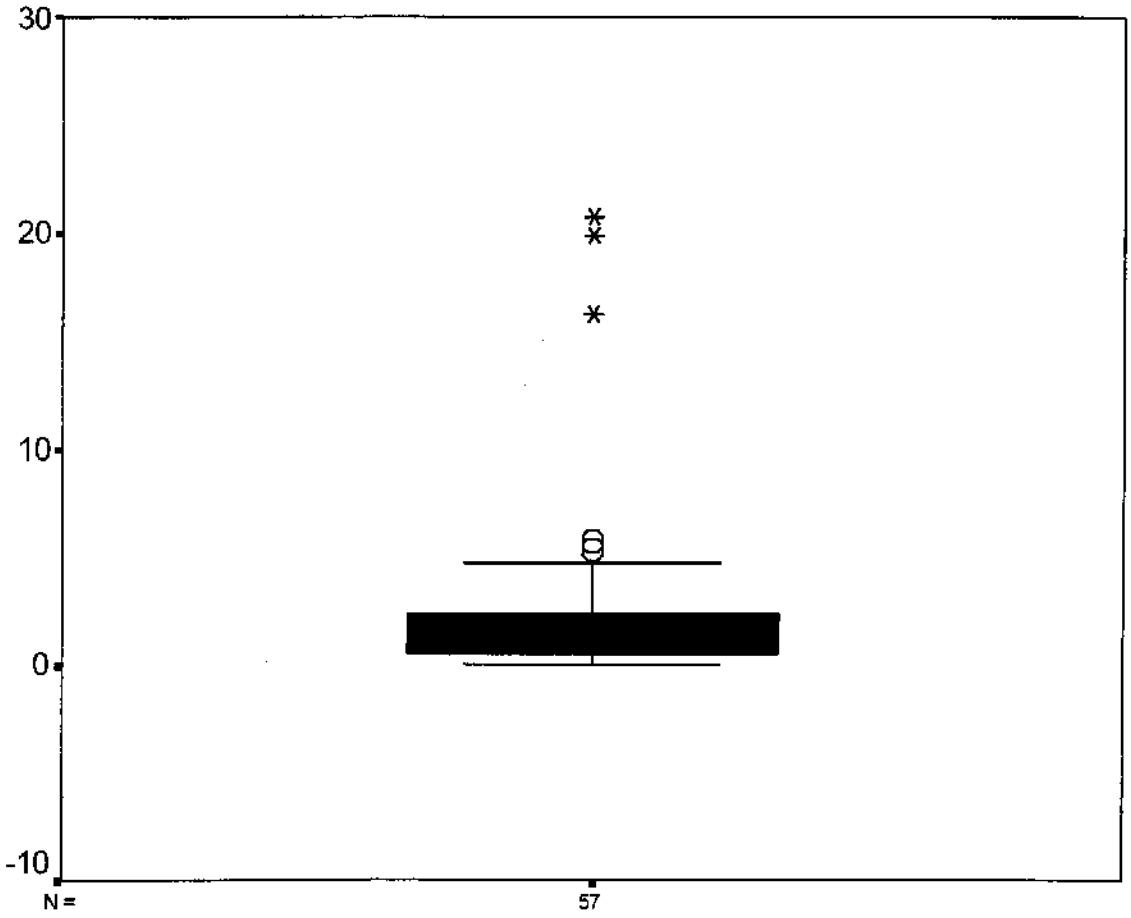
Descriptives

			Statistic	Std. Error
RESULT	Mean		2.3044	.5589
	95% Confidence Interval for Mean	Lower Bound	1.1849	
		Upper Bound	3.4239	
	5% Trimmed Mean		1.4931	
	Median		.8000	
	Variance		17.802	
	Std. Deviation		4.2193	
	Minimum		.05	
	Maximum		20.80	
	Range		20.75	
	Interquartile Range		1.5550	
	Skewness		3.538	.316
	Kurtosis		12.565	.623

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	887	WHSSBI02	20.80
		2	888	WHSSB050	19.90
		3	889	WHSSBE04	16.20
		4	890	TLSSB002	5.80
		5	891	WHSSBH03	5.40
	Lowest	1	936	WHSSB010	.05
		2	935	WHSSB008	.08
		3	934	WHSSB012	.18
		4	933	WHSSBC06	.24
		5	932	WHSSB005	.25

CADMIUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	WHT	WHSSBI02	20.8
*	WHT	WHSSB050	19.9
*	WHT	WHSSBE04	16.2
O	LFT	TLSSB002	5.8
O	WHT	WHSSBH03	5.4
O	WHT	WHSSB009	4.7
O	SOSA	WHSSB002	4.2
O	WHT	WHSSBF03	4.1

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

CHROMIUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	220	100.0%	0	.0%	220	100.0%

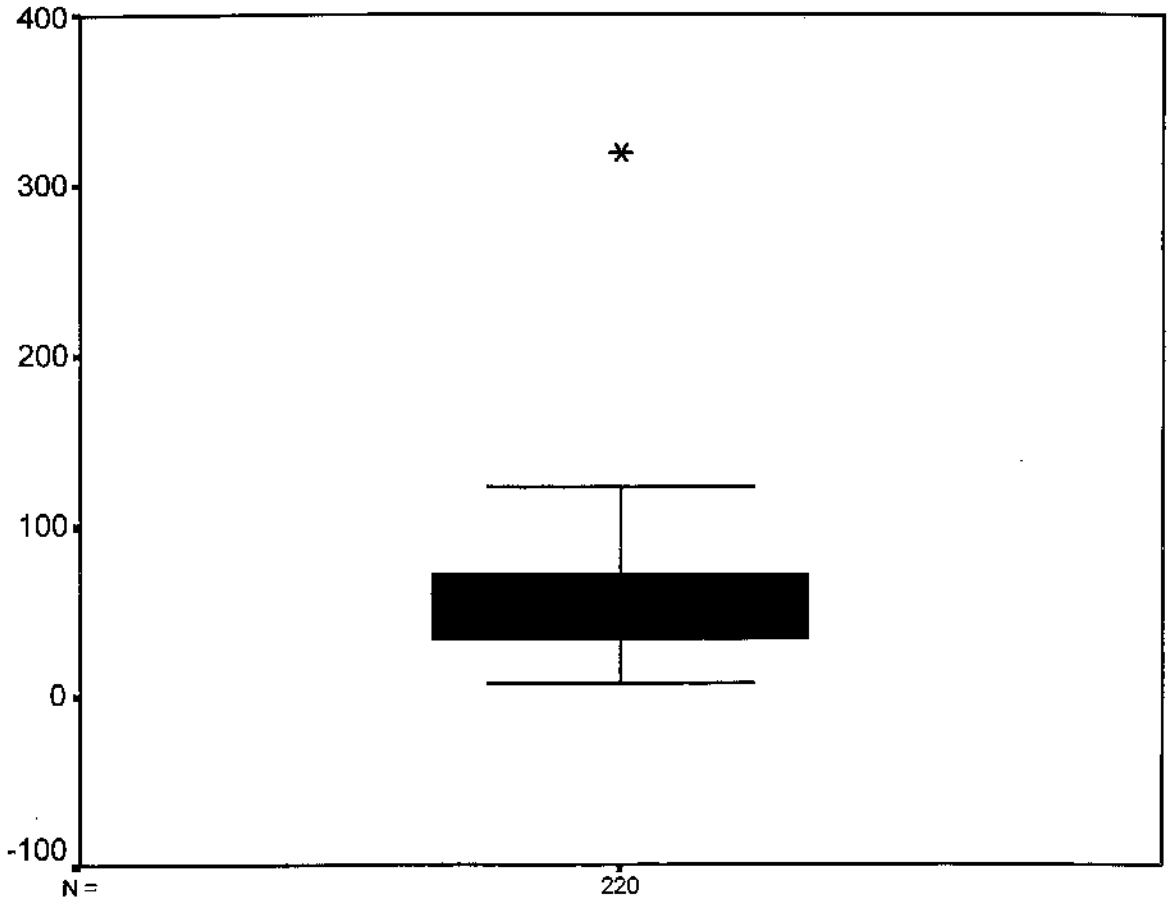
Descriptives

			Statistic	Std. Error
RESULT	Mean		53.0068	1.9906
	95% Confidence Interval for Mean	Lower Bound	49.0836	
		Upper Bound	56.9301	
	5% Trimmed Mean		51.3096	
	Median		49.2000	
	Variance		871.777	
	Std. Deviation		29.5259	
	Minimum		6.40	
	Maximum		319.00	
	Range		312.60	
	Interquartile Range		37.4000	
	Skewness		3.523	.164
	Kurtosis		28.880	.327

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	948	RADSBA07	319.00
		2	949	WHSSB001	122.00
		3	950	WHSSB014	122.00
		4	947	FTSSB005	106.00
		5	951	RADSBE03	101.00
	Lowest	1	1156	S37-09	6.40
		2	1155	S37-06	7.00
		3	1154	S37-08	10.40
		4	1153	S37-02	10.50
		5	1152	S37-07	12.50

CHROMIUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	NOSA	RADSBA07	319

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

COBALT

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	225	100.0%	0	.0%	225	100.0%

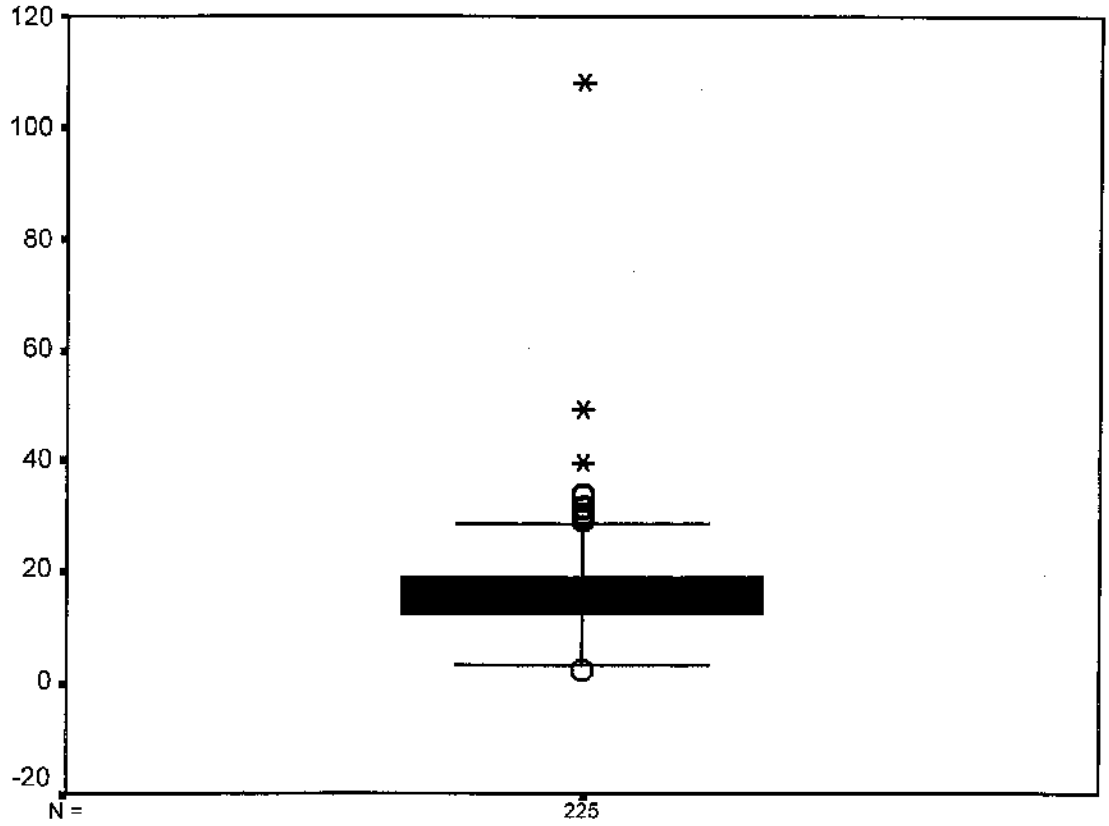
Descriptives

			Statistic	Std. Error
RESULT	Mean		16.2671	.5912
	95% Confidence Interval for Mean	Lower Bound	15.1021	
		Upper Bound	17.4321	
	5% Trimmed Mean		15.5546	
	Median		14.7000	
	Variance		78.637	
	Std. Deviation		8.8677	
	Minimum		2.40	
	Maximum		108.00	
	Range		105.60	
	Interquartile Range		6.5500	
	Skewness		5.387	.162
	Kurtosis		51.180	.323

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	1168	RADSBH06	108.00
		2	1169	RADSBI08	49.10
		3	1170	WHSSB022	39.30
		4	1171	WHSSB003	33.90
		5	1172	TLSSB002	33.50
	Lowest	1	1381	WHSSB021	2.40
		2	1380	S37-06	3.40
		3	1379	S37-07	4.40
		4	1378	S37-08	4.70
		5	1161	FTSSL102	4.70

COBALT



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	RAT	RADSBH06	108
*	RAT	RADSBI08	49.1
*	SOSA	WHSSB022	39.3
O	SOSA	WHSSB003	33.9
O	LFT	TLSSB002	33.5
O	NOSA	RADSB003	31.5
O	RAT	RADSB024	31.2
O	WHT	WHSSB024	30.2
O	LFT	TLSSB008	29.4
O	WHT	S37-10	29.2
O	WHT	WHSSBE08	29.1

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

COPPER

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	222	100.0%	0	.0%	222	100.0%

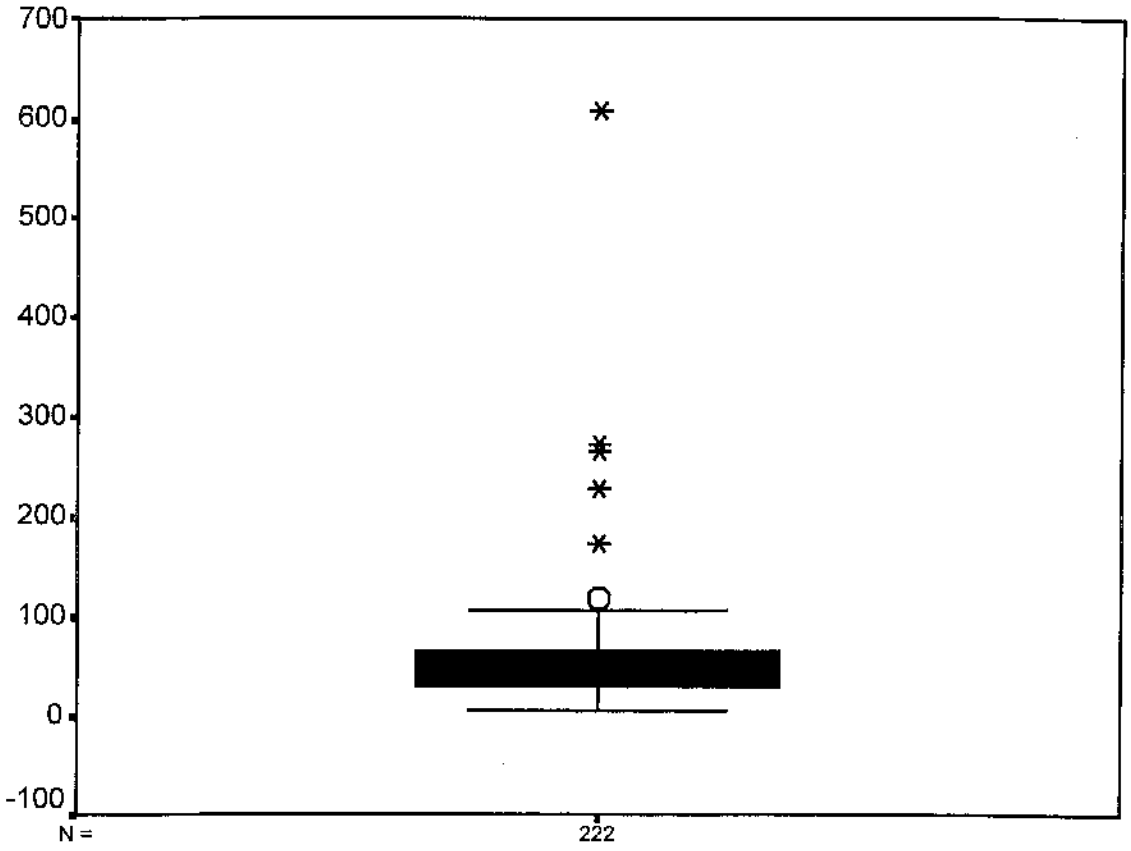
Descriptives

			Statistic	Std. Error
RESULT	Mean		53.5626	3.4007
	95% Confidence Interval for Mean	Lower Bound	46.8607	
		Upper Bound	60.2645	
	5% Trimmed Mean		47.9366	
	Median		44.6000	
	Variance		2567.359	
	Std. Deviation		50.6691	
	Minimum		4.60	
	Maximum		607.00	
	Range		602.40	
	Interquartile Range		34.4500	
	Skewness		6.873	.163
	Kurtosis		67.034	.325

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	1393	WHSSBH03	607.00
		2	1394	RADSBA07	272.00
		3	1395	TLSSB007	264.00
		4	1396	WHSSBI02	228.00
		5	1397	WHSSBE04	173.00
	Lowest	1	1603	S37-06	4.60
		2	1602	S37-09	6.10
		3	1601	WHSSB010	7.60
		4	1600	S37-02	9.20
		5	1599	S37-08	9.90

COPPER



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	WHT	WHSSBH03	607
*	NOSA	RADSBA07	272
*	LFT	TLSSB007	264
*	WHT	WHSSBI02	228
*	WHT	WHSSBE04	173
O	LFT	TLSSB002	117

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

LEAD

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	225	100.0%	0	.0%	225	100.0%

Descriptives

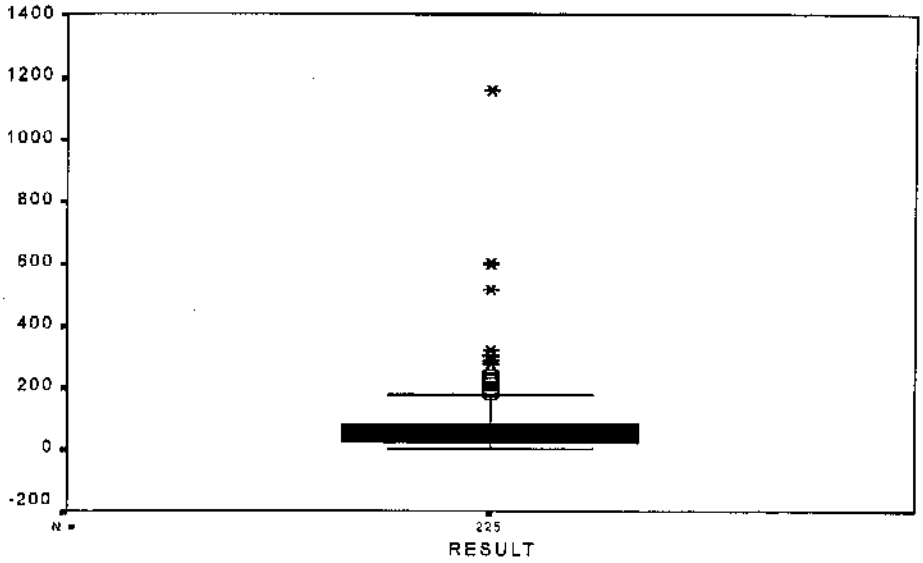
			Statistic	Std. Error
RESULT	Mean		71.3004	7.4146
	95% Confidence Interval for Mean	Lower Bound	56.6892	
		Upper Bound	85.9117	
	5% Trimmed Mean		55.3637	
	Median		40.9000	
	Variance		12369.641	
	Std. Deviation		111.2189	
	Minimum		2.40	
	Maximum		1160.00	
	Range		1157.60	
	Interquartile Range		63.8500	
	Skewness		5.660	.162
	Kurtosis		45.225	.323

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	1615	RADSBG08	1160.00
		2	1616	WHSSB014	598.00
		3	1617	WHSSBE04	593.00
		4	1608	FTSSB002	515.00
		5	1618	WHSSBE08	320.00
	Lowest	1	1828	S37-03	2.40
		2	1827	S37-06	3.10
		3	1826	S37-09	3.30
		4	1825	S37-12	4.90
		5	1823	S37-02	[a]

a. Only a partial list of cases with the value 5 are shown in the table of lower extremes.

LEAD



Extreme Values	Site	Sample Location	Conc. (mg/kg)	Outliers	Site	Sample Location	Conc. (mg/kg)
*	RAT	RADSBG08	1160	O	RAT	RADSBE07	235
*	WHT	WHSSB014	598	O	WHT	WHSSB013	226
*	WHT	WHSSBE04	593	O	WHT	WHSSBD03	218
*	FTA	FTSSB002	515	O	WHT	WHSSB016	211
*	WHT	WHSSBH08	320	O	FTA	FTSSB003	211
*	RAT	RADSB020	300	O	RAT	RADSBF06	208
*	RAT	RADSBI06	285	O	RAT	RADSBJ04	196
*	RAT	RADSB007	275	O	WHT	WHSSBI02	195
				O	RAT	RADSBA08	192
				O	NOSA	RADSBA02	182
				O	RAT	RADSBC05	176
				O	WHT	WHSSBC02	175
				O	RAT	RADSBH05	172
				O	WHT	WHSSB009	167
				O	FTA	FTSSB006	157
				O	LFT	TLSSB007	156
				O	LFT	TLSSB002	152
				O	WHT	WHSSB028	150
				O	FTA	FTSSB009	143
				O	WHT	WHSSB015	142
				O	RAT	RADSBC06	140
				O	WHT	WHSSBH03	134
				O	RAT	RADSB008	132
				O	NOSA	RADSBA01	128

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

MANGANESE

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	225	100.0%	0	.0%	225	100.0%

Descriptives

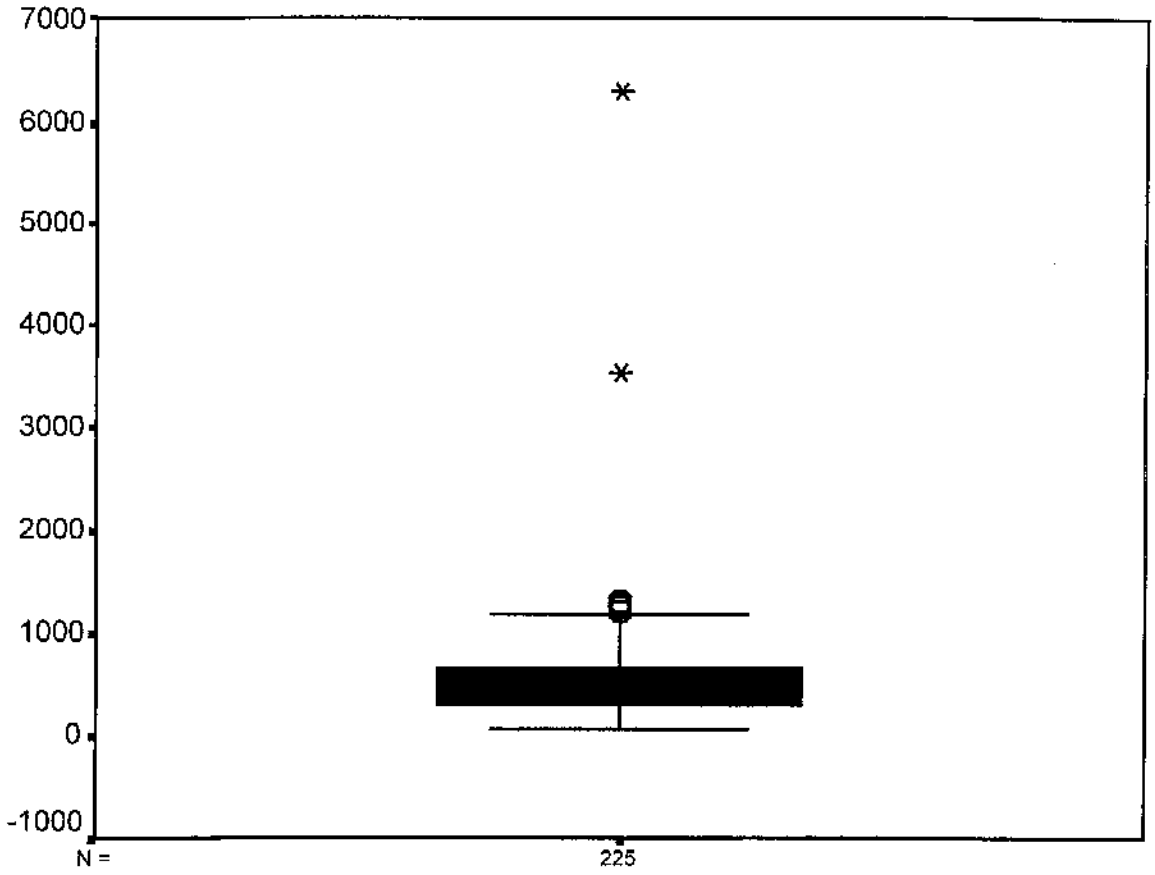
			Statistic	Std. Error
RESULT	Mean		525.9542	33.4195
	95% Confidence Interval for Mean	Lower Bound	460.0974	
		Upper Bound	591.8110	
	5% Trimmed Mean		476.6975	
	Median		433.0000	
	Variance		251293.8	
	Std. Deviation		501.2921	
	Minimum		55.30	
	Maximum		6300.00	
	Range		6244.70	
	Interquartile Range		353.0000	
	Skewness		7.902	.162
	Kurtosis		83.779	.323

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	1840	RADSBI08	6300.00
		2	1832	FTSSL104	3530.00
		3	1841	WHSSB051	1300.00
		4	1842	WHSSB022	1270.00
		5	1843	RADSBD05	1250.00
	Lowest	1	2053	WHSSB021	55.30
		2	2052	RADSBA08	59.00
		3	2051	S37-06	75.10
		4	2050	S37-08	98.30
		5	2049	S37-09	.[a]

a. Only a partial list of cases with the value 123 are shown in the table of lower extremes.

MANGANESE



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	RAT	RADSBI08	6300
*	FTA	FTSSL104	3530
O	WHT	WHSSB051	1300
O	SOSA	WHSSB022	1270
O	RAT	RADSBD05	1250
O	WHT	WHSSBA06	1190

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

MERCURY

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	163	100.0%	0	.0%	163	100.0%

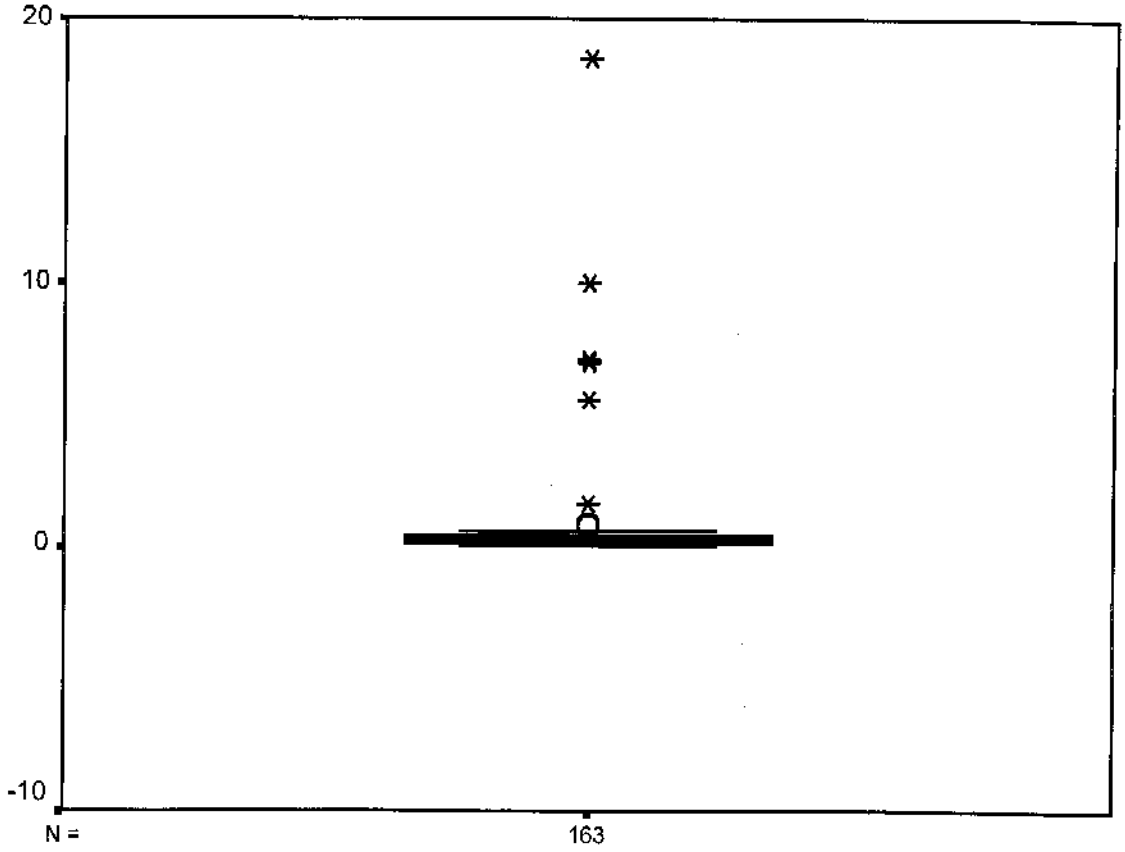
Descriptives

			Statistic	Std. Error
RESULT	Mean		.5482	.1432
	95% Confidence Interval for Mean	Lower Bound	.2654	
		Upper Bound	.8310	
	5% Trimmed Mean		.2541	
	Median		.2200	
	Variance		3.343	
	Std. Deviation		1.8283	
	Minimum		.03	
	Maximum		18.50	
	Range		18.47	
	Interquartile Range		.2500	
	Skewness		7.467	.190
	Kurtosis		63.483	.378

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	2062	WHSSB022	18.50
		2	2063	WHSSB018	10.00
		3	2064	WHSSB024	7.10
		4	2065	WHSSBM06	7.00
		5	2066	WHSSBA06	5.60
	Lowest	1	2216	WHSSB005	.03
		2	2213	RADSBH02	.05
		3	2215	WHSSBJ05	.05
		4	2212	RADSB015	.05
		5	2214	RADSBK01	.05

MERCURY



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	SOSA	WHSSB022	18.5
*	SOSA	WHSSB018	10
*	WHT	WHSSB024	7.1
*	WHT	WHSSBM06	7
*	WHT	WHSSBA06	5.6
*	NOSA	RADSL001	1.6
O	NOSA	RADSBA04	0.92
O	SOSA	WHSSBB05	0.82
O	WHT	WHSSBE04	0.82
O	NOSA	RADSB004	0.79
O	WHT	WHSSBI02	0.79

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

MOLYBDENUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	76	100.0%	0	.0%	76	100.0%

Descriptives

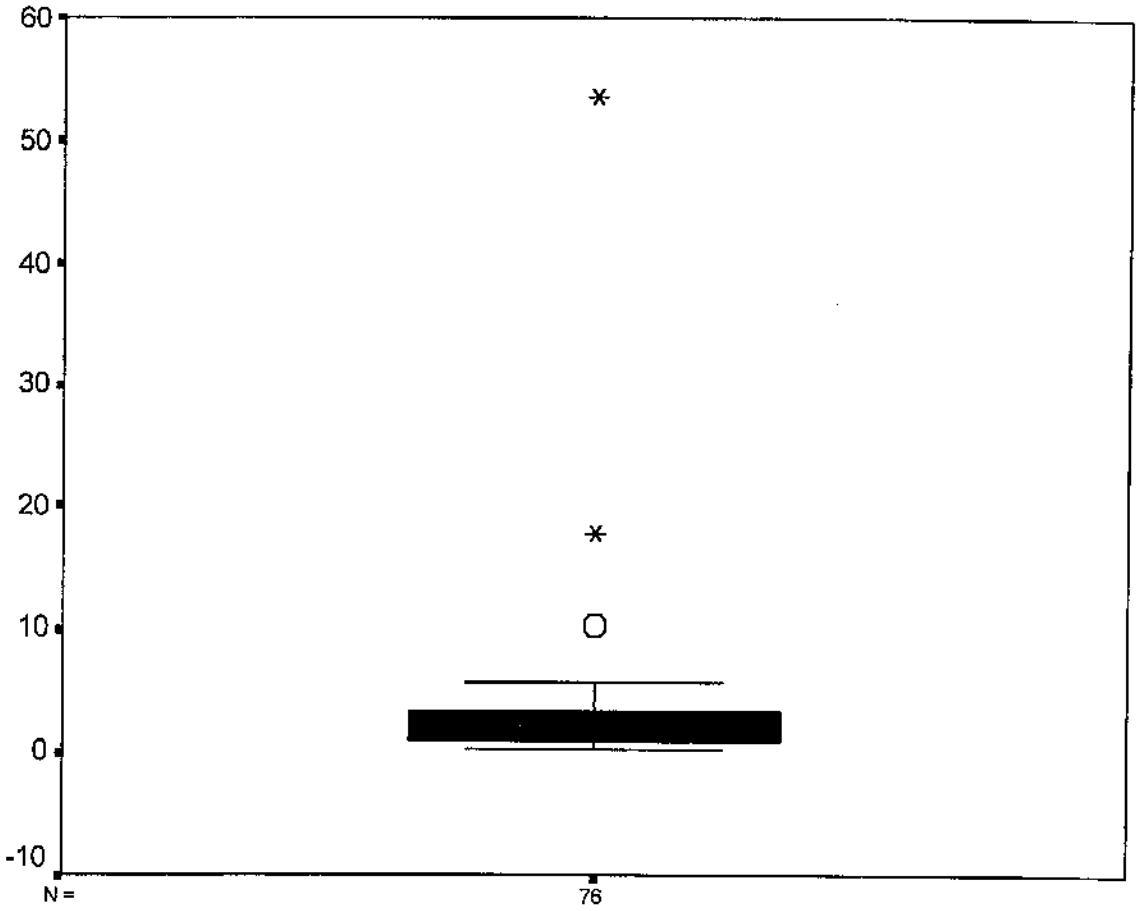
			Statistic	Std. Error
RESULT	Mean		3.1601	.7346
	95% Confidence Interval for Mean	Lower Bound	1.6968	
		Upper Bound	4.6235	
	5% Trimmed Mean		2.2332	
	Median		1.7000	
	Variance		41.010	
	Std. Deviation		6.4039	
	Minimum		.22	
	Maximum		53.70	
	Range		53.48	
	Interquartile Range		2.7450	
	Skewness		6.892	.276
	Kurtosis		53.338	.545

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	2223	RADSBA07	53.70
		2	2224	RADSBH06	17.80
		3	2225	RADSBH07	10.30
		4	2226	RADSBI06	5.70
		5	2228	WHSSBI08	.[a]
	Lowest	1	2222	FTSSL103	.22
		2	2292	WHSSBE06	.25
		3	2291	RADSBE04	.32
		4	2290	WHSSB009	.34
		5	2289	RADSBC06	.37

a. Only a partial list of cases with the value 6 are shown in the table of upper extremes.

MOLYBDENUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	NOSA	RADSBA07	53.7
*	RAT	RADSBH06	17.8
O	RAT	RADSBH07	10.3

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

NICKEL

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	224	100.0%	0	.0%	224	100.0%

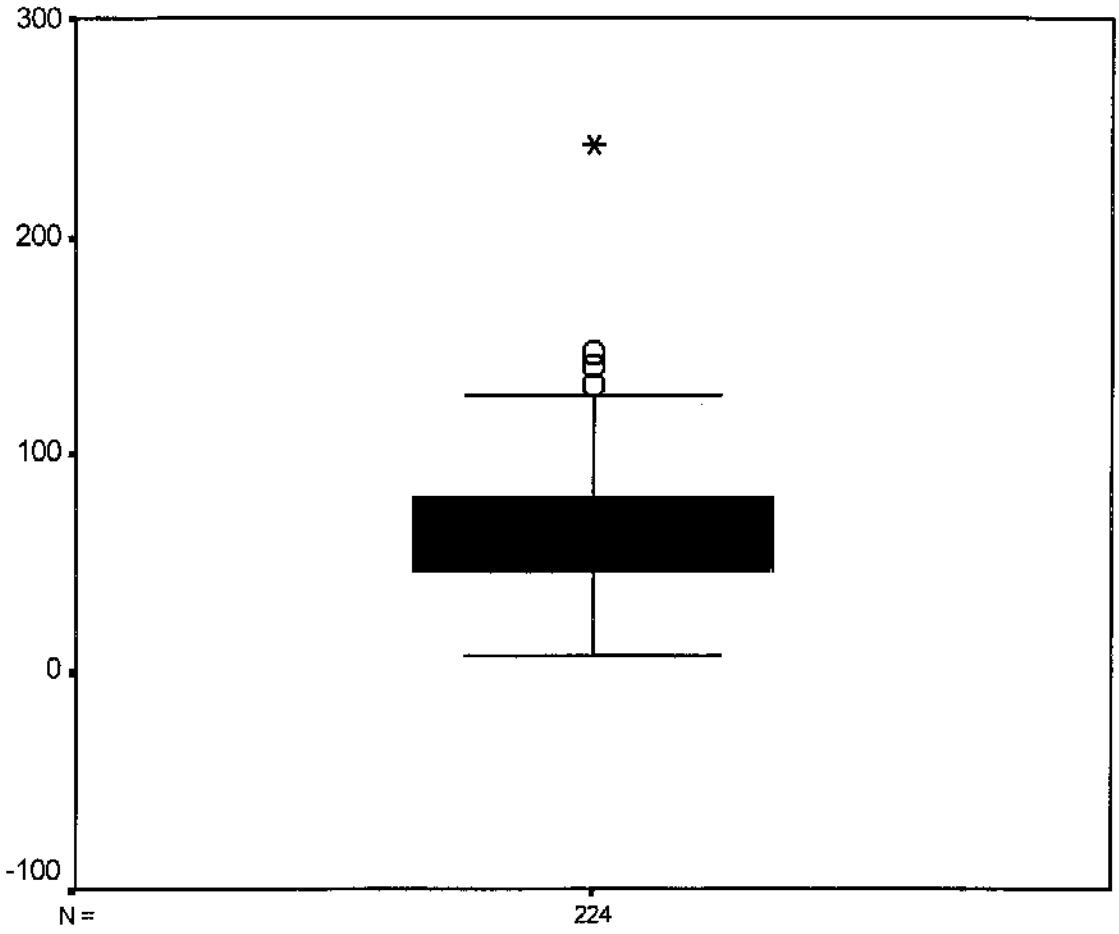
Descriptives

			Statistic	Std. Error
RESULT	Mean		64.3487	1.8968
	95% Confidence Interval for Mean	Lower Bound	60.6106	
		Upper Bound	68.0867	
	5% Trimmed Mean		63.1219	
	Median		65.3000	
	Variance		805.947	
	Std. Deviation		28.3892	
	Minimum		6.30	
	Maximum		242.00	
	Range		235.70	
	Interquartile Range		33.5250	
	Skewness		1.232	.163
	Kurtosis		6.250	.324

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	2304	RADSBH06	242.00
		2	2305	RADSBF06	146.00
		3	2306	RADSBA07	140.00
		4	2307	TLSSB002	131.00
		5	2308	RADSBJ04	126.00
	Lowest	1	2516	S37-09	6.30
		2	2515	S37-08	7.00
		3	2514	S37-02	8.90
		4	2513	S37-03	11.20
		5	2512	S37-07	14.70

NICKEL



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	RAT	RADSBH06	242
O	RAT	RADSBF06	146
O	NOSA	RADSBA07	140
O	LFT	TLSSB002	131

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

SELENIUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	14	100.0%	0	.0%	14	100.0%

Descriptives

			Statistic	Std. Error
RESULT	Mean		1.6121	.3010
	95% Confidence Interval for Mean	Lower Bound	.9618	
		Upper Bound	2.2625	
	5% Trimmed Mean		1.4874	
	Median		1.2500	
	Variance		1.269	
	Std. Deviation		1.1264	
	Minimum		.67	
	Maximum		4.80	
	Range		4.13	
	Interquartile Range		.3500	
	Skewness		2.344	.597
	Kurtosis		5.078	1.154

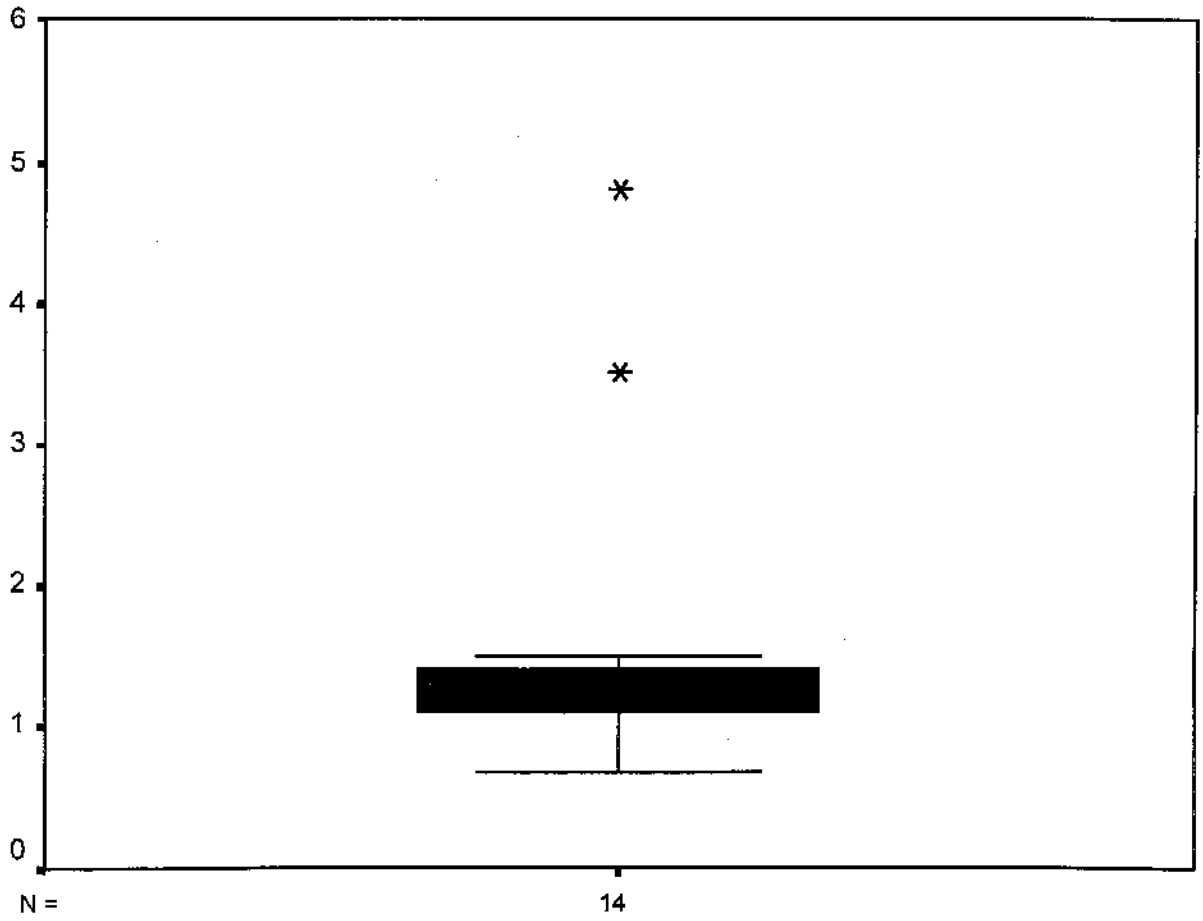
Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	2519	WHSSBC02	4.80
		2	2520	WHSSB001	3.50
		3	2521	OSLSL004	1.50
		4	2517	FTSSL104	1.50
		5	2522	RADSB029	.[a]
	Lowest	1	2530	WHSSBC06	.67
		2	2529	WHSSB015	.90
		3	2528	RADSBL03	1.00
		4	2527	WHSSB013	1.20
		5	2525	OSLSL001	.[b]

a. Only a partial list of cases with the value 1 are shown in the table of upper extremes.

b. Only a partial list of cases with the value 1 are shown in the table of lower extremes.

SELENIUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	WHT	WHSSBC02	4.8
*	SOSA	WHSSB001	3.5

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

SILVER

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	33	100.0%	0	.0%	33	100.0%

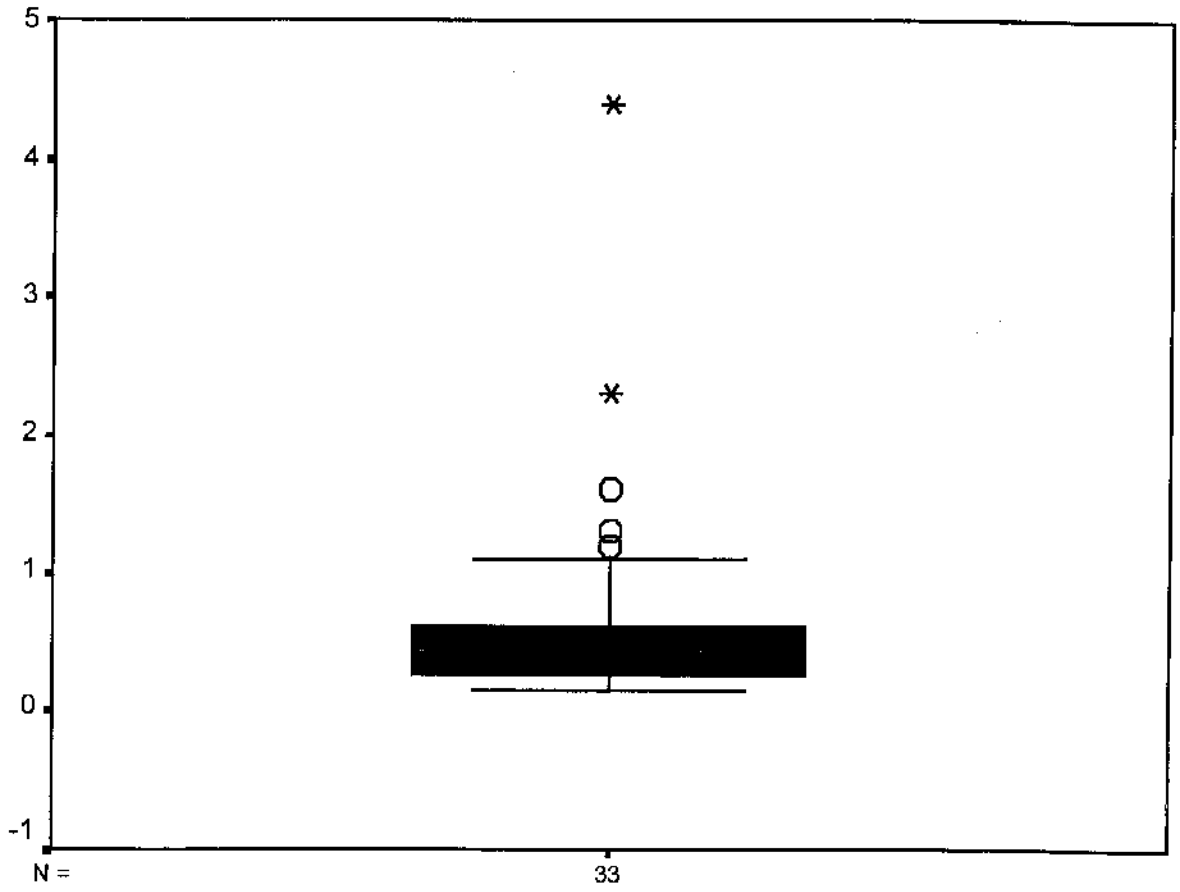
Descriptives

			Statistic	Std. Error
RESULT	Mean		.6688	.1422
	95% Confidence Interval for Mean	Lower Bound	.3791	
		Upper Bound	.9584	
	5% Trimmed Mean		.5361	
	Median		.4000	
	Variance		.667	
	Std. Deviation		.8168	
	Minimum		.15	
	Maximum		4.40	
	Range		4.25	
	Interquartile Range		.3800	
	Skewness		3.437	.409
	Kurtosis		13.843	.798

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	2538	WHSSB013	4.40
		2	2539	WHSSB014	2.30
		3	2540	WHSSB009	1.60
		4	2541	S37-10	1.30
		5	2542	TLSSB007	1.20
	Lowest	1	2537	FTSSL103	.15
		2	2563	WHSSBM08	.16
		3	2536	FTSSB002	.18
		4	2562	WHSSBH03	.18
		5	2561	RADSB008	.21

SILVER



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	WHT	WHSSB013	4.4
*	WHT	WHSSB014	2.3
O	WHT	WHSSB009	1.6
O	WHT	S37-10	1.3
O	LFT	TLSSB007	1.2

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

THALLIUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	32	100.0%	0	.0%	32	100.0%

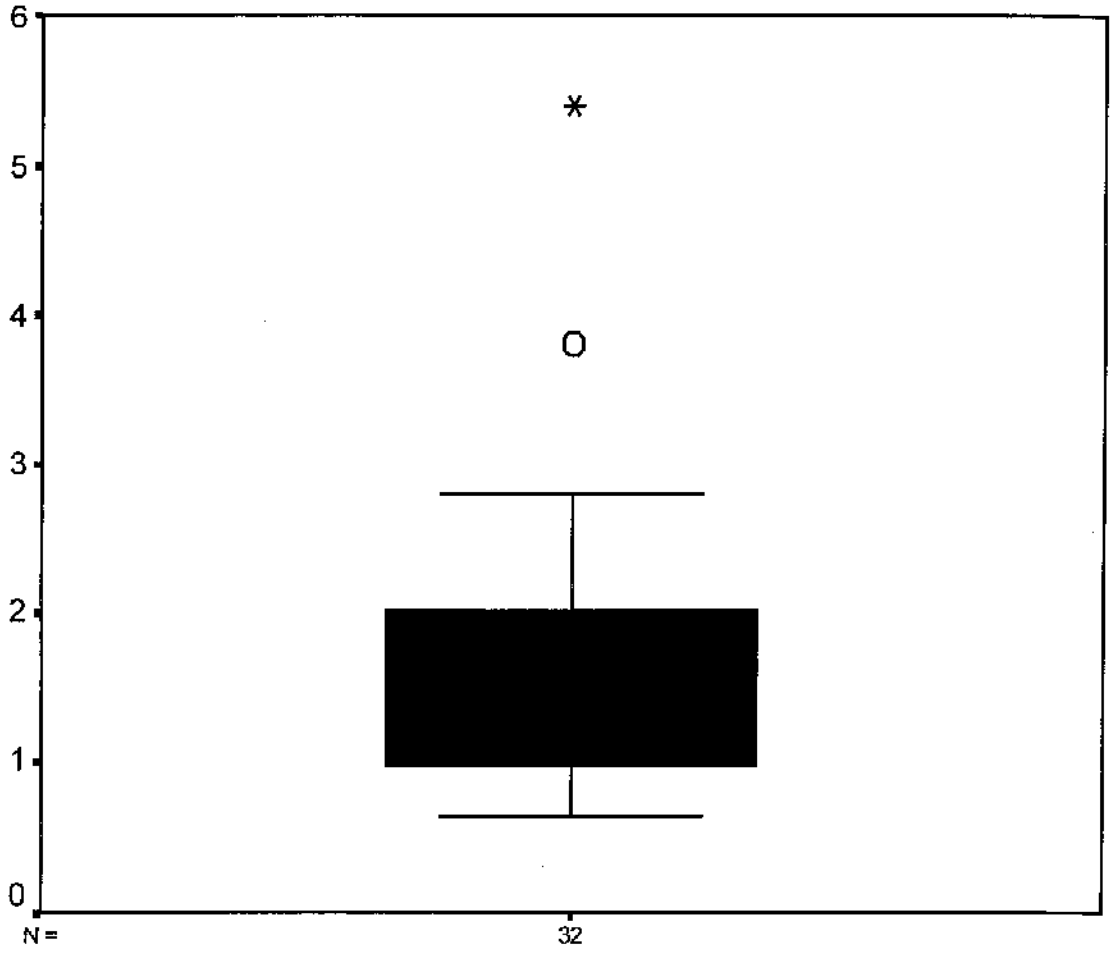
Descriptives

			Statistic	Std. Error
RESULT	Mean		1.6734	.1730
	95% Confidence Interval for Mean	Lower Bound	1.3207	
		Upper Bound	2.0262	
	5% Trimmed Mean		1.5567	
	Median		1.5500	
	Variance		.957	
	Std. Deviation		.9784	
	Minimum		.64	
	Maximum		5.40	
	Range		4.76	
	Interquartile Range		1.0300	
	Skewness		2.106	.414
	Kurtosis		6.147	.809

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	2567	RADSBI08	5.40
		2	2564	FTSSL104	3.80
		3	2568	OSLSL007	2.80
		4	2569	RADSBC05	2.40
		5	2570	WHSSBD03	2.40
	Lowest	1	2595	FTSSB001	.64
		2	2594	RADSB009	.66
		3	2593	WHSSBH07	.69
		4	2592	RADSBC03	.72
		5	2591	RADSB007	.92

THALLIUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	RAT	RADSBI08	5.4
O	FTA	FTSSL104	3.8

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

VANADIUM

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	225	100.0%	0	.0%	225	100.0%

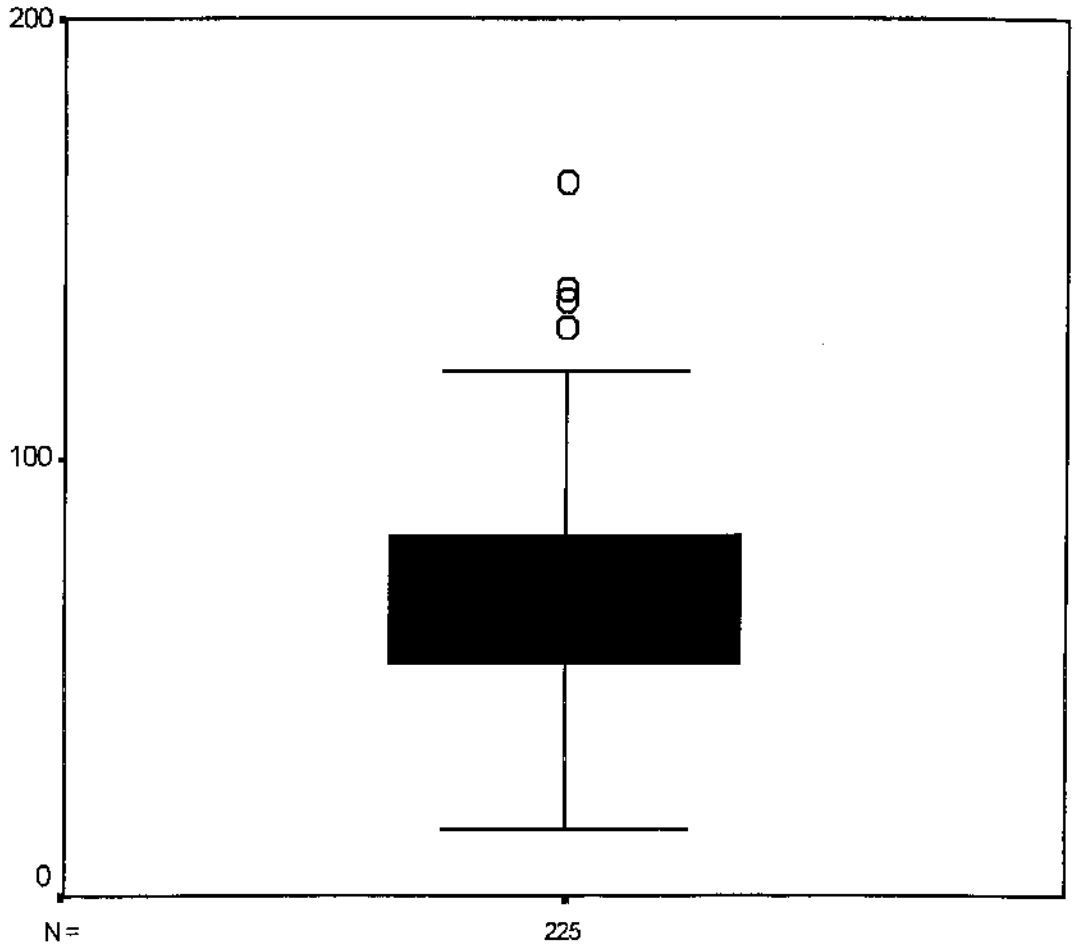
Descriptives

			Statistic	Std. Error
RESULT	Mean		68.2418	1.6052
	95% Confidence Interval for Mean	Lower Bound	65.0786	
		Upper Bound	71.4050	
	5% Trimmed Mean		67.3595	
	Median		66.1000	
	Variance		579.739	
	Std. Deviation		24.0778	
	Minimum		14.80	
	Maximum		163.00	
	Range		148.20	
	Interquartile Range		30.1500	
	Skewness		.651	.162
	Kurtosis		1.165	.323

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	2607	WHSSBE08	163.00
		2	2609	WHSSB024	139.00
		3	2608	WHSSB001	139.00
		4	2605	FTSSB008	136.00
		5	2610	WHSSB022	136.00
	Lowest	1	2820	S37-06	14.80
		2	2819	S37-09	15.30
		3	2818	S37-07	15.80
		4	2817	S37-02	24.00
		5	2816	S37-08	25.10

VANADIUM



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
O	WHT	WHSSBE08	163
O	SOSA	WHSSB001	139
O	WHT	WHSSB024	139
O	SOSA	WHSSB022	136
O	FTA	FTSSB008	136

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

ZINC

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RESULT	219	100.0%	0	.0%	219	100.0%

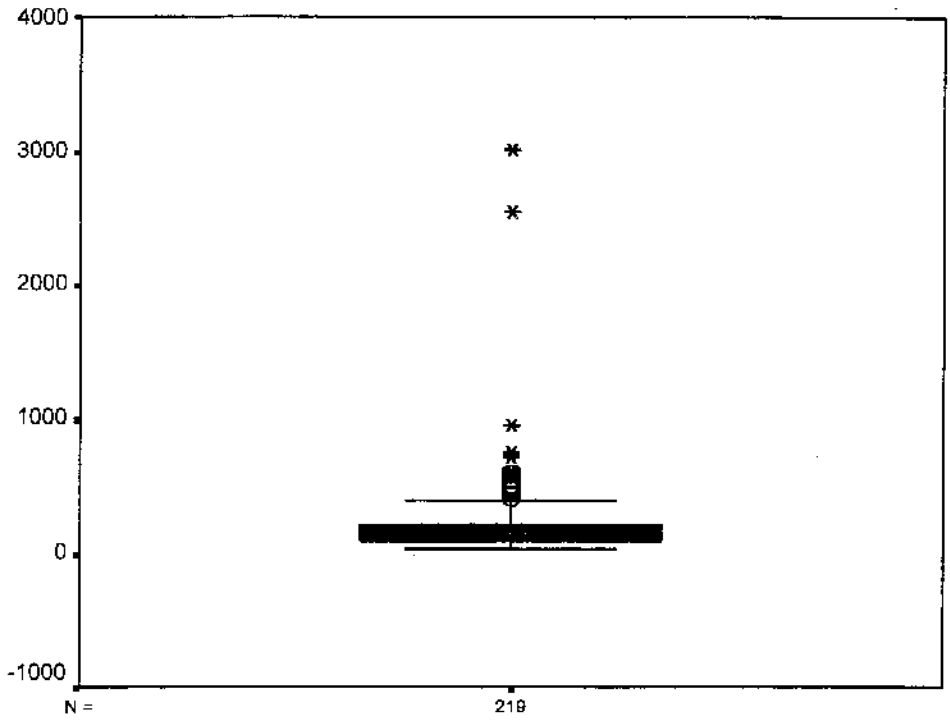
Descriptives

			Statistic	Std. Error
RESULT	Mean		197.9164	19.3391
	95% Confidence Interval for Mean	Lower Bound	159.8009	
		Upper Bound	236.0320	
	5% Trimmed Mean		158.9374	
	Median		127.0000	
	Variance		81906.055	
	Std. Deviation		286.1923	
	Minimum		33.10	
	Maximum		3010.00	
	Range		2976.90	
	Interquartile Range		125.2000	
	Skewness		7.157	.164
	Kurtosis		62.585	.327

Extreme Values

			Case Number	SMPID	Value
RESULT	Highest	1	2832	WHSSBI02	3010.00
		2	2833	WHSSBH03	2540.00
		3	2834	RADSB017	959.00
		4	2835	WHSSB009	746.00
		5	2836	TLSSB002	743.00
	Lowest	1	3039	WHSSB008	33.10
		2	3038	WHSSB027	36.00
		3	3037	S37-12	37.80
		4	3036	S37-01	41.70
		5	3035	RADSB025	46.90

ZINC



Extreme Values & Outliers	Site	Sample Location	Conc. (mg/kg)
*	WHT	WHSSBI02	3010
*	WHT	WHSSBH03	2540
*	RAT	RADSB017	959
*	WHT	WHSSB009	746
*	LFT	TLSSB002	743
*	WHT	WHSSB050	723
*	SOSA	WHSSB002	605
O	WHT	WHSSBD07	593
O	SOSA	WHSSBA02	568
O	WHT	WHSSBE04	544
O	WHT	WHSSB016	515
O	NOSA	RADSBA07	496
O	RAT	RADSBG08	488
O	NOSA	RADSB006	474
O	WHT	WHSSB013	467
O	FTA	FTSSB002	436
O	WHT	WHSSB014	426
O	RATA	RADSB013	424
O	WHT	WHSSBD03	417

* Values more than 3-box-lengths from 75th percentile (extreme values)

O Values more than 1.5 box-lengths from 75th percentile (outliers)

APPENDIX R

DESCRIPTIVE STATISTICS FOR WASTE EXTRACTION TESTS, MICROTOX, AND CYTOCHROME P450 FOR INORGANIC CONSTITUENTS

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
FTSSB001	0 - .3	ALUMINUM	14900		1480	93		0.52
FTSSB002	0 - .5	ALUMINUM	10700	126000	604	67		1.13
FTSSB003	0 - .2	ALUMINUM	14700		1370	51		0.64
FTSSB004	0 - .5	ALUMINUM	15800		1640	43	0.51	0.69
FTSSB005	0 - .5	ALUMINUM	37500		63	18	0.05	0.57
FTSSB006	0 - .5	ALUMINUM	16700		756	17	0.11	0.14
FTSSB007	0 - .2	ALUMINUM	9310	107000	23	9	0.19	0.57
FTSSB008	0 - .5	ALUMINUM	9260		407	29	0.05	0.01
FTSSB009	0 - .1	ALUMINUM	13100		710	44	0.31	0.59
RADSBA01	0 - .5	ALUMINUM	22200		1370	103	0.08	0.11
RADSBA07	0 - .5	ALUMINUM	23100		1010	26	0.31	1.12
RADSBB04	0 - .5	ALUMINUM	15200	158000	1170	28	0.72	0.59
RADSBB06	0 - .5	ALUMINUM	13200	141000	1650	16	1.35	0.55
RADSBB08	0 - .5	ALUMINUM	13500			49	1.91	3
RADSBC05	0 - .5	ALUMINUM	11700			21	1.18	0.76
RADSBD05	0 - .5	ALUMINUM	15800		125	14	1.39	0.34
RADSBD06	0 - .5	ALUMINUM	16400	252000	755	20	1.32	0.31
RADSBE03	0 - .5	ALUMINUM	32500	260000	4340	21	1.14	0.44
RADSBF06	0 - .5	ALUMINUM	14300		232	14	1.66	0.23
RADSBG04	0 - .5	ALUMINUM	19300		176	35	1.7	1.27
RADSBG08	0 - .5	ALUMINUM	10600			17	1.48	0.77
RADSBH06	0 - .5	ALUMINUM	26400	318000	1240	42	1.16	0.72
RADSBI02	0 - .5	ALUMINUM	17100		183	39	1.49	1.56
RADSBI04	0 - .5	ALUMINUM	25100	267000	325	154	1.35	1.97
RADSBI08	0 - .5	ALUMINUM	8410			9	0.03	0.14
RADSBJ02	0 - .5	ALUMINUM	13000		310	13	1.77	5.78
RADSBJ07	0 - .5	ALUMINUM	25900		988	49	1.78	1.16
RADSBK08	0 - .5	ALUMINUM	14200	172000	7110	21	0.05	0.36
RADSBM08	0 - .5	ALUMINUM	14700		125	134	0.07	0.76
RADSL001	0 - .5	ALUMINUM	13400	19900	921			
RADSL002	0 - .5	ALUMINUM	28700	186000	833			
WHSSBA04	0 - .5	ALUMINUM	17000		2050	60	0.09	0.01
WHSSBA06	0 - .5	ALUMINUM	20600		988	37		1.34
WHSSBB03	0 - .5	ALUMINUM	11800	147000	612	51	0.22	0.48
WHSSBB07	0 - .5	ALUMINUM	15300	360000	350000	10	1.5	0.33
WHSSBC02	0 - .5	ALUMINUM	17600		862	26	1.16	0.22
WHSSBC08	0 - .5	ALUMINUM	16900	388000	9940	103	0.05	0.19
WHSSBD03	0 - .5	ALUMINUM	18000		608	77	0.25	0.37
WHSSBE02	0 - .5	ALUMINUM	10200		387	50	2	0.95
WHSSBE06	0 - .5	ALUMINUM	11100		2150	119	2	1.04
WHSSBE08	0 - .5	ALUMINUM	7690		761	17	0.09	0.03
WHSSBF03	0 - .5	ALUMINUM	9750	134000	3060	135		1.01
WHSSBG06	0 - .5	ALUMINUM	12200	215000	833	150		1.09
WHSSBH07	0 - .5	ALUMINUM	14100		7740	67	1.84	0.42

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBI02	0 - .5	ALUMINUM	23900		93	92	0.02	0.15
WHSSBK06	0 - .5	ALUMINUM	11800	21000	4530	136		0.88
WHSSBK08	0 - .5	ALUMINUM	21700		523	28	1.67	0.69
WHSSBL05	0 - .5	ALUMINUM	15000			78	0.05	0.08
WHSSBM08	0 - .5	ALUMINUM	9100		1910	13	0.05	0.34
WHSSL001	0 - .5	ALUMINUM	28700	187000	1330			
WHSSL002	0 - .5	ALUMINUM	26500	191000	1950			
WHSSL003	0 - .5	ALUMINUM	35200	171000	538			
FTSSB001	0 - .3	ANTIMONY			4	93		0.52
FTSSB002	0 - .5	ANTIMONY		3.1	3	67		1.13
FTSSB003	0 - .2	ANTIMONY			7	51		0.64
FTSSB004	0 - .5	ANTIMONY			4	43	0.51	0.69
FTSSB008	0 - .5	ANTIMONY			3	29	0.05	0.01
RADSBA01	0 - .5	ANTIMONY	1			103	0.08	0.11
RADSBA07	0 - .5	ANTIMONY	7			26	0.31	1.12
RADSBB08	0 - .5	ANTIMONY	1			49	1.91	3
RADSBD06	0 - .5	ANTIMONY	1			20	1.32	0.31
RADSBE03	0 - .5	ANTIMONY	2	9.4		21	1.14	0.44
RADSBF06	0 - .5	ANTIMONY	2			14	1.66	0.23
RADSBG08	0 - .5	ANTIMONY	1			17	1.48	0.77
RADSBH06	0 - .5	ANTIMONY	1			42	1.16	0.72
RADSBI02	0 - .5	ANTIMONY	1			39	1.49	1.56
RADSBI04	0 - .5	ANTIMONY	1			154	1.35	1.97
RADSBJ02	0 - .5	ANTIMONY			2	13	1.77	5.78
RADSBJ07	0 - .5	ANTIMONY	1			49	1.78	1.16
RADSBK08	0 - .5	ANTIMONY	1			21	0.05	0.36
WHSSBA04	0 - .5	ANTIMONY	2			60	0.09	0.01
WHSSBA06	0 - .5	ANTIMONY	1			37		1.34
WHSSBB03	0 - .5	ANTIMONY	2		5	51	0.22	0.48
WHSSBB07	0 - .5	ANTIMONY	4	7		10	1.5	0.33
WHSSBC08	0 - .5	ANTIMONY	2	7.4	7	103	0.05	0.19
WHSSBE02	0 - .5	ANTIMONY	1			50	2	0.95
WHSSBE06	0 - .5	ANTIMONY	2		5	119	2	1.04
WHSSBE08	0 - .5	ANTIMONY	6		11	17	0.09	0.03
WHSSBF03	0 - .5	ANTIMONY			4	135		1.01
WHSSBG06	0 - .5	ANTIMONY	1	6.2	3	150		1.09
WHSSBH07	0 - .5	ANTIMONY			2	67	1.84	0.42
WHSSBI02	0 - .5	ANTIMONY	6		2	92	0.02	0.15
WHSSBK06	0 - .5	ANTIMONY	1		2	136		0.88
WHSSBK08	0 - .5	ANTIMONY	1			28	1.67	0.69
WHSSBL05	0 - .5	ANTIMONY	1		4	78	0.05	0.08
WHSSL001	0 - .5	ANTIMONY	2	9				
WHSSL002	0 - .5	ANTIMONY	2	7.8				
WHSSL003	0 - .5	ANTIMONY	2	11.7				

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
FTSSB001	0 - .3	ARSENIC	5		10	93		0.52
FTSSB002	0 - .5	ARSENIC	6	146	15	67		1.13
FTSSB003	0 - .2	ARSENIC	11		9	51		0.64
FTSSB004	0 - .5	ARSENIC	10		18	43	0.51	0.69
FTSSB005	0 - .5	ARSENIC	18		23	18	0.05	0.57
FTSSB006	0 - .5	ARSENIC	16		11	17	0.11	0.14
FTSSB007	0 - .2	ARSENIC		112	7	9	0.19	0.57
FTSSB008	0 - .5	ARSENIC	6		17	29	0.05	0.01
FTSSB009	0 - .1	ARSENIC	5		16	44	0.31	0.59
RADSBA01	0 - .5	ARSENIC	18		46	103	0.08	0.11
RADSBA07	0 - .5	ARSENIC	47		9	26	0.31	1.12
RADSBB04	0 - .5	ARSENIC	9	94.8	12	28	0.72	0.59
RADSBB06	0 - .5	ARSENIC	6	122	8	16	1.35	0.55
RADSBB08	0 - .5	ARSENIC	6		6	49	1.91	3
RADSBC05	0 - .5	ARSENIC	8		8	21	1.18	0.76
RADSBD05	0 - .5	ARSENIC	10			14	1.39	0.34
RADSBD06	0 - .5	ARSENIC	8	120	8	20	1.32	0.31
RADSBE03	0 - .5	ARSENIC	30	445	12	21	1.14	0.44
RADSBF06	0 - .5	ARSENIC	8			14	1.66	0.23
RADSBG04	0 - .5	ARSENIC	11			35	1.7	1.27
RADSBG08	0 - .5	ARSENIC			4	17	1.48	0.77
RADSBH06	0 - .5	ARSENIC	9	178		42	1.16	0.72
RADSBI02	0 - .5	ARSENIC	7			39	1.49	1.56
RADSBI04	0 - .5	ARSENIC	11	285		154	1.35	1.97
RADSBI08	0 - .5	ARSENIC	12		25	9	0.03	0.14
RADSBJ02	0 - .5	ARSENIC	6			13	1.77	5.78
RADSBJ07	0 - .5	ARSENIC	14		3	49	1.78	1.16
RADSBK08	0 - .5	ARSENIC	7	39.3	27	21	0.05	0.36
RADSBM08	0 - .5	ARSENIC	10		3	134	0.07	0.76
RADSL001	0 - .5	ARSENIC	13	41.2	41			
RADSL002	0 - .5	ARSENIC	18	28.8	16			
WHSSBA04	0 - .5	ARSENIC	9		12	60	0.09	0.01
WHSSBB03	0 - .5	ARSENIC	7	70.2	19	51	0.22	0.48
WHSSBB07	0 - .5	ARSENIC	7	51.8	45	10	1.5	0.33
WHSSBC02	0 - .5	ARSENIC	22		64	26	1.16	0.22
WHSSBC08	0 - .5	ARSENIC	11	15.1	21	103	0.05	0.19
WHSSBD03	0 - .5	ARSENIC	18		11	77	0.25	0.37
WHSSBE02	0 - .5	ARSENIC	3		3	50	2	0.95
WHSSBE06	0 - .5	ARSENIC	6			119	2	1.04
WHSSBE08	0 - .5	ARSENIC	5			17	0.09	0.03
WHSSBF03	0 - .5	ARSENIC	7	42.5	19	135		1.01
WHSSBG06	0 - .5	ARSENIC	3	26.9	3	150		1.09
WHSSBI02	0 - .5	ARSENIC	21			92	0.02	0.15
WHSSBK06	0 - .5	ARSENIC	3	30.1		136		0.88

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBK08	0 - .5	ARSENIC	8		9	28	1.67	0.69
WHSSBL05	0 - .5	ARSENIC	5			78	0.05	0.08
WHSSBM08	0 - .5	ARSENIC	15		13	13	0.05	0.34
WHSSL001	0 - .5	ARSENIC	21		14			
WHSSL002	0 - .5	ARSENIC	12					
WHSSL003	0 - .5	ARSENIC	26	52				
FTSSB001	0 - .3	BARIUM	165		101	93		0.52
FTSSB002	0 - .5	BARIUM	163	5650	33	67		1.13
FTSSB003	0 - .2	BARIUM	110		27	51		0.64
FTSSB004	0 - .5	BARIUM	96		31	43	0.51	0.69
FTSSB005	0 - .5	BARIUM	234		87	18	0.05	0.57
FTSSB006	0 - .5	BARIUM	130		49	17	0.11	0.14
FTSSB007	0 - .2	BARIUM	195	2140	93	9	0.19	0.57
FTSSB008	0 - .5	BARIUM	177		118	29	0.05	0.01
FTSSB009	0 - .1	BARIUM	71		22	44	0.31	0.59
RADSBA01	0 - .5	BARIUM	91		21	103	0.08	0.11
RADSBA07	0 - .5	BARIUM	77		12	26	0.31	1.12
RADSBB04	0 - .5	BARIUM	127	5020	53	28	0.72	0.59
RADSBB06	0 - .5	BARIUM	47	2710	35	16	1.35	0.55
RADSBB08	0 - .5	BARIUM	178		125	49	1.91	3
RADSBC05	0 - .5	BARIUM	162		33	21	1.18	0.76
RADSBD05	0 - .5	BARIUM	160		43	14	1.39	0.34
RADSBD06	0 - .5	BARIUM	149	5380	27	20	1.32	0.31
RADSBE03	0 - .5	BARIUM	155	2280	32	21	1.14	0.44
RADSBF06	0 - .5	BARIUM	44		23	14	1.66	0.23
RADSBG04	0 - .5	BARIUM	79		40	35	1.7	1.27
RADSBG08	0 - .5	BARIUM	140		95	17	1.48	0.77
RADSBH06	0 - .5	BARIUM	44	665	5	42	1.16	0.72
RADSBI02	0 - .5	BARIUM	76		29	39	1.49	1.56
RADSBI04	0 - .5	BARIUM	98	1400	48	154	1.35	1.97
RADSBI08	0 - .5	BARIUM	115		87	9	0.03	0.14
RADSBJ02	0 - .5	BARIUM	64		34	13	1.77	5.78
RADSBJ07	0 - .5	BARIUM	68		10	49	1.78	1.16
RADSBK08	0 - .5	BARIUM	203	9190	196	21	0.05	0.36
RADSBM08	0 - .5	BARIUM	237		82	134	0.07	0.76
RADSL001	0 - .5	BARIUM	65	5220	18			
RADSL002	0 - .5	BARIUM	81	1700	8			
WHSSBA04	0 - .5	BARIUM	256		134	60	0.09	0.01
WHSSBA06	0 - .5	BARIUM	19		4	37		1.34
WHSSBB03	0 - .5	BARIUM	250	11900	96	51	0.22	0.48
WHSSBB07	0 - .5	BARIUM	77	3420	3340	10	1.5	0.33
WHSSBC02	0 - .5	BARIUM	62		14	26	1.16	0.22
WHSSBC08	0 - .5	BARIUM	186	11700	413	103	0.05	0.19
WHSSBD03	0 - .5	BARIUM	84		7	77	0.25	0.37

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBE02	0 - .5	BARIUM	146		51	50	2	0.95
WHSSBE06	0 - .5	BARIUM	145		77	119	2	1.04
WHSSBE08	0 - .5	BARIUM	63		25	17	0.09	0.03
WHSSBF03	0 - .5	BARIUM	233	12700	149	135		1.01
WHSSBG06	0 - .5	BARIUM	107	12900	33	150		1.09
WHSSBH07	0 - .5	BARIUM	71		85	67	1.84	0.42
WHSSBI02	0 - .5	BARIUM	179		242	92	0.02	0.15
WHSSBK06	0 - .5	BARIUM	129	12200	135	136		0.88
WHSSBK08	0 - .5	BARIUM	212		1620	28	1.67	0.69
WHSSBL05	0 - .5	BARIUM	171		208	78	0.05	0.08
WHSSBM08	0 - .5	BARIUM	71		53	13	0.05	0.34
WHSSL001	0 - .5	BARIUM	90	1810	1780			
WHSSL002	0 - .5	BARIUM	87	1810	1160			
WHSSL003	0 - .5	BARIUM	83	1580	1130			
FTSSB002	0 - .5	BERYLLIUM		8.1		67		1.13
RADSBB04	0 - .5	BERYLLIUM		2.3		28	0.72	0.59
RADSBD06	0 - .5	BERYLLIUM		14.4		20	1.32	0.31
RADSBH06	0 - .5	BERYLLIUM		12		42	1.16	0.72
RADSBI04	0 - .5	BERYLLIUM		6		154	1.35	1.97
RADSBJ07	0 - .5	BERYLLIUM				49	1.78	1.16
RADSBK08	0 - .5	BERYLLIUM		3.2		21	0.05	0.36
RADSL001	0 - .5	BERYLLIUM		1.5				
RADSL002	0 - .5	BERYLLIUM		0.26				
WHSSBA04	0 - .5	BERYLLIUM				60	0.09	0.01
WHSSBB03	0 - .5	BERYLLIUM		5.8		51	0.22	0.48
WHSSBE02	0 - .5	BERYLLIUM				50	2	0.95
WHSSBE06	0 - .5	BERYLLIUM				119	2	1.04
WHSSBF03	0 - .5	BERYLLIUM		13.2		135		1.01
WHSSBG06	0 - .5	BERYLLIUM		11.9		150		1.09
WHSSBK06	0 - .5	BERYLLIUM		11.3		136		0.88
WHSSBK08	0 - .5	BERYLLIUM	1			28	1.67	0.69
WHSSL001	0 - .5	BERYLLIUM	1	13.6				
WHSSL002	0 - .5	BERYLLIUM	1	12.7				
WHSSL003	0 - .5	BERYLLIUM	1	14.1				
FTSSB001	0 - .3	CADMIUM				93		0.52
FTSSB002	0 - .5	CADMIUM	1	39.3		67		1.13
FTSSB003	0 - .2	CADMIUM	1			51		0.64
FTSSB006	0 - .5	CADMIUM				17	0.11	0.14
FTSSB007	0 - .2	CADMIUM		6.9		9	0.19	0.57
RADSBB04	0 - .5	CADMIUM		8.8		28	0.72	0.59
RADSBB06	0 - .5	CADMIUM		3.1		16	1.35	0.55
RADSBD05	0 - .5	CADMIUM	1			14	1.39	0.34
RADSBD06	0 - .5	CADMIUM		39.1		20	1.32	0.31
RADSBK08	0 - .5	CADMIUM		37.7		21	0.05	0.36

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSL001	0 - .5	CADMIUM	.	24.5	.	.	.	.
RADSL002	0 - .5	CADMIUM	.	7.7	.	.	.	.
WHSSBB03	0 - .5	CADMIUM	.	29.3	1	51	0.22	0.48
WHSSBF03	0 - .5	CADMIUM	4	21.2	2	135	.	1.01
WHSSBI02	0 - .5	CADMIUM	21	.	.	92	0.02	0.15
WHSSBK06	0 - .5	CADMIUM	.	1.3	.	136	.	0.88
WHSSBK08	0 - .5	CADMIUM	.	.	.	28	1.67	0.69
WHSSL001	0 - .5	CADMIUM	.	38.7	3	.	.	.
WHSSL002	0 - .5	CADMIUM	.	41.5	.	.	.	.
WHSSL003	0 - .5	CADMIUM	.	21	.	.	.	.
FTSSB001	0 - .3	CALCIUM	12000	.	7240	93	.	0.52
FTSSB002	0 - .5	CALCIUM	4330	217000	5890	67	.	1.13
FTSSB003	0 - .2	CALCIUM	5040	.	5590	51	.	0.64
FTSSB004	0 - .5	CALCIUM	4390	.	4410	43	0.51	0.69
FTSSB005	0 - .5	CALCIUM	7240	.	57600	18	0.05	0.57
FTSSB006	0 - .5	CALCIUM	6360	.	18800	17	0.11	0.14
FTSSB007	0 - .2	CALCIUM	12800	1910000	28100	9	0.19	0.57
FTSSB008	0 - .5	CALCIUM	3390	.	9870	29	0.05	0.01
FTSSB009	0 - .1	CALCIUM	8100	.	6040	44	0.31	0.59
RADSBA01	0 - .5	CALCIUM	3740	.	1540	103	0.08	0.11
RADSBA07	0 - .5	CALCIUM	3340	.	1970	26	0.31	1.12
RADSBB04	0 - .5	CALCIUM	2610	83800	1270	28	0.72	0.59
RADSBB06	0 - .5	CALCIUM	2900	115000	2570	16	1.35	0.55
RADSBB08	0 - .5	CALCIUM	9040	.	31900	49	1.91	3
RADSBC05	0 - .5	CALCIUM	13500	.	15000	21	1.18	0.76
RADSBD05	0 - .5	CALCIUM	3210	.	16100	14	1.39	0.34
RADSBD06	0 - .5	CALCIUM	3220	220000	2890	20	1.32	0.31
RADSBE03	0 - .5	CALCIUM	5290	121000	3610	21	1.14	0.44
RADSBF06	0 - .5	CALCIUM	6230	.	9730	14	1.66	0.23
RADSBG04	0 - .5	CALCIUM	2840	.	11500	35	1.7	1.27
RADSBG08	0 - .5	CALCIUM	6200	.	48100	17	1.48	0.77
RADSBH06	0 - .5	CALCIUM	3330	134000	5030	42	1.16	0.72
RADSBI02	0 - .5	CALCIUM	3990	.	13100	39	1.49	1.56
RADSBI04	0 - .5	CALCIUM	3470	133000	29800	154	1.35	1.97
RADSBI08	0 - .5	CALCIUM	19100	.	13600	9	0.03	0.14
RADSBJ02	0 - .5	CALCIUM	2520	.	11900	13	1.77	5.78
RADSBJ07	0 - .5	CALCIUM	3350	.	11200	49	1.78	1.16
RADSBK08	0 - .5	CALCIUM	12500	371000	9970	21	0.05	0.36
RADSBM08	0 - .5	CALCIUM	10800	.	6010	134	0.07	0.76
RADSL001	0 - .5	CALCIUM	2970	215000	2520	.	.	.
RADSL002	0 - .5	CALCIUM	4400	86100	1470	.	.	.
WHSSBA04	0 - .5	CALCIUM	2090	.	1480	60	0.09	0.01
WHSSBA06	0 - .5	CALCIUM	17900	.	7970	37	.	1.34
WHSSBB03	0 - .5	CALCIUM	2980	384000	2110	51	0.22	0.48

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBB07	0 - .5	CALCIUM	5000	240000	234000	10	1.5	0.33
WHSSBC02	0 - .5	CALCIUM	5630		5550	26	1.16	0.22
WHSSBC08	0 - .5	CALCIUM	3830	141000	5670	103	0.05	0.19
WHSSBD03	0 - .5	CALCIUM	5590		2540	77	0.25	0.37
WHSSBE02	0 - .5	CALCIUM	2140		3870	50	2	0.95
WHSSBE06	0 - .5	CALCIUM	4220		7890	119	2	1.04
WHSSBE08	0 - .5	CALCIUM	4430		3260	17	0.09	0.03
WHSSBF03	0 - .5	CALCIUM	14000	1460000	3700	135		1.01
WHSSBG06	0 - .5	CALCIUM	5380	393000	5450	150		1.09
WHSSBH07	0 - .5	CALCIUM	5540		3820	67	1.84	0.42
WHSSBI02	0 - .5	CALCIUM	8130		31500	92	0.02	0.15
WHSSBK06	0 - .5	CALCIUM	3380	269000	9230	136		0.88
WHSSBK08	0 - .5	CALCIUM	14200		30900	28	1.67	0.69
WHSSBL05	0 - .5	CALCIUM	84000		93700	78	0.05	0.08
WHSSBM08	0 - .5	CALCIUM	7950		5280	13	0.05	0.34
WHSSL001	0 - .5	CALCIUM	4530	89500	12700			
WHSSL002	0 - .5	CALCIUM	3800	98000	14200			
WHSSL003	0 - .5	CALCIUM	2710	83900	7730			
FTSSB001	0 - .3	CHROMIUM	34			93		0.52
FTSSB002	0 - .5	CHROMIUM	26	184		67		1.13
FTSSB003	0 - .2	CHROMIUM	47			51		0.64
FTSSB004	0 - .5	CHROMIUM	48			43	0.51	0.69
FTSSB005	0 - .5	CHROMIUM	106			18	0.05	0.57
FTSSB006	0 - .5	CHROMIUM	51			17	0.11	0.14
FTSSB007	0 - .2	CHROMIUM	25	251		9	0.19	0.57
FTSSB008	0 - .5	CHROMIUM	28			29	0.05	0.01
FTSSB009	0 - .1	CHROMIUM	39			44	0.31	0.59
RADSBA01	0 - .5	CHROMIUM	71			103	0.08	0.11
RADSBA07	0 - .5	CHROMIUM	319			26	0.31	1.12
RADSBB04	0 - .5	CHROMIUM	54	531		28	0.72	0.59
RADSBB06	0 - .5	CHROMIUM	41	431		16	1.35	0.55
RADSBB08	0 - .5	CHROMIUM	31			49	1.91	3
RADSBC05	0 - .5	CHROMIUM	42			21	1.18	0.76
RADSBD05	0 - .5	CHROMIUM	46			14	1.39	0.34
RADSBD06	0 - .5	CHROMIUM	47	537		20	1.32	0.31
RADSBE03	0 - .5	CHROMIUM	101	472	14	21	1.14	0.44
RADSBG04	0 - .5	CHROMIUM	70			35	1.7	1.27
RADSBH06	0 - .5	CHROMIUM	93	587		42	1.16	0.72
RADSBI02	0 - .5	CHROMIUM	61			39	1.49	1.56
RADSBI04	0 - .5	CHROMIUM	82	715		154	1.35	1.97
RADSBI08	0 - .5	CHROMIUM	24			9	0.03	0.14
RADSBJ02	0 - .5	CHROMIUM	51			13	1.77	5.78
RADSBJ07	0 - .5	CHROMIUM	75			49	1.78	1.16
RADSBK08	0 - .5	CHROMIUM	34	286		21	0.05	0.36

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSBM08	0 - .5	CHROMIUM	38			134	0.07	0.76
RADSL001	0 - .5	CHROMIUM	48	673				
RADSL002	0 - .5	CHROMIUM	96	606				
WHSSBA04	0 - .5	CHROMIUM	37		4	60	0.09	0.01
WHSSBA06	0 - .5	CHROMIUM	15			37		1.34
WHSSBB03	0 - .5	CHROMIUM	22	184		51	0.22	0.48
WHSSBB07	0 - .5	CHROMIUM	43	546	525	10	1.5	0.33
WHSSBC02	0 - .5	CHROMIUM	53			26	1.16	0.22
WHSSBC08	0 - .5	CHROMIUM	49	928	28	103	0.05	0.19
WHSSBD03	0 - .5	CHROMIUM	56		3	77	0.25	0.37
WHSSBE02	0 - .5	CHROMIUM	25			50	2	0.95
WHSSBE06	0 - .5	CHROMIUM	39		7	119	2	1.04
WHSSBE08	0 - .5	CHROMIUM	37		4	17	0.09	0.03
WHSSBF03	0 - .5	CHROMIUM	24	141	8	135		1.01
WHSSBG06	0 - .5	CHROMIUM	28	349		150		1.09
WHSSBH07	0 - .5	CHROMIUM	28		14	67	1.84	0.42
WHSSBI02	0 - .5	CHROMIUM	70			92	0.02	0.15
WHSSBK06	0 - .5	CHROMIUM	24	253	7	136		0.88
WHSSBK08	0 - .5	CHROMIUM	44		5	28	1.67	0.69
WHSSBL05	0 - .5	CHROMIUM	41			78	0.05	0.08
WHSSBM08	0 - .5	CHROMIUM	37			13	0.05	0.34
WHSSL001	0 - .5	CHROMIUM	87	570	4			
WHSSL002	0 - .5	CHROMIUM	85	594	6			
WHSSL003	0 - .5	CHROMIUM	95	482	3			
FTSSB001	0 - .3	COBALT	13		1	93		0.52
FTSSB002	0 - .5	COBALT	7	190	1	67		1.13
FTSSB003	0 - .2	COBALT	9		1	51		0.64
FTSSB004	0 - .5	COBALT	10			43	0.51	0.69
FTSSB005	0 - .5	COBALT	18		1	18	0.05	0.57
FTSSB006	0 - .5	COBALT	8		1	17	0.11	0.14
FTSSB007	0 - .2	COBALT	12	3.7		9	0.19	0.57
FTSSB008	0 - .5	COBALT	12		1	29	0.05	0.01
FTSSB009	0 - .1	COBALT	12		1	44	0.31	0.59
RADSBA01	0 - .5	COBALT	20		2	103	0.08	0.11
RADSBA07	0 - .5	COBALT	20		2	26	0.31	1.12
RADSBB04	0 - .5	COBALT	14	318	3	28	0.72	0.59
RADSBB06	0 - .5	COBALT	9	322	2	16	1.35	0.55
RADSBB08	0 - .5	COBALT	13			49	1.91	3
RADSBC05	0 - .5	COBALT	18			21	1.18	0.76
RADSBD05	0 - .5	COBALT	19			14	1.39	0.34
RADSBD06	0 - .5	COBALT	15	622		20	1.32	0.31
RADSBE03	0 - .5	COBALT	12	126	2	21	1.14	0.44
RADSBF06	0 - .5	COBALT	14		11	14	1.66	0.23
RADSBG04	0 - .5	COBALT	11		10	35	1.7	1.27

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSBG08	0 - .5	COBALT	12	.	.	17	1.48	0.77
RADSBH06	0 - .5	COBALT	15	319	1	42	1.16	0.72
RADSBI02	0 - .5	COBALT	12	.	.	39	1.49	1.56
RADSBI04	0 - .5	COBALT	14	288	15	154	1.35	1.97
RADSBI08	0 - .5	COBALT	19	.	2	9	0.03	0.14
RADSBJ02	0 - .5	COBALT	12	.	9	13	1.77	5.78
RADSBJ07	0 - .5	COBALT	11	.	.	49	1.78	1.16
RADSBK08	0 - .5	COBALT	16	652	5	21	0.05	0.36
RADSBM08	0 - .5	COBALT	20	.	.	134	0.07	0.76
RADSL001	0 - .5	COBALT	18	309	2	.	.	.
RADSL002	0 - .5	COBALT	25	211	1	.	.	.
WHSSBA04	0 - .5	COBALT	15	.	3	60	0.09	0.01
WHSSBA06	0 - .5	COBALT	24	.	1	37	.	1.34
WHSSBB03	0 - .5	COBALT	12	515	8	51	0.22	0.48
WHSSBB07	0 - .5	COBALT	17	227	220	10	1.5	0.33
WHSSBC02	0 - .5	COBALT	7	.	.	26	1.16	0.22
WHSSBC08	0 - .5	COBALT	21	903	31	103	0.05	0.19
WHSSBD03	0 - .5	COBALT	7	.	.	77	0.25	0.37
WHSSBE02	0 - .5	COBALT	9	.	1	50	2	0.95
WHSSBE06	0 - .5	COBALT	11	.	2	119	2	1.04
WHSSBE08	0 - .5	COBALT	7	.	.	17	0.09	0.03
WHSSBF03	0 - .5	COBALT	12	307	3	135	.	1.01
WHSSBG06	0 - .5	COBALT	11	442	.	150	.	1.09
WHSSBH07	0 - .5	COBALT	17	.	6	67	1.84	0.42
WHSSBI02	0 - .5	COBALT	25	.	12	92	0.02	0.15
WHSSBK06	0 - .5	COBALT	12	636	2	136	.	0.88
WHSSBK08	0 - .5	COBALT	17	.	1	28	1.67	0.69
WHSSBL05	0 - .5	COBALT	15	.	.	78	0.05	0.08
WHSSBM08	0 - .5	COBALT	11	.	4	13	0.05	0.34
WHSSL001	0 - .5	COBALT	25	158	13	.	.	.
WHSSL002	0 - .5	COBALT	20	150	5	.	.	.
WHSSL003	0 - .5	COBALT	13	218	1	.	.	.
FTSSB001	0 - .3	COPPER	30	.	23	93	.	0.52
FTSSB002	0 - .5	COPPER	55	153	38	67	.	1.13
FTSSB003	0 - .2	COPPER	60	.	23	51	.	0.64
FTSSB004	0 - .5	COPPER	63	.	54	43	0.51	0.69
FTSSB005	0 - .5	COPPER	86	.	.	18	0.05	0.57
FTSSB006	0 - .5	COPPER	65	.	18	17	0.11	0.14
FTSSB007	0 - .2	COPPER	25	755	7	9	0.19	0.57
FTSSB008	0 - .5	COPPER	27	.	39	29	0.05	0.01
FTSSB009	0 - .1	COPPER	34	.	25	44	0.31	0.59
RADSBA01	0 - .5	COPPER	56	.	176	103	0.08	0.11
RADSBA07	0 - .5	COPPER	272	.	44	26	0.31	1.12
RADSBB04	0 - .5	COPPER	30	840	36	28	0.72	0.59

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSBB06	0 - .5	COPPER	35	1030	39	16	1.35	0.55
RADSBB08	0 - .5	COPPER	26		12	49	1.91	3
RADSBC05	0 - .5	COPPER	21		9	21	1.18	0.76
RADSBD05	0 - .5	COPPER	38		9	14	1.39	0.34
RADSBD06	0 - .5	COPPER	39	1450	22	20	1.32	0.31
RADSBE03	0 - .5	COPPER	77	1600	28	21	1.14	0.44
RADSBF06	0 - .5	COPPER	63		10	14	1.66	0.23
RADSBG04	0 - .5	COPPER	27		5	35	1.7	1.27
RADSBG08	0 - .5	COPPER	25			17	1.48	0.77
RADSBH06	0 - .5	COPPER	30	1170	9	42	1.16	0.72
RADSBI02	0 - .5	COPPER	21			39	1.49	1.56
RADSBI04	0 - .5	COPPER	44	1450	7	154	1.35	1.97
RADSBI08	0 - .5	COPPER	21			9	0.03	0.14
RADSBJ02	0 - .5	COPPER	19		5	13	1.77	5.78
RADSBJ07	0 - .5	COPPER	70		9	49	1.78	1.16
RADSBK08	0 - .5	COPPER	43	1170	78	21	0.05	0.36
RADSBM08	0 - .5	COPPER	34		17	134	0.07	0.76
RADSL001	0 - .5	COPPER	64	838	52			
RADSL002	0 - .5	COPPER	76	245	32			
WHSSBA04	0 - .5	COPPER	31		8	60	0.09	0.01
WHSSBA06	0 - .5	COPPER	67		8	37		1.34
WHSSBB03	0 - .5	COPPER	23	494	41	51	0.22	0.48
WHSSBB07	0 - .5	COPPER	83	2420	2320	10	1.5	0.33
WHSSBC02	0 - .5	COPPER	69		35	26	1.16	0.22
WHSSBC08	0 - .5	COPPER	56	2100	190	103	0.05	0.19
WHSSBD03	0 - .5	COPPER	103		34	77	0.25	0.37
WHSSBE02	0 - .5	COPPER	14		9	50	2	0.95
WHSSBE06	0 - .5	COPPER	35		17	119	2	1.04
WHSSBF08	0 - .5	COPPER	78		50	17	0.09	0.03
WHSSBF03	0 - .5	COPPER	42	351	74	135		1.01
WHSSBG06	0 - .5	COPPER	15	558	4	150		1.09
WHSSBH07	0 - .5	COPPER	32		56	67	1.84	0.42
WHSSBI02	0 - .5	COPPER	228		5	92	0.02	0.15
WHSSBK06	0 - .5	COPPER	36	1040	15	136		0.88
WHSSBK08	0 - .5	COPPER	34		21	28	1.67	0.69
WHSSBL05	0 - .5	COPPER	28		5	78	0.05	0.08
WHSSBM08	0 - .5	COPPER	45		41	13	0.05	0.34
WHSSL001	0 - .5	COPPER	76	9.6	47			
WHSSL002	0 - .5	COPPER	72	17.3	22			
WHSSL003	0 - .5	COPPER	74	448	17			
FTSSB001	0 - .3	IRON	19500		1190	93		0.52
FTSSB002	0 - .5	IRON	16900	173000	955	67		1.13
FTSSB003	0 - .2	IRON	22100		2620	51		0.64
FTSSB004	0 - .5	IRON	18900		1640	43	0.51	0.69

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
FTSSB005	0 - .5	IRON	47100		578	18	0.05	0.57
FTSSB006	0 - .5	IRON	18500		594	17	0.11	0.14
FTSSB007	0 - .2	IRON	16100	272000		9	0.19	0.57
FTSSB008	0 - .5	IRON	15400		737	29	0.05	0.01
FTSSB009	0 - .1	IRON	20400		1250	44	0.31	0.59
RADSBA01	0 - .5	IRON	36500		3450	103	0.08	0.11
RADSBA07	0 - .5	IRON	135000		1960	26	0.31	1.12
RADSBB04	0 - .5	IRON	25200	390000	2960	28	0.72	0.59
RADSBB06	0 - .5	IRON	19600	364000	5250	16	1.35	0.55
RADSBB08	0 - .5	IRON	21500		47	49	1.91	3
RADSBC05	0 - .5	IRON	20100			21	1.18	0.76
RADSBD05	0 - .5	IRON	24100			14	1.39	0.34
RADSBD06	0 - .5	IRON	24100	395000	1140	20	1.32	0.31
RADSBE03	0 - .5	IRON	41900	386000	4040	21	1.14	0.44
RADSBF06	0 - .5	IRON	19800		414	14	1.66	0.23
RADSBG04	0 - .5	IRON	37900		129	35	1.7	1.27
RADSBG08	0 - .5	IRON	16500			17	1.48	0.77
RADSBH06	0 - .5	IRON	34600	476000	1680	42	1.16	0.72
RADSBI02	0 - .5	IRON	29100		234	39	1.49	1.56
RADSBI04	0 - .5	IRON	35200	748000	203	154	1.35	1.97
RADSBI08	0 - .5	IRON	25800		907	9	0.03	0.14
RADSBJ02	0 - .5	IRON	25500		474	13	1.77	5.78
RADSBJ07	0 - .5	IRON	28500		1350	49	1.78	1.16
RADSBK08	0 - .5	IRON	24400	237000	8250	21	0.05	0.36
RADSBM08	0 - .5	IRON	26400		340	134	0.07	0.76
RADSL001	0 - .5	IRON	25500	474000	2520			
RADSL002	0 - .5	IRON	49500	507000	1920			
WHSSBA04	0 - .5	IRON	26100		1030	60	0.09	0.01
WHSSBA06	0 - .5	IRON	38900		1180	37		1.34
WHSSBB03	0 - .5	IRON	19900	316000	1700	51	0.22	0.48
WHSSBB07	0 - .5	IRON	37200	835000	769000	10	1.5	0.33
WHSSBC02	0 - .5	IRON	22100		1280	26	1.16	0.22
WHSSBC08	0 - .5	IRON	32800	755000	10100	103	0.05	0.19
WHSSBD03	0 - .5	IRON	22100		1930	77	0.25	0.37
WHSSBE02	0 - .5	IRON	13400		384	50	2	0.95
WHSSBE06	0 - .5	IRON	18300		2350	119	2	1.04
WHSSBE08	0 - .5	IRON	18900		2640	17	0.09	0.03
WHSSBF03	0 - .5	IRON	18700	95000	4590	135		1.01
WHSSBG06	0 - .5	IRON	14600	188000	713	150		1.09
WHSSBH07	0 - .5	IRON	27000		9830	67	1.84	0.42
WHSSBI02	0 - .5	IRON	43100		131	92	0.02	0.15
WHSSBK06	0 - .5	IRON	14500	188000	3830	136		0.88
WHSSBK08	0 - .5	IRON	31200		389	28	1.67	0.69
WHSSBL05	0 - .5	IRON	23800			78	0.05	0.08

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBM08	0 - .5	IRON	42500	.	5010	13	0.05	0.34
WHSSL001	0 - .5	IRON	51100	602000	10900	.	.	.
WHSSL002	0 - .5	IRON	48600	577000	11500	.	.	.
WHSSL003	0 - .5	IRON	37900	657000	1650	.	.	.
FTSSB001	0 - .3	LEAD	72	.	38	93	.	0.52
FTSSB002	0 - .5	LEAD	515	11000	58	67	.	1.13
FTSSB003	0 - .2	LEAD	211	.	36	51	.	0.64
FTSSB004	0 - .5	LEAD	86	.	34	43	0.51	0.69
FTSSB005	0 - .5	LEAD	115	.	.	18	0.05	0.57
FTSSB006	0 - .5	LEAD	157	.	.	17	0.11	0.14
FTSSB007	0 - .2	LEAD	14	791	.	9	0.19	0.57
FTSSB008	0 - .5	LEAD	20	.	.	29	0.05	0.01
FTSSB009	0 - .1	LEAD	143	.	52	44	0.31	0.59
RADSBA01	0 - .5	LEAD	128	.	134	103	0.08	0.11
RADSBA07	0 - .5	LEAD	106	.	19	26	0.31	1.12
RADSBB04	0 - .5	LEAD	55	2710	26	28	0.72	0.59
RADSBB06	0 - .5	LEAD	53	3010	49	16	1.35	0.55
RADSBB08	0 - .5	LEAD	33	.	.	49	1.91	3
RADSBC05	0 - .5	LEAD	164	.	.	21	1.18	0.76
RADSBD05	0 - .5	LEAD	68	.	.	14	1.39	0.34
RADSBD06	0 - .5	LEAD	79	5310	16	20	1.32	0.31
RADSBE03	0 - .5	LEAD	56	1690	12	21	1.14	0.44
RADSBF06	0 - .5	LEAD	208	.	7	14	1.66	0.23
RADSBG04	0 - .5	LEAD	15	.	.	35	1.7	1.27
RADSBG08	0 - .5	LEAD	39	.	.	17	1.48	0.77
RADSBH06	0 - .5	LEAD	25	1470	7	42	1.16	0.72
RADSBI02	0 - .5	LEAD	8	.	.	39	1.49	1.56
RADSBI04	0 - .5	LEAD	52	2210	.	154	1.35	1.97
RADSBI08	0 - .5	LEAD	10	.	3	9	0.03	0.14
RADSBJ02	0 - .5	LEAD	8	.	.	13	1.77	5.78
RADSBJ07	0 - .5	LEAD	45	.	.	49	1.78	1.16
RADSBK08	0 - .5	LEAD	26	2680	25	21	0.05	0.36
RADSBM08	0 - .5	LEAD	11	.	.	134	0.07	0.76
RADSL001	0 - .5	LEAD	90	2950	61	.	.	.
RADSL002	0 - .5	LEAD	40	1090	9	.	.	.
WHSSBA04	0 - .5	LEAD	10	.	3	60	0.09	0.01
WHSSBA06	0 - .5	LEAD	4	.	.	37	.	1.34
WHSSBB03	0 - .5	LEAD	15	978	10	51	0.22	0.48
WHSSBB07	0 - .5	LEAD	68	3700	3630	10	1.5	0.33
WHSSBC02	0 - .5	LEAD	175	.	26	26	1.16	0.22
WHSSBC08	0 - .5	LEAD	11	546	26	103	0.05	0.19
WHSSBD03	0 - .5	LEAD	218	.	16	77	0.25	0.37
WHSSBE02	0 - .5	LEAD	11	.	2	50	2	0.95
WHSSBE06	0 - .5	LEAD	91	.	16	119	2	1.04

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBE08	0 - .5	LEAD	320		76	17	0.09	0.03
WHSSBF03	0 - .5	LEAD	49	417	58	135		1.01
WHSSBG06	0 - .5	LEAD	7	343	2	150		1.09
WHSSBH07	0 - .5	LEAD	15		11	67	1.84	0.42
WHSSBI02	0 - .5	LEAD	195		2	92	0.02	0.15
WHSSBK06	0 - .5	LEAD	12	617	5	136		0.88
WHSSBK08	0 - .5	LEAD	11		8	28	1.67	0.69
WHSSBL05	0 - .5	LEAD	33			78	0.05	0.08
WHSSBM08	0 - .5	LEAD	28		35	13	0.05	0.34
WHSSL001	0 - .5	LEAD	42	566	17			
WHSSL002	0 - .5	LEAD	40	646	20			
WHSSL003	0 - .5	LEAD	52	1350	7			
FTSSB001	0 - .3	MAGNESIUM	6530		3200	93		0.52
FTSSB002	0 - .5	MAGNESIUM	5560	142000	4170	67		1.13
FTSSB003	0 - .2	MAGNESIUM	7010		5560	51		0.64
FTSSB004	0 - .5	MAGNESIUM	8810		4660	43	0.51	0.69
FTSSB005	0 - .5	MAGNESIUM	15400		49000	18	0.05	0.57
FTSSB006	0 - .5	MAGNESIUM	7980		22300	17	0.11	0.14
FTSSB007	0 - .2	MAGNESIUM	10700	447000	98500	9	0.19	0.57
FTSSB008	0 - .5	MAGNESIUM	6700		10200	29	0.05	0.01
FTSSB009	0 - .1	MAGNESIUM	9060		4900	44	0.31	0.59
RADSBA01	0 - .5	MAGNESIUM	10900		2110	103	0.08	0.11
RADSBA07	0 - .5	MAGNESIUM	9780		3140	26	0.31	1.12
RADSBB04	0 - .5	MAGNESIUM	11300	218000	2050	28	0.72	0.59
RADSBB06	0 - .5	MAGNESIUM	7450	175000	4050	16	1.35	0.55
RADSBB08	0 - .5	MAGNESIUM	8080		7180	49	1.91	3
RADSBC05	0 - .5	MAGNESIUM	10900		13700	21	1.18	0.76
RADSBD05	0 - .5	MAGNESIUM	11400		26700	14	1.39	0.34
RADSBD06	0 - .5	MAGNESIUM	11300	342000	4110	20	1.32	0.31
RADSBE03	0 - .5	MAGNESIUM	13800	199000	6550	21	1.14	0.44
RADSBF06	0 - .5	MAGNESIUM	8530		20000	14	1.66	0.23
RADSBG04	0 - .5	MAGNESIUM	11600		31000	35	1.7	1.27
RADSBG08	0 - .5	MAGNESIUM	7620		38200	17	1.48	0.77
RADSBH06	0 - .5	MAGNESIUM	13100	208000	8830	42	1.16	0.72
RADSBI02	0 - .5	MAGNESIUM	10500		16000	39	1.49	1.56
RADSBI04	0 - .5	MAGNESIUM	13000	299000	66700	154	1.35	1.97
RADSBI08	0 - .5	MAGNESIUM	6840		15600	9	0.03	0.14
RADSBJ02	0 - .5	MAGNESIUM	10100		24500	13	1.77	5.78
RADSBJ07	0 - .5	MAGNESIUM	10300		22500	49	1.78	1.16
RADSBK08	0 - .5	MAGNESIUM	11100	259000	10900	21	0.05	0.36
RADSBM08	0 - .5	MAGNESIUM	10500		6180	134	0.07	0.76
RADSL001	0 - .5	MAGNESIUM	8010	204000	2760			
RADSL002	0 - .5	MAGNESIUM	14600	183000	2310			
WHSSBA04	0 - .5	MAGNESIUM	9230		2930	60	0.09	0.01

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBA06	0 - .5	MAGNESIUM	14100	.	3560	37	.	1.34
WHSSBB03	0 - .5	MAGNESIUM	6720	169000	1900	51	0.22	0.48
WHSSBB07	0 - .5	MAGNESIUM	10600	164000	156000	10	1.5	0.33
WHSSBC02	0 - .5	MAGNESIUM	9940	.	10900	26	1.16	0.22
WHSSBC08	0 - .5	MAGNESIUM	9740	489000	11000	103	0.05	0.19
WHSSBD03	0 - .5	MAGNESIUM	10000	.	4020	77	0.25	0.37
WHSSBE02	0 - .5	MAGNESIUM	3720	.	5020	50	2	0.95
WHSSBE06	0 - .5	MAGNESIUM	5150	.	5150	119	2	1.04
WHSSBE08	0 - .5	MAGNESIUM	5540	.	4240	17	0.09	0.03
WHSSBF03	0 - .5	MAGNESIUM	6970	204000	4790	135	.	1.01
WHSSBG06	0 - .5	MAGNESIUM	5180	201000	3600	150	.	1.09
WHSSBH07	0 - .5	MAGNESIUM	10400	.	7950	67	1.84	0.42
WHSSBI02	0 - .5	MAGNESIUM	16300	.	29500	92	0.02	0.15
WHSSBK06	0 - .5	MAGNESIUM	4150	173000	7110	136	.	0.88
WHSSBK08	0 - .5	MAGNESIUM	11100	.	9600	28	1.67	0.69
WHSSBL05	0 - .5	MAGNESIUM	10700	.	44000	78	0.05	0.08
WHSSBM08	0 - .5	MAGNESIUM	6350	.	5680	13	0.05	0.34
WHSSL001	0 - .5	MAGNESIUM	12900	174000	18200	.	.	.
WHSSL002	0 - .5	MAGNESIUM	13200	181000	22800	.	.	.
WHSSL003	0 - .5	MAGNESIUM	10200	148000	16700	.	.	.
FTSSB001	0 - .3	MANGANESE	608	.	46	93	.	0.52
FTSSB002	0 - .5	MANGANESE	171	4070	17	67	.	1.13
FTSSB003	0 - .2	MANGANESE	186	.	24	51	.	0.64
FTSSB004	0 - .5	MANGANESE	179	.	8	43	0.51	0.69
FTSSB005	0 - .5	MANGANESE	382	.	590	18	0.05	0.57
FTSSB006	0 - .5	MANGANESE	186	.	141	17	0.11	0.14
FTSSB007	0 - .2	MANGANESE	706	45300	.	9	0.19	0.57
FTSSB008	0 - .5	MANGANESE	182	.	20	29	0.05	0.01
FTSSB009	0 - .1	MANGANESE	314	.	13	44	0.31	0.59
RADSBA01	0 - .5	MANGANESE	344	.	52	103	0.08	0.11
RADSBA07	0 - .5	MANGANESE	401	.	32	26	0.31	1.12
RADSBB04	0 - .5	MANGANESE	229	4290	40	28	0.72	0.59
RADSBB06	0 - .5	MANGANESE	257	9090	51	16	1.35	0.55
RADSBB08	0 - .5	MANGANESE	601	.	8	49	1.91	3
RADSBC05	0 - .5	MANGANESE	793	.	.	21	1.18	0.76
RADSBD05	0 - .5	MANGANESE	1250	.	.	14	1.39	0.34
RADSBD06	0 - .5	MANGANESE	657	42800	16	20	1.32	0.31
RADSBE03	0 - .5	MANGANESE	240	2700	47	21	1.14	0.44
RADSBF06	0 - .5	MANGANESE	489	.	847	14	1.66	0.23
RADSBG04	0 - .5	MANGANESE	249	.	462	35	1.7	1.27
RADSBG08	0 - .5	MANGANESE	443	.	81	17	1.48	0.77
RADSBH06	0 - .5	MANGANESE	320	7360	31	42	1.16	0.72
RADSBI02	0 - .5	MANGANESE	285	.	8	39	1.49	1.56
RADSBI04	0 - .5	MANGANESE	276	5780	908	154	1.35	1.97

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSBI08	0 - .5	MANGANESE	2090	.	812	9	0.03	0.14
RADSBJ02	0 - .5	MANGANESE	297	.	308	13	1.77	5.78
RADSBJ07	0 - .5	MANGANESE	257	.	110	49	1.78	1.16
RADSBK08	0 - .5	MANGANESE	667	30100	140	21	0.05	0.36
RADSBM08	0 - .5	MANGANESE	446	.	5	134	0.07	0.76
RADSL001	0 - .5	MANGANESE	293	8410	54	.	.	.
RADSL002	0 - .5	MANGANESE	419	4770	31	.	.	.
WHSSBA04	0 - .5	MANGANESE	551	.	110	60	0.09	0.01
WHSSBA06	0 - .5	MANGANESE	752	.	46	37	.	1.34
WHSSBB03	0 - .5	MANGANESE	354	14900	163	51	0.22	0.48
WHSSBB07	0 - .5	MANGANESE	234	3750	3590	10	1.5	0.33
WHSSBC02	0 - .5	MANGANESE	164	.	23	26	1.16	0.22
WHSSBC08	0 - .5	MANGANESE	772	42600	1490	103	0.05	0.19
WHSSBD03	0 - .5	MANGANESE	185	.	19	77	0.25	0.37
WHSSBE02	0 - .5	MANGANESE	420	.	9	50	2	0.95
WHSSBE06	0 - .5	MANGANESE	366	.	87	119	2	1.04
WHSSBE08	0 - .5	MANGANESE	110	.	19	17	0.09	0.03
WHSSBF03	0 - .5	MANGANESE	901	24200	117	135	.	1.01
WHSSBG06	0 - .5	MANGANESE	435	18600	5	150	.	1.09
WHSSBH07	0 - .5	MANGANESE	417	.	133	67	1.84	0.42
WHSSBI02	0 - .5	MANGANESE	1080	.	4440	92	0.02	0.15
WHSSBK06	0 - .5	MANGANESE	488	36100	107	136	.	0.88
WHSSBK08	0 - .5	MANGANESE	656	.	33	28	1.67	0.69
WHSSBL05	0 - .5	MANGANESE	781	.	2	78	0.05	0.08
WHSSBM08	0 - .5	MANGANESE	295	.	189	13	0.05	0.34
WHSSL001	0 - .5	MANGANESE	490	5630	323	.	.	.
WHSSL002	0 - .5	MANGANESE	430	5970	441	.	.	.
WHSSL003	0 - .5	MANGANESE	205	3620	137	.	.	.
FTSSB001	0 - .3	MERCURY	.	.	.	93	.	0.52
FTSSB002	0 - .5	MERCURY	.	0.91	.	67	.	1.13
FTSSB003	0 - .2	MERCURY	.	.	.	51	.	0.64
FTSSB004	0 - .5	MERCURY	.	.	.	43	0.51	0.69
FTSSB005	0 - .5	MERCURY	.	.	.	18	0.05	0.57
FTSSB006	0 - .5	MERCURY	.	.	.	17	0.11	0.14
FTSSB007	0 - .2	MERCURY	.	0.17	.	9	0.19	0.57
FTSSB008	0 - .5	MERCURY	.	.	.	29	0.05	0.01
FTSSB009	0 - .1	MERCURY	.	.	.	44	0.31	0.59
RADSBA01	0 - .5	MERCURY	1	.	.	103	0.08	0.11
RADSBA07	0 - .5	MERCURY	1	.	.	26	0.31	1.12
RADSBB04	0 - .5	MERCURY	.	.	.	28	0.72	0.59
RADSBB06	0 - .5	MERCURY	.	0.4	.	16	1.35	0.55
RADSBD05	0 - .5	MERCURY	.	.	.	14	1.39	0.34
RADSBD06	0 - .5	MERCURY	.	1.4	.	20	1.32	0.31
RADSBE03	0 - .5	MERCURY	.	0.54	.	21	1.14	0.44

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSBF06	0 - .5	MERCURY	1			14	1.66	0.23
RADSBG04	0 - .5	MERCURY	0			35	1.7	1.27
RADSBG08	0 - .5	MERCURY				17	1.48	0.77
RADSBH06	0 - .5	MERCURY		0.73		42	1.16	0.72
RADSBI04	0 - .5	MERCURY		0.47		154	1.35	1.97
RADSBJ02	0 - .5	MERCURY				13	1.77	5.78
RADSBJ07	0 - .5	MERCURY				49	1.78	1.16
RADSBK08	0 - .5	MERCURY		1.1		21	0.05	0.36
RADSL001	0 - .5	MERCURY	2					
RADSL002	0 - .5	MERCURY	1					
WHSSBA04	0 - .5	MERCURY				60	0.09	0.01
WHSSBA06	0 - .5	MERCURY	6		1	37		1.34
WHSSBB03	0 - .5	MERCURY		0.11		51	0.22	0.48
WHSSBB07	0 - .5	MERCURY		0.19		10	1.5	0.33
WHSSBC02	0 - .5	MERCURY				26	1.16	0.22
WHSSBC08	0 - .5	MERCURY		0.42	1	103	0.05	0.19
WHSSBE02	0 - .5	MERCURY				50	2	0.95
WHSSBE06	0 - .5	MERCURY				119	2	1.04
WHSSBE08	0 - .5	MERCURY				17	0.09	0.03
WHSSBF03	0 - .5	MERCURY		3.6		135		1.01
WHSSBG06	0 - .5	MERCURY		1.8		150		1.09
WHSSBH07	0 - .5	MERCURY			1	67	1.84	0.42
WHSSBI02	0 - .5	MERCURY	1			92	0.02	0.15
WHSSBK06	0 - .5	MERCURY		1.1		136		0.88
WHSSBK08	0 - .5	MERCURY				28	1.67	0.69
WHSSL001	0 - .5	MERCURY						
WHSSL002	0 - .5	MERCURY						
WHSSL003	0 - .5	MERCURY	1					
FTSSB003	0 - .2	MOLYBDENU			9	51		0.64
FTSSB004	0 - .5	MOLYBDENU			9	43	0.51	0.69
FTSSB005	0 - .5	MOLYBDENU			9	18	0.05	0.57
RADSBA07	0 - .5	MOLYBDENU	54		7	26	0.31	1.12
RADSBB04	0 - .5	MOLYBDENU			9	28	0.72	0.59
RADSBB06	0 - .5	MOLYBDENU			5	16	1.35	0.55
RADSBE03	0 - .5	MOLYBDENU	3		3	21	1.14	0.44
RADSBH06	0 - .5	MOLYBDENU	1			42	1.16	0.72
RADSBJ07	0 - .5	MOLYBDENU	2			49	1.78	1.16
RADSL001	0 - .5	MOLYBDENU			13			
RADSL002	0 - .5	MOLYBDENU			7			
WHSSBA04	0 - .5	MOLYBDENU			3	60	0.09	0.01
WHSSBB03	0 - .5	MOLYBDENU			6	51	0.22	0.48
WHSSBB07	0 - .5	MOLYBDENU	1			10	1.5	0.33
WHSSBC02	0 - .5	MOLYBDENU			13	26	1.16	0.22
WHSSBC08	0 - .5	MOLYBDENU			3	103	0.05	0.19

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBD03	0 - .5	MOLYBDENU	.	.	8	77	0.25	0.37
WHSSBE02	0 - .5	MOLYBDENU	.	.	2	50	2	0.95
WHSSBE06	0 - .5	MOLYBDENU	.	.	2	119	2	1.04
WHSSBE08	0 - .5	MOLYBDENU	1	.	1	17	0.09	0.03
WHSSBF03	0 - .5	MOLYBDENU	.	.	20	135	.	1.01
WHSSBG06	0 - .5	MOLYBDENU	.	.	1	150	.	1.09
WHSSBI02	0 - .5	MOLYBDENU	1	.	.	92	0.02	0.15
WHSSBK06	0 - .5	MOLYBDENU	.	.	1	136	.	0.88
WHSSBK08	0 - .5	MOLYBDENU	1	.	7	28	1.67	0.69
WHSSBL05	0 - .5	MOLYBDENU	.	.	14	78	0.05	0.08
WHSSBM08	0 - .5	MOLYBDENU	2	.	.	13	0.05	0.34
WHSSL001	0 - .5	MOLYBDENU	1	.	.	.	.	.
WHSSL002	0 - .5	MOLYBDENU	2	.	2	.	.	.
WHSSL003	0 - .5	MOLYBDENU	3	.	10	.	.	.
FTSSB001	0 - .3	NICKEL	38	.	.	93	.	0.52
FTSSB002	0 - .5	NICKEL	29	591	.	67	.	1.13
FTSSB003	0 - .2	NICKEL	49	.	.	51	.	0.64
FTSSB004	0 - .5	NICKEL	62	.	.	43	0.51	0.69
FTSSB005	0 - .5	NICKEL	91	.	.	18	0.05	0.57
FTSSB006	0 - .5	NICKEL	53	.	.	17	0.11	0.14
FTSSB007	0 - .2	NICKEL	65	737	.	9	0.19	0.57
FTSSB008	0 - .5	NICKEL	41	.	.	29	0.05	0.01
FTSSB009	0 - .1	NICKEL	58	.	.	44	0.31	0.59
RADSBA01	0 - .5	NICKEL	78	.	19	103	0.08	0.11
RADSBA07	0 - .5	NICKEL	140	.	13	26	0.31	1.12
RADSBB04	0 - .5	NICKEL	79	1760	20	28	0.72	0.59
RADSBB06	0 - .5	NICKEL	54	1380	23	16	1.35	0.55
RADSBB08	0 - .5	NICKEL	49	.	6	49	1.91	3
RADSBC05	0 - .5	NICKEL	67	.	.	21	1.18	0.76
RADSBD05	0 - .5	NICKEL	81	.	4	14	1.39	0.34
RADSBD06	0 - .5	NICKEL	67	1920	9	20	1.32	0.31
RADSBE03	0 - .5	NICKEL	85	1070	21	21	1.14	0.44
RADSBF06	0 - .5	NICKEL	146	.	27	14	1.66	0.23
RADSBG04	0 - .5	NICKEL	54	.	29	35	1.7	1.27
RADSBG08	0 - .5	NICKEL	45	.	8	17	1.48	0.77
RADSBH06	0 - .5	NICKEL	78	1530	12	42	1.16	0.72
RADSBI02	0 - .5	NICKEL	54	.	11	39	1.49	1.56
RADSBI04	0 - .5	NICKEL	73	1410	45	154	1.35	1.97
RADSBI08	0 - .5	NICKEL	55	.	14	9	0.03	0.14
RADSBJ02	0 - .5	NICKEL	52	.	30	13	1.77	5.78
RADSBJ07	0 - .5	NICKEL	75	.	8	49	1.78	1.16
RADSBK08	0 - .5	NICKEL	86	1590	31	21	0.05	0.36
RADSBM08	0 - .5	NICKEL	87	.	10	134	0.07	0.76
RADSL001	0 - .5	NICKEL	61	1280	11	.	.	.

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSL002	0 - .5	NICKEL	98	1030	4			
WHSSBA04	0 - .5	NICKEL	54		6	60	0.09	0.01
WHSSBA06	0 - .5	NICKEL	17			37		1.34
WHSSBB03	0 - .5	NICKEL	38	725	20	51	0.22	0.48
WHSSBB07	0 - .5	NICKEL	35	594	579	10	1.5	0.33
WHSSBC02	0 - .5	NICKEL	57		13	26	1.16	0.22
WHSSBC08	0 - .5	NICKEL	100	3140	133	103	0.05	0.19
WHSSBD03	0 - .5	NICKEL	59		5	77	0.25	0.37
WHSSBE02	0 - .5	NICKEL	26		4	50	2	0.95
WHSSBE06	0 - .5	NICKEL	32		9	119	2	1.04
WHSSBE08	0 - .5	NICKEL	18		6	17	0.09	0.03
WHSSBF03	0 - .5	NICKEL	35	494	12	135		1.01
WHSSBG06	0 - .5	NICKEL	41	1290		150		1.09
WHSSBH07	0 - .5	NICKEL	44		32	67	1.84	0.42
WHSSBI02	0 - .5	NICKEL	88		21	92	0.02	0.15
WHSSBK06	0 - .5	NICKEL	27	1080	13	136		0.88
WHSSBK08	0 - .5	NICKEL	73		6	28	1.67	0.69
WHSSBL05	0 - .5	NICKEL	61			78	0.05	0.08
WHSSBM08	0 - .5	NICKEL	53		16	13	0.05	0.34
WHSSL001	0 - .5	NICKEL	96	879	34			
WHSSL002	0 - .5	NICKEL	91	936	22			
WHSSL003	0 - .5	NICKEL	76	849	8			
FTSSB001	0 - .3	POTASSIUM	1860		921	93		0.52
FTSSB002	0 - .5	POTASSIUM	2640	54700	11600	67		1.13
FTSSB003	0 - .2	POTASSIUM	3180		15200	51		0.64
FTSSB004	0 - .5	POTASSIUM	3830		15400	43	0.51	0.69
FTSSB005	0 - .5	POTASSIUM	6510		34600	18	0.05	0.57
FTSSB006	0 - .5	POTASSIUM	2930		26200	17	0.11	0.14
FTSSB007	0 - .2	POTASSIUM	2610	81600	41400	9	0.19	0.57
FTSSB008	0 - .5	POTASSIUM	2940		21900	29	0.05	0.01
FTSSB009	0 - .1	POTASSIUM	3080		8720	44	0.31	0.59
RADSBA01	0 - .5	POTASSIUM	4150		10900	103	0.08	0.11
RADSBA07	0 - .5	POTASSIUM	3760		7960	26	0.31	1.12
RADSBB04	0 - .5	POTASSIUM	3860	53300	4590	28	0.72	0.59
RADSBB06	0 - .5	POTASSIUM	2670	43900	8600	16	1.35	0.55
RADSBB08	0 - .5	POTASSIUM	2790		9630	49	1.91	3
RADSBC05	0 - .5	POTASSIUM	2710		11800	21	1.18	0.76
RADSBD05	0 - .5	POTASSIUM	4520		19800	14	1.39	0.34
RADSBD06	0 - .5	POTASSIUM	4300	84400	9160	20	1.32	0.31
RADSBE03	0 - .5	POTASSIUM	7610	66100	13600	21	1.14	0.44
RADSBF06	0 - .5	POTASSIUM	3170		27300	14	1.66	0.23
RADSBG04	0 - .5	POTASSIUM	4010		19700	35	1.7	1.27
RADSBG08	0 - .5	POTASSIUM	3450		39800	17	1.48	0.77
RADSBH06	0 - .5	POTASSIUM	5920	62600	12200	42	1.16	0.72

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSBI02	0 - .5	POTASSIUM	2870		15300	39	1.49	1.56
RADSBI04	0 - .5	POTASSIUM	5390	71700	30700	154	1.35	1.97
RADSBI08	0 - .5	POTASSIUM	1950		13600	9	0.03	0.14
RADSBJ02	0 - .5	POTASSIUM	2720		16800	13	1.77	5.78
RADSBJ07	0 - .5	POTASSIUM	5750		49000	49	1.78	1.16
RADSBK08	0 - .5	POTASSIUM	3270	63300	8020	21	0.05	0.36
RADSBM08	0 - .5	POTASSIUM	3660		9030	134	0.07	0.76
RADSL001	0 - .5	POTASSIUM	2760	50500	7330			
RADSL002	0 - .5	POTASSIUM	4900	45000	5880			
WHSSBA04	0 - .5	POTASSIUM	5130		2780	60	0.09	0.01
WHSSBA06	0 - .5	POTASSIUM	642		2250	37		1.34
WHSSBB03	0 - .5	POTASSIUM	3580	87600	11800	51	0.22	0.48
WHSSBB07	0 - .5	POTASSIUM	1870	52400	49000	10	1.5	0.33
WHSSBC02	0 - .5	POTASSIUM	3690		19600	26	1.16	0.22
WHSSBC08	0 - .5	POTASSIUM	2840	61100	6990	103	0.05	0.19
WHSSBD03	0 - .5	POTASSIUM	3510		1000	77	0.25	0.37
WHSSBE02	0 - .5	POTASSIUM	1500		8380	50	2	0.95
WHSSBE06	0 - .5	POTASSIUM	1480		4910	119	2	1.04
WHSSBE08	0 - .5	POTASSIUM	1320		5860	17	0.09	0.03
WHSSBF03	0 - .5	POTASSIUM	2350	50200	6140	135		1.01
WHSSBG06	0 - .5	POTASSIUM	1290	16600	980	150		1.09
WHSSBH07	0 - .5	POTASSIUM	2230		5640	67	1.84	0.42
WHSSBI02	0 - .5	POTASSIUM	5760		24200	92	0.02	0.15
WHSSBK06	0 - .5	POTASSIUM	1220	38200	7110	136		0.88
WHSSBK08	0 - .5	POTASSIUM	3360		6570	28	1.67	0.69
WHSSBL05	0 - .5	POTASSIUM	3620		21100	78	0.05	0.08
WHSSBM08	0 - .5	POTASSIUM	1940		6830	13	0.05	0.34
WHSSL001	0 - .5	POTASSIUM	4190	50600	18100			
WHSSL002	0 - .5	POTASSIUM	4310	58700	25500			
WHSSL003	0 - .5	POTASSIUM	4070	61500	23000			
RADSBK08	0 - .5	SELENIUM			4	21	0.05	0.36
WHSSBL05	0 - .5	SELENIUM			4	78	0.05	0.08
WHSSBM08	0 - .5	SELENIUM			4	13	0.05	0.34
WHSSL003	0 - .5	SELENIUM	1					
FTSSB002	0 - .5	SILVER		1.3		67		1.13
FTSSB003	0 - .2	SILVER			3	51		0.64
FTSSB004	0 - .5	SILVER			2	43	0.51	0.69
FTSSB005	0 - .5	SILVER			1	18	0.05	0.57
FTSSB006	0 - .5	SILVER	1		1	17	0.11	0.14
FTSSB007	0 - .2	SILVER		0	1	9	0.19	0.57
FTSSB009	0 - .1	SILVER			1	44	0.31	0.59
RADSBB06	0 - .5	SILVER		2		16	1.35	0.55
RADSBF06	0 - .5	SILVER	1			14	1.66	0.23
WHSSBB07	0 - .5	SILVER		1.7	2	10	1.5	0.33

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBD03	0 - .5	SILVER	0		2	77	0.25	0.37
WHSSBE08	0 - .5	SILVER				17	0.09	0.03
WHSSBM08	0 - .5	SILVER				13	0.05	0.34
FTSSB001	0 - .3	SODIUM	1610		64400	93		0.52
FTSSB002	0 - .5	SODIUM	2680	146000	111000	67		1.13
FTSSB003	0 - .2	SODIUM	3490		122000	51		0.64
FTSSB004	0 - .5	SODIUM	4610		146000	43	0.51	0.69
FTSSB005	0 - .5	SODIUM	11900		376000	18	0.05	0.57
FTSSB006	0 - .5	SODIUM	7810		246000	17	0.11	0.14
FTSSB007	0 - .2	SODIUM	17700	1230000	901000	9	0.19	0.57
FTSSB008	0 - .5	SODIUM	4890		267000	29	0.05	0.01
FTSSB009	0 - .1	SODIUM	1270		52700	44	0.31	0.59
RADSBA01	0 - .5	SODIUM	2780		68300	103	0.08	0.11
RADSBA07	0 - .5	SODIUM	4770		99500	26	0.31	1.12
RADSBB04	0 - .5	SODIUM	1960	74100	37200	28	0.72	0.59
RADSBB06	0 - .5	SODIUM	5980	197000	143000	16	1.35	0.55
RADSBB08	0 - .5	SODIUM			2260	49	1.91	3
RADSBC05	0 - .5	SODIUM	4760		280000	21	1.18	0.76
RADSBD05	0 - .5	SODIUM	9270		406000	14	1.39	0.34
RADSBD06	0 - .5	SODIUM	4440	253000	167000	20	1.32	0.31
RADSBE03	0 - .5	SODIUM	10100	280000	205000	21	1.14	0.44
RADSBF06	0 - .5	SODIUM	13300		319000	14	1.66	0.23
RADSBG04	0 - .5	SODIUM	7530		419000	35	1.7	1.27
RADSBG08	0 - .5	SODIUM	6800		370000	17	1.48	0.77
RADSBH06	0 - .5	SODIUM	4860	218000	219000	42	1.16	0.72
RADSBI02	0 - .5	SODIUM	3040		207000	39	1.49	1.56
RADSBI04	0 - .5	SODIUM	12200	601000	616000	154	1.35	1.97
RADSBI08	0 - .5	SODIUM	3340		182000	9	0.03	0.14
RADSBJ02	0 - .5	SODIUM	4960		363000	13	1.77	5.78
RADSBJ07	0 - .5	SODIUM	10200		521000	49	1.78	1.16
RADSBK08	0 - .5	SODIUM	3240	156000	97400	21	0.05	0.36
RADSBM08	0 - .5	SODIUM	4410		180000	134	0.07	0.76
RADSL001	0 - .5	SODIUM	3240	119000	78800			
RADSL002	0 - .5	SODIUM	2610	57400	35500			
WHSSBA04	0 - .5	SODIUM	5270		104000	60	0.09	0.01
WHSSBA06	0 - .5	SODIUM	2520		96000	37		1.34
WHSSBB03	0 - .5	SODIUM	4340	298000	170000	51	0.22	0.48
WHSSBB07	0 - .5	SODIUM	1970	163000	149000	10	1.5	0.33
WHSSBC02	0 - .5	SODIUM	10300		245000	26	1.16	0.22
WHSSBC08	0 - .5	SODIUM	4260	357000	102000	103	0.05	0.19
WHSSBD03	0 - .5	SODIUM	7790		106000	77	0.25	0.37
WHSSBE02	0 - .5	SODIUM	4180		255000	50	2	0.95
WHSSBE06	0 - .5	SODIUM	999		55500	119	2	1.04
WHSSBE08	0 - .5	SODIUM	3690		118000	17	0.09	0.03

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
WHSSBF03	0 - .5	SODIUM	2490	223000	107000	135		1.01
WHSSBG06	0 - .5	SODIUM	4090	269000	187000	150		1.09
WHSSBH07	0 - .5	SODIUM	3520		121000	67	1.84	0.42
WHSSBI02	0 - .5	SODIUM	4950		114000	92	0.02	0.15
WHSSBK06	0 - .5	SODIUM	1540	150000	103000	136		0.88
WHSSBK08	0 - .5	SODIUM	2730		103000	28	1.67	0.69
WHSSBL05	0 - .5	SODIUM	2050		97100	78	0.05	0.08
WHSSBM08	0 - .5	SODIUM	1140		52400	13	0.05	0.34
WHSSL001	0 - .5	SODIUM	2470	79800	66700			
WHSSL002	0 - .5	SODIUM	5430	176000	133000			
WHSSL003	0 - .5	SODIUM	6190	253000	231000			
FTSSB002	0 - .5	THALLIUM		21.6		67		1.13
FTSSB007	0 - .2	THALLIUM		73.1		9	0.19	0.57
RADSBC05	0 - .5	THALLIUM	2			21	1.18	0.76
RADSBD05	0 - .5	THALLIUM	1			14	1.39	0.34
RADSBD06	0 - .5	THALLIUM		31.3		20	1.32	0.31
RADSBK08	0 - .5	THALLIUM		50.5		21	0.05	0.36
WHSSBC08	0 - .5	THALLIUM	2			103	0.05	0.19
WHSSBD03	0 - .5	THALLIUM	2			77	0.25	0.37
WHSSBF03	0 - .5	THALLIUM	1	9.9		135		1.01
WHSSBG06	0 - .5	THALLIUM		12.2		150		1.09
WHSSBH07	0 - .5	THALLIUM	1			67	1.84	0.42
WHSSBI02	0 - .5	THALLIUM			4	92	0.02	0.15
WHSSBK06	0 - .5	THALLIUM		20.4		136		0.88
WHSSBL05	0 - .5	THALLIUM	1			78	0.05	0.08
WHSSL002	0 - .5	THALLIUM		4.3				
FTSSB001	0 - .3	VANADIUM	55		56	93		0.52
FTSSB002	0 - .5	VANADIUM	40	1130	49	67		1.13
FTSSB003	0 - .2	VANADIUM	57		22	51		0.64
FTSSB004	0 - .5	VANADIUM	57		41	43	0.51	0.69
FTSSB005	0 - .5	VANADIUM	113		5	18	0.05	0.57
FTSSB006	0 - .5	VANADIUM	68		7	17	0.11	0.14
FTSSB007	0 - .2	VANADIUM	38	738	9	9	0.19	0.57
FTSSB008	0 - .5	VANADIUM	40		35	29	0.05	0.01
FTSSB009	0 - .1	VANADIUM	51		37	44	0.31	0.59
RADSBA01	0 - .5	VANADIUM	77		97	103	0.08	0.11
RADSBA07	0 - .5	VANADIUM	97		10	26	0.31	1.12
RADSBB04	0 - .5	VANADIUM	61	1430	34	28	0.72	0.59
RADSBB06	0 - .5	VANADIUM	53	1480	32	16	1.35	0.55
RADSBB08	0 - .5	VANADIUM	62		17	49	1.91	3
RADSBC05	0 - .5	VANADIUM	51		23	21	1.18	0.76
RADSBD05	0 - .5	VANADIUM	47		6	14	1.39	0.34
RADSBD06	0 - .5	VANADIUM	46	1870	34	20	1.32	0.31
RADSBE03	0 - .5	VANADIUM	130	2850	36	21	1.14	0.44

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSBF06	0 - .5	VANADIUM	56		3	14	1.66	0.23
RADSBG04	0 - .5	VANADIUM	64			35	1.7	1.27
RADSBG08	0 - .5	VANADIUM	48		18	17	1.48	0.77
RADSBH06	0 - .5	VANADIUM	87	2250	10	42	1.16	0.72
RADSBI02	0 - .5	VANADIUM	55			39	1.49	1.56
RADSBI04	0 - .5	VANADIUM	79	1870		154	1.35	1.97
RADSBI08	0 - .5	VANADIUM	40		12	9	0.03	0.14
RADSBJ02	0 - .5	VANADIUM	47		1	13	1.77	5.78
RADSBJ07	0 - .5	VANADIUM	73		7	49	1.78	1.16
RADSBK08	0 - .5	VANADIUM	59	1550	147	21	0.05	0.36
RADSBM08	0 - .5	VANADIUM	62		10	134	0.07	0.76
RADSL001	0 - .5	VANADIUM	55	1540	86			
RADSL002	0 - .5	VANADIUM	105	1610	22			
WHSSBA04	0 - .5	VANADIUM	62		48	60	0.09	0.01
WHSSBA06	0 - .5	VANADIUM	83		21	37		1.34
WHSSBB03	0 - .5	VANADIUM	50	1360	73	51	0.22	0.48
WHSSBB07	0 - .5	VANADIUM	70	1130	1090	10	1.5	0.33
WHSSBC02	0 - .5	VANADIUM	100		55	26	1.16	0.22
WHSSBC08	0 - .5	VANADIUM	91	2280	305	103	0.05	0.19
WHSSBD03	0 - .5	VANADIUM	84		22	77	0.25	0.37
WHSSBE02	0 - .5	VANADIUM	41		24	50	2	0.95
WHSSBE06	0 - .5	VANADIUM	40		13	119	2	1.04
WHSSBE08	0 - .5	VANADIUM	33		6	17	0.09	0.03
WHSSBF03	0 - .5	VANADIUM	41	745	72	135		1.01
WHSSBG06	0 - .5	VANADIUM	36	1570	50	150		1.09
WHSSBH07	0 - .5	VANADIUM	65		31	67	1.84	0.42
WHSSBI02	0 - .5	VANADIUM	99		1	92	0.02	0.15
WHSSBK06	0 - .5	VANADIUM	42	1550	24	136		0.88
WHSSBK08	0 - .5	VANADIUM	70		23	28	1.67	0.69
WHSSBL05	0 - .5	VANADIUM	63		1	78	0.05	0.08
WHSSBM08	0 - .5	VANADIUM	42		85	13	0.05	0.34
WHSSL001	0 - .5	VANADIUM	103	1590	48			
WHSSL002	0 - .5	VANADIUM	92	1360	30			
WHSSL003	0 - .5	VANADIUM	119	1790	2			
FTSSB001	0 - .3	ZINC	106		38	93		0.52
FTSSB002	0 - .5	ZINC	436	7870	102	67		1.13
FTSSB003	0 - .2	ZINC	160		37	51		0.64
FTSSB004	0 - .5	ZINC	173		42	43	0.51	0.69
FTSSB005	0 - .5	ZINC	213		5	18	0.05	0.57
FTSSB006	0 - .5	ZINC	144		18	17	0.11	0.14
FTSSB007	0 - .2	ZINC	59	1680	3	9	0.19	0.57
FTSSB008	0 - .5	ZINC	115		35	29	0.05	0.01
FTSSB009	0 - .1	ZINC	118		22	44	0.31	0.59
RADSBA01	0 - .5	ZINC	241		66	103	0.08	0.11

CORRELATION DATA INPUT FILE
NWSBD CONCORD TIDAL AREA

PT_ID	SAMPLE DEPTH	ANALYTE	TOTAL METAL (mg/kg)	WET ACID (ug/L)	WET DI (ug/L)	P450 (%)	MICROTOX ORGANIC EXTRACT	MICROTOX SOLID PHASE
RADSBA07	0 - .5	ZINC	496		0	26	0.31	1.12
RADSBB04	0 - .5	ZINC	135	3830	61	28	0.72	0.59
RADSBB06	0 - .5	ZINC	94	3080	59	16	1.35	0.55
RADSBB08	0 - .5	ZINC	88			49	1.91	3
RADSBC05	0 - .5	ZINC	96			21	1.18	0.76
RADSBD05	0 - .5	ZINC	172			14	1.39	0.34
RADSBD06	0 - .5	ZINC	179	9150	55	20	1.32	0.31
RADSBE03	0 - .5	ZINC	137	1670	39	21	1.14	0.44
RADSBF06	0 - .5	ZINC	143		52	14	1.66	0.23
RADSBG04	0 - .5	ZINC	80		29	35	1.7	1.27
RADSBG08	0 - .5	ZINC	115			17	1.48	0.77
RADSBH06	0 - .5	ZINC	138	2870	24	42	1.16	0.72
RADSBI02	0 - .5	ZINC	71			39	1.49	1.56
RADSBI04	0 - .5	ZINC	111	2420	47	154	1.35	1.97
RADSBI08	0 - .5	ZINC	68			9	0.03	0.14
RADSBJ02	0 - .5	ZINC	62		24	13	1.77	5.78
RADSBJ07	0 - .5	ZINC	100			49	1.78	1.16
RADSBK08	0 - .5	ZINC	98	3660	88	21	0.05	0.36
RADSBM08	0 - .5	ZINC	99			134	0.07	0.76
RADSL001	0 - .5	ZINC	178	6980				
RADSL002	0 - .5	ZINC	214	3250				
WHSSBA04	0 - .5	ZINC	69		136	60	0.09	0.01
WHSSBA06	0 - .5	ZINC	84		9	37		1.34
WHSSBB03	0 - .5	ZINC	198	15800	132	51	0.22	0.48
WHSSBB07	0 - .5	ZINC	194	9120	8500	10	1.5	0.33
WHSSBC02	0 - .5	ZINC	338		22	26	1.16	0.22
WHSSBC08	0 - .5	ZINC	90	3360	69	103	0.05	0.19
WHSSBD03	0 - .5	ZINC	417		52	77	0.25	0.37
WHSSBE02	0 - .5	ZINC	89		25	50	2	0.95
WHSSBE06	0 - .5	ZINC	155		67	119	2	1.04
WHSSBE08	0 - .5	ZINC	244		62	17	0.09	0.03
WHSSBF03	0 - .5	ZINC	285	1810	421	135		1.01
WHSSBG06	0 - .5	ZINC	36	814	16	150		1.09
WHSSBH07	0 - .5	ZINC	79		83	67	1.84	0.42
WHSSBI02	0 - .5	ZINC	3010		879	92	0.02	0.15
WHSSBK06	0 - .5	ZINC	55	2110	55	136		0.88
WHSSBK08	0 - .5	ZINC	88		847	28	1.67	0.69
WHSSBL05	0 - .5	ZINC	95		11	78	0.05	0.08
WHSSBM08	0 - .5	ZINC	70		71	13	0.05	0.34
WHSSL001	0 - .5	ZINC	203	4430	1350			
WHSSL002	0 - .5	ZINC	200	5780	823			
WHSSL003	0 - .5	ZINC	107	3890	832			

Blank cell - analyte was detected or not analyzed

ALUMINUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	17131.15	7037.5407	52
WETDI	8952.7872	50869.32	47
WETACID	191045.0	96617.85	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	-.053	.358	.015	-.008	-.001
	WETDI	-.053	1.000	.421	.153	-.081	-.154
	WETACID	.358	.421	1.000	.302	-.209	-.100
	MTOE	.015	.153	.302	1.000	.470**	-.078
	MTSP	-.008	-.081	-.209	.470**	1.000	.043
	P450	-.001	-.154	-.100	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.723	.121	.929	.956	.994
	WETDI	.723	.	.064	.380	.612	.331
	WETACID	.121	.064	.	.367	.454	.723
	MTOE	.929	.380	.367	.	.002	.632
	MTSP	.956	.612	.454	.002	.	.773
	P450	.994	.331	.723	.632	.773	.
Sum of Squares and Cross-products	TMETAL	2.5E+09	-8.9E+08	5.4E+09	2735.338	-2185.703	-14374.5
	WETDI	-8.9E+08	1.2E+11	6.0E+10	224653.3	-161960	-1.5E+07
	WETACID	5.4E+09	6.0E+10	1.8E+11	169049.1	-135948	-7909200
	MTOE	2735.338	224653.3	169049.1	21.188	13.539	-82.594
	MTSP	-2185.703	-161960	-135948	13.539	39.824	77.618
	P450	-14374.5	-1.5E+07	-7909200	-82.594	77.618	80874.979
Covariance	TMETAL	5.0E+07	-1.9E+07	2.9E+08	70.137	-47.515	-312.488
	WETDI	-1.9E+07	2.6E+09	3.2E+09	6607.451	-3950.237	-356361
	WETACID	2.9E+08	3.2E+09	9.3E+09	16904.909	-9710.571	-564943
	MTOE	70.137	6607.451	16904.909	.543	.347	-2.118
	MTSP	-47.515	-3950.237	-9710.571	.347	.866	1.687
	P450	-312.488	-356361	-564943	-2.118	1.687	1758.152
N	TMETAL	52	47	20	40	47	47
	WETDI	47	47	20	35	42	42
	WETACID	20	20	20	11	15	15
	MTOE	40	35	11	40	40	40
	MTSP	47	42	15	40	47	47
	P450	47	42	15	40	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

ALUMINUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	-.051	.626**	.009	.038	.143
		WETDI	-.051	1.000	.276	.019	-.176	.173
		WETACID	.626**	.276	1.000	.219	-.421	-.005
		MTOE	.009	.019	.219	1.000	.628**	.005
		MTSP	.038	-.176	-.421	.628**	1.000	.228
		P450	.143	.173	-.005	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.732	.003	.955	.798	.339
		WETDI	.732	.	.239	.915	.266	.274
		WETACID	.003	.239	.	.518	.118	.985
		MTOE	.955	.915	.518	.	.000	.976
		MTSP	.798	.266	.118	.000	.	.123
		P450	.339	.274	.985	.976	.123	.
	N	TMETAL	52	47	20	40	47	47
		WETDI	47	47	20	35	42	42
		WETACID	20	20	20	11	15	15
		MTOE	40	35	11	40	40	40
		MTSP	47	42	15	40	47	47
		P450	47	42	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

ANTIMONY

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	2.0000	1.6777	28
WETDI	4.2500	2.4083	16
WETACID	7.7000	2.5236	8
MTOE	.9841	.7748	26
MTSP	.8851	1.0799	33
P450	60.1212	42.7359	33

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.416	-.056	-.406	-.269	-.202
	WETDI	.416	1.000	.716	-.356	-.326	-.271
	WETACID	-.056	.716	1.000	.126	-.725	-.293
	MTOE	-.406	-.356	.126	1.000	.480*	-.116
	MTSP	-.269	-.326	-.725	.480*	1.000	-.041
	P450	-.202	-.271	-.293	-.116	-.041	1.000
Sig. (2-tailed)	TMETAL	.	.305	.905	.061	.193	.332
	WETDI	.305	.	.492	.313	.218	.309
	WETACID	.905	.492	.	.919	.166	.632
	MTOE	.061	.313	.919	.	.013	.573
	MTSP	.193	.218	.166	.013	.	.823
	P450	.332	.309	.632	.573	.823	.
Sum of Squares and Cross-products	TMETAL	76.000	18.625	-.557	-12.268	-8.030	-387.000
	WETDI	18.625	87.000	7.333	-7.608	-16.044	-422.000
	WETACID	-.557	7.333	44.580	.245	-2.939	-156.320
	MTOE	-12.268	-7.608	.245	15.009	11.288	-83.889
	MTSP	-8.030	-16.044	-2.939	11.288	37.318	-59.849
	P450	-387.000	-422.000	-156.320	-83.889	-59.849	58443.515
Covariance	TMETAL	2.815	2.661	-9.29E-02	-.584	-.335	-16.125
	WETDI	2.661	5.800	3.667	-.845	-1.070	-28.133
	WETACID	-9.29E-02	3.667	6.369	.123	-.735	-39.080
	MTOE	-.584	-.845	.123	.600	.452	-3.356
	MTSP	-.335	-1.070	-.735	.452	1.166	-1.870
	P450	-16.125	-28.133	-39.080	-3.356	-1.870	1826.360
N	TMETAL	28	8	7	22	25	25
	WETDI	8	16	3	10	16	16
	WETACID	7	3	8	3	5	5
	MTOE	22	10	3	26	26	26
	MTSP	25	16	5	26	33	33
	P450	25	16	5	26	33	33

*. Correlation is significant at the 0.05 level (2-tailed).

ANTIMONY

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.414	.134	-.277	-.414*	-.214
		WETDI	.414	1.000	.866	.009	-.255	-.106
		WETACID	.134	.866	1.000	-.500	-.700	-.300
		MTOE	-.277	.009	-.500	1.000	.681**	-.120
		MTSP	-.414*	-.255	-.700	.681**	1.000	.098
		P450	-.214	-.106	-.300	-.120	.098	1.000
	Sig. (2-tailed)	TMETAL	.	.307	.775	.211	.039	.304
		WETDI	.307	.	.333	.980	.341	.696
		WETACID	.775	.333	.	.667	.188	.624
		MTOE	.211	.980	.667	.	.000	.560
		MTSP	.039	.341	.188	.000	.	.587
		P450	.304	.696	.624	.560	.587	.
	N	TMETAL	28	8	7	22	25	25
		WETDI	8	16	3	10	16	16
		WETACID	7	3	8	3	5	5
		MTOE	22	10	3	26	26	26
		MTSP	25	16	5	26	33	33
		P450	25	16	5	26	33	33

*. Correlation is significant at the .05 level (2-tailed).

**. Correlation is significant at the .01 level (2-tailed).

ARSENIC

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	11.5417	8.0661	48
WETDI	16.3056	13.5790	36
WETACID	105.5944	108.5789	18
MTOE	.8279	.7289	39
MTSP	.7702	.9460	45
P450	52.0222	42.7533	45

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.152	.495*	-.248	-.126	-.178
	WETDI	.152	1.000	-.289	-.173	-.391*	-.099
	WETACID	.495*	-.289	1.000	.469	.248	-.172
	MTOE	-.248	-.173	.469	1.000	.494**	-.103
	MTSP	-.126	-.391*	.248	.494**	1.000	.051
	P450	-.178	-.099	-.172	-.103	.051	1.000
Sig. (2-tailed)	TMETAL	.	.392	.043	.140	.421	.254
	WETDI	.392	.	.317	.378	.024	.583
	WETACID	.043	.317	.	.145	.374	.540
	MTOE	.140	.378	.145	.	.001	.534
	MTSP	.421	.024	.374	.001	.	.738
	P450	.254	.583	.540	.534	.738	.
Sum of Squares and Cross-products	TMETAL	3057.917	595.353	6633.506	-54.197	-40.976	-2564.465
	WETDI	595.353	6453.639	-5028.829	-46.702	-90.990	-1683.545
	WETACID	6633.506	-5028.829	200412.2	346.125	181.683	-15340.2
	MTOE	-54.197	-46.702	346.125	20.189	13.868	-105.468
	MTSP	-40.976	-90.990	181.683	13.868	39.377	91.423
	P450	-2564.465	-1683.545	-15340.2	-105.468	91.423	80424.978
Covariance	TMETAL	65.062	18.041	414.594	-1.505	-.976	-61.059
	WETDI	18.041	184.390	-386.833	-1.730	-2.843	-52.611
	WETACID	414.594	-386.833	11788.953	34.612	12.977	-1095.731
	MTOE	-1.505	-1.730	34.612	.531	.365	-2.775
	MTSP	-.976	-2.843	12.977	.365	.895	2.078
	P450	-61.059	-52.611	-1095.731	-2.775	2.078	1827.840
N	TMETAL	48	34	17	37	43	43
	WETDI	34	36	14	28	33	33
	WETACID	17	14	18	11	15	15
	MTOE	37	28	11	39	39	39
	MTSP	43	33	15	39	45	45
	P450	43	33	15	39	45	45

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

ARSENIC

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.265	.190	-.324	-.198	-.180
		WETDI	.265	1.000	-.390	-.528**	-.591**	-.085
		WETACID	.190	-.390	1.000	.510	.214	-.252
		MTOE	-.324	-.528**	.510	1.000	.656**	-.032
		MTSP	-.198	-.591**	.214	.656**	1.000	.249
		P450	-.180	-.085	-.252	-.032	.249	1.000
	Sig. (2-tailed)	TMETAL	.	.130	.464	.051	.202	.248
		WETDI	.130	.	.168	.004	.000	.639
		WETACID	.464	.168	.	.109	.443	.365
		MTOE	.051	.004	.109	.	.000	.846
		MTSP	.202	.000	.443	.000	.	.099
		P450	.248	.639	.365	.846	.099	.
	N	TMETAL	48	34	17	37	43	43
		WETDI	34	36	14	28	33	33
		WETACID	17	14	18	11	15	15
		MTOE	37	28	11	39	39	39
		MTSP	43	33	15	39	45	45
		P450	43	33	15	39	45	45

**. Correlation is significant at the .01 level (2-tailed).

BARIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	125.4231	60.7200	52
WETDI	237.9423	579.5027	52
WETACID	5568.7500	4447.0664	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	-.026	.629**	-.345*	-.178	.220
	WETDI	-.026	1.000	-.247	.157	-.094	-.129
	WETACID	.629**	-.247	1.000	-.716*	-.078	.544*
	MTOE	-.345*	.157	-.716*	1.000	.470**	-.078
	MTSP	-.178	-.094	-.078	.470**	1.000	.043
	P450	.220	-.129	.544*	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.855	.003	.029	.232	.137
	WETDI	.855	.	.294	.333	.528	.389
	WETACID	.003	.294	.	.013	.782	.036
	MTOE	.029	.333	.013	.	.002	.632
	MTSP	.232	.528	.782	.002	.	.773
	P450	.137	.389	.036	.632	.773	.
Sum of Squares and Cross-products	TMETAL	188032.7	-46670.7	3240341	-616.952	-471.986	26360.872
	WETDI	-46670.7	1.7E+07	-1.8E+07	2579.763	-2133.811	-130879
	WETACID	3240341	-1.8E+07	3.8E+08	-17098.7	-2312.140	1956459
	MTOE	-616.952	2579.763	-17098.7	21.188	13.539	-82.594
	MTSP	-471.986	-2133.811	-2312.140	13.539	39.824	77.618
	P450	26360.872	-130879	1956459	-82.594	77.618	80874.979
Covariance	TMETAL	3686.916	-915.112	170544.3	-15.819	-10.261	573.062
	WETDI	-915.112	335823.4	-921204	66.148	-46.387	-2845.198
	WETACID	170544.3	-921204	2.0E+07	-1709.868	-165.153	139747.1
	MTOE	-15.819	66.148	-1709.868	.543	.347	-2.118
	MTSP	-10.261	-46.387	-165.153	.347	.866	1.687
	P450	573.062	-2845.198	139747.1	-2.118	1.687	1758.152
N	TMETAL	52	52	20	40	47	47
	WETDI	52	52	20	40	47	47
	WETACID	20	20	20	11	15	15
	MTOE	40	40	11	40	40	40
	MTSP	47	47	15	40	47	47
	P450	47	47	15	40	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

BARIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.600**	.605**	-.362*	-.155	.258
		WETDI	.600**	1.000	.105	-.228	-.219	.110
		WETACID	.605**	.105	1.000	-.469	.039	.472
		MTOE	-.362*	-.228	-.469	1.000	.628**	.005
		MTSP	-.155	-.219	.039	.628**	1.000	.228
		P450	.258	.110	.472	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.000	.005	.022	.299	.080
		WETDI	.000	.	.661	.157	.138	.462
		WETACID	.005	.661	.	.145	.889	.076
		MTOE	.022	.157	.145	.	.000	.976
		MTSP	.299	.138	.889	.000	.	.123
		P450	.080	.462	.076	.976	.123	.
	N	TMETAL	52	52	20	40	47	47
		WETDI	52	52	20	40	47	47
		WETACID	20	20	20	11	15	15
		MTOE	40	40	11	40	40	40
		MTSP	47	47	15	40	47	47
		P450	47	47	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

BERYLLIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	1.0000	.0000	4
WETDI	.	.	0
WETACID	8.6907	5.0719	15
MTOE	1.1232	.7462	11
MTSP	.8260	.4656	15
P450	74.0000	49.8010	15

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	WETDI	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	WETACID	.[a]	.[a]	1.000	.654	.015	.318
	MTOE	.[a]	.[a]	.654	1.000	.597	.297
	MTSP	.[a]	.[a]	.015	.597	1.000	.662**
	P450	.[a]	.[a]	.318	.297	.662**	1.000
Sig. (2-tailed)	TMETAL	.	.	.	.	.	.
	WETDI	.	.	.	.	.	.
	WETACID	.	.	.	.159	.966	.371
	MTOE	.	.	.159	.	.052	.374
	MTSP	.	.	.966	.052	.	.007
	P450	.	.	.371	.374	.007	.
Sum of Squares and Cross-products	TMETAL	.000	.	.000	.000	.000	.000
	WETDI	.	.	.	.	.	.
	WETACID	.000	.	360.142	9.035	.294	698.620
	MTOE	.000	.	9.035	5.568	2.349	94.106
	MTSP	.000	.	.294	2.349	3.035	214.780
	P450	.000	.	698.620	94.106	214.780	34722.000
Covariance	TMETAL	.000	.	.000	.	.	.
	WETDI	.	.	.	.	.	.
	WETACID	.000	.	25.724	1.807	3.269E-02	77.624
	MTOE	.	.	1.807	.557	.235	9.411
	MTSP	.	.	3.269E-02	.235	.217	15.341
	P450	.	.	77.624	9.411	15.341	2480.143
N	TMETAL	4	0	3	1	1	1
	WETDI	0	0	0	0	0	0
	WETACID	3	0	15	6	10	10
	MTOE	1	0	6	11	11	11
	MTSP	1	0	10	11	15	15
	P450	1	0	10	11	15	15

**. Correlation is significant at the 0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

BERYLLIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	.	.	.	.	.	.
		WETDI	.	.	.	.	.	.
		WETACID	.	.	1.000	.657	.055	.067
		MTOE	.	.	.657	1.000	.743**	.279
		MTSP	.	.	.055	.743**	1.000	.634*
		P450	.	.	.067	.279	.634*	1.000
	Sig. (2-tailed)	TMETAL	.	.	.	.	.	.
		WETDI	.	.	.	.	.	.
		WETACID	.	.	.	.156	.881	.855
		MTOE	.	.	.156	.	.009	.407
		MTSP	.	.	.881	.009	.	.011
		P450	.	.	.855	.407	.011	.
	N	TMETAL	4	0	3	1	1	1
		WETDI	0	0	0	0	0	0
		WETACID	3	0	15	6	10	10
		MTOE	1	0	6	11	11	11
		MTSP	1	0	10	11	15	15
		P450	1	0	10	11	15	15

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

CADMIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	5.6000	8.7063	5
WETDI	2.0000	1.0000	3
WETACID	22.8643	15.0397	14
MTOE	.7035	.6628	10
MTSP	.5573	.2875	15
P450	51.8667	43.4279	15

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.[a]	-1.000**	-1.000**	-.616	.376
	WETDI	.[a]	1.000	.537	.[a]	1.000**	1.000**
	WETACID	-1.000**	.537	1.000	-.177	-.120	-.144
	MTOE	-1.000**	.[a]	-.177	1.000	.454	-.380
	MTSP	-.616	1.000**	-.120	.454	1.000	.504
	P450	.376	1.000**	-.144	-.380	.504	1.000
Sig. (2-tailed)	TMETAL	.	.	.	.	.269	.532
	WETDI	.	.	.639	.	.	.
	WETACID	.	.639	.	.738	.759	.712
	MTOE	.	.	.738	.	.187	.278
	MTSP	.269	.	.759	.187	.	.055
	P450	.532	.	.712	.278	.055	.
Sum of Squares and Cross-products	TMETAL	303.200	.000	-27.150	-13.700	-9.012	593.600
	WETDI	.000	2.000	9.400	.000	.265	42.000
	WETACID	-27.150	9.400	2940.492	-8.454	-4.425	-921.567
	MTOE	-13.700	.000	-8.454	3.954	.509	-56.271
	MTSP	-9.012	.265	-4.425	.509	1.157	88.085
	P450	593.600	42.000	-921.567	-56.271	88.085	26403.733
Covariance	TMETAL	75.800	.	-27.150	-13.700	-2.253	148.400
	WETDI	.	1.000	4.700	.	.265	42.000
	WETACID	-27.150	4.700	226.192	-1.691	-.553	-115.196
	MTOE	-13.700	.	-1.691	.439	5.659E-02	-6.252
	MTSP	-2.253	.265	-.553	5.659E-02	8.268E-02	6.292
	P450	148.400	42.000	-115.196	-6.252	6.292	1885.981
N	TMETAL	5	1	2	2	5	5
	WETDI	1	3	3	1	2	2
	WETACID	2	3	14	6	9	9
	MTOE	2	1	6	10	10	10
	MTSP	5	2	9	10	15	15
	P450	5	2	9	10	15	15

**. Correlation is significant at the 0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

CADMIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.	-1.000	-1.000	-.447	.783
		WETDI	.	1.000	.500	.	1.000	1.000
		WETACID	-1.000	.500	1.000	-.257	-.167	.033
		MTOE	-1.000	.	-.257	1.000	.503	-.274
		MTSP	-.447	1.000	-.167	.503	1.000	.456
		P450	.783	1.000	.033	-.274	.456	1.000
	Sig. (2-tailed)	TMETAL	.	.	1.000	1.000	.450	.118
		WETDI	.	.	.667	.	1.000	1.000
		WETACID	1.000	.667	.	.623	.668	.932
		MTOE	1.000	.	.623	.	.138	.444
		MTSP	.450	1.000	.668	.138	.	.087
		P450	.118	1.000	.932	.444	.087	.
	N	TMETAL	5	1	2	2	5	5
		WETDI	1	3	3	1	2	2
		WETACID	2	3	14	6	9	9
		MTOE	2	1	6	10	10	10
		MTSP	5	2	9	10	15	15
		P450	5	2	9	10	15	15

CALCIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	7685.1923	11551.59	52
WETDI	17055.19	34773.75	52
WETACID	338215.0	477141.4	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.309*	.821**	-.241	-.134	.066
	WETDI	.309*	1.000	.011	.093	-.050	-.149
	WETACID	.821**	.011	1.000	-.438	.031	.020
	MTOE	-.241	.093	-.438	1.000	.470**	-.078
	MTSP	-.134	-.050	.031	.470**	1.000	.043
	P450	.066	-.149	.020	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.026	.000	.134	.369	.659
	WETDI	.026	.	.963	.567	.738	.317
	WETACID	.000	.963	.	.177	.912	.943
	MTOE	.134	.567	.177	.	.002	.632
	MTSP	.369	.738	.912	.002	.	.773
	P450	.659	.317	.943	.632	.773	.
Sum of Squares and Cross-products	TMETAL	6.8E+09	6.3E+09	2.6E+10	-89654.2	-69279.7	1541769
	WETDI	6.3E+09	6.2E+10	5.2E+09	105019.0	-78115.9	-1.0E+07
	WETACID	2.6E+10	5.2E+09	4.3E+12	-1358011	106297.6	8384840
	MTOE	-89654.2	105019.0	-1358011	21.188	13.539	-82.594
	MTSP	-69279.7	-78115.9	106297.6	13.539	39.824	77.618
	P450	1541769	-1.0E+07	8384840	-82.594	77.618	80874.979
Covariance	TMETAL	1.3E+08	1.2E+08	1.4E+09	-2298.827	-1506.081	33516.716
	WETDI	1.2E+08	1.2E+09	2.7E+08	2692.795	-1698.171	-227813
	WETACID	1.4E+09	2.7E+08	2.3E+11	-135801	7592.686	598917.1
	MTOE	-2298.827	2692.795	-135801	.543	.347	-2.118
	MTSP	-1506.081	-1698.171	7592.686	.347	.866	1.687
	P450	33516.716	-227813	598917.1	-2.118	1.687	1758.152
N	TMETAL	52	52	20	40	47	47
	WETDI	52	52	20	40	47	47
	WETACID	20	20	20	11	15	15
	MTOE	40	40	11	40	40	40
	MTSP	47	47	15	40	47	47
	P450	47	47	15	40	47	47

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

CALCIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.430**	.534*	-.346*	-.113	-.038
		WETDI	.430**	1.000	.208	.074	.139	-.224
		WETACID	.534*	.208	1.000	-.392	.064	.068
		MTOE	-.346*	.074	-.392	1.000	.628**	.005
		MTSP	-.113	.139	.064	.628**	1.000	.228
		P450	-.038	-.224	.068	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.001	.015	.029	.450	.800
		WETDI	.001	.	.380	.651	.351	.130
		WETACID	.015	.380	.	.233	.820	.810
		MTOE	.029	.651	.233	.	.000	.976
		MTSP	.450	.351	.820	.000	.	.123
		P450	.800	.130	.810	.976	.123	.
	N	TMETAL	52	52	20	40	47	47
		WETDI	52	52	20	40	47	47
		WETACID	20	20	20	11	15	15
		MTOE	40	40	11	40	40	40
		MTSP	47	47	15	40	47	47
		P450	47	47	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

CHROMIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	55.3400	44.6678	50
WETDI	45.1429	138.2750	14
WETACID	466.0000	205.1025	20
MTOE	.8154	.7369	38
MTSP	.7871	.9477	45
P450	53.6444	42.1265	45

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	-.115	.598**	-.067	.060	-.122
	WETDI	-.115	1.000	.109	.241	-.153	-.412
	WETACID	.598**	.109	1.000	.261	-.090	.020
	MTOE	-.067	.241	.261	1.000	.500**	-.038
	MTSP	.060	-.153	-.090	.500**	1.000	.032
	P450	-.122	-.412	.020	-.038	.032	1.000
Sig. (2-tailed)	TMETAL	.	.694	.005	.688	.693	.424
	WETDI	.694	.	.796	.533	.654	.208
	WETACID	.005	.796	.	.437	.749	.944
	MTOE	.688	.533	.437	.	.001	.820
	MTSP	.693	.654	.749	.001	.	.836
	P450	.424	.208	.944	.820	.836	.
Sum of Squares and Cross-products	TMETAL	97765.220	-5599.000	67372.000	-88.909	115.486	-10374.3
	WETDI	-5599.000	248559.7	32972.250	275.271	-87.324	-30588.8
	WETACID	67372.000	32972.250	799274.0	327.513	-127.750	3435.000
	MTOE	-88.909	275.271	327.513	20.090	13.958	-38.711
	MTSP	115.486	-87.324	-127.750	13.958	39.520	55.838
	P450	-10374.3	-30588.8	3435.000	-38.711	55.838	78084.311
Covariance	TMETAL	1995.209	-430.692	3545.895	-2.403	2.625	-235.780
	WETDI	-430.692	19119.978	4710.321	34.409	-8.732	-3058.882
	WETACID	3545.895	4710.321	42067.053	32.751	-9.125	245.357
	MTOE	-2.403	34.409	32.751	.543	.377	-1.046
	MTSP	2.625	-8.732	-9.125	.377	.898	1.269
	P450	-235.780	-3058.882	245.357	-1.046	1.269	1774.643
N	TMETAL	50	14	20	38	45	45
	WETDI	14	14	8	9	11	11
	WETACID	20	8	20	11	15	15
	MTOE	38	9	11	38	38	38
	MTSP	45	11	15	38	45	45
	P450	45	11	15	38	45	45

**. Correlation is significant at the 0.01 level (2-tailed).

CHROMIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	-.243	.715**	.077	.032	-.102
		WETDI	-.243	1.000	.048	.186	.119	-.073
		WETACID	.715**	.048	1.000	.355	-.329	-.036
		MTOE	.077	.186	.355	1.000	.647**	.050
		MTSP	.032	.119	-.329	.647**	1.000	.226
		P450	-.102	-.073	-.036	.050	.226	1.000
	Sig. (2-tailed)	TMETAL	.	.402	.000	.644	.836	.507
		WETDI	.402	.	.911	.632	.727	.831
		WETACID	.000	.911	.	.284	.231	.899
		MTOE	.644	.632	.284	.	.000	.765
		MTSP	.836	.727	.231	.000	.	.136
		P450	.507	.831	.899	.765	.136	.
	N	TMETAL	50	14	20	38	45	45
		WETDI	14	14	8	9	11	11
		WETACID	20	8	20	11	15	15
		MTOE	38	9	11	38	38	38
		MTSP	45	11	15	38	45	45
		P450	45	11	15	38	45	45

**. Correlation is significant at the .01 level (2-tailed).

COBALT

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	14.3846	4.8351	52
WETDI	10.4595	35.8977	37
WETACID	345.8350	220.3724	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.113	.043	-.227	-.096	.080
	WETDI	.113	1.000	-.058	.174	-.061	-.140
	WETACID	.043	-.058	1.000	-.404	-.298	.285
	MTOE	-.227	.174	-.404	1.000	.470**	-.078
	MTSP	-.096	-.061	-.298	.470**	1.000	.043
	P450	.080	-.140	.285	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.507	.858	.160	.521	.592
	WETDI	.507	.	.825	.396	.739	.445
	WETACID	.858	.825	.	.217	.281	.304
	MTOE	.160	.396	.217	.	.002	.632
	MTSP	.521	.739	.281	.002	.	.773
	P450	.592	.445	.304	.632	.773	.
Sum of Squares and Cross-products	TMETAL	1192.308	720.162	865.900	-27.856	-18.199	685.234
	WETDI	720.162	46391.189	-10342.5	142.901	-74.590	-7013.438
	WETACID	865.900	-10342.5	922715.7	-616.064	-449.697	52233.360
	MTOE	-27.856	142.901	-616.064	21.188	13.539	-82.594
	MTSP	-18.199	-74.590	-449.697	13.539	39.824	77.618
	P450	685.234	-7013.438	52233.360	-82.594	77.618	80874.979
Covariance	TMETAL	23.379	20.005	45.574	-.714	-.396	14.896
	WETDI	20.005	1288.644	-646.408	5.716	-2.406	-226.240
	WETACID	45.574	-646.408	48563.987	-61.606	-32.121	3730.954
	MTOE	-.714	5.716	-61.606	.543	.347	-2.118
	MTSP	-.396	-2.406	-32.121	.347	.866	1.687
	P450	14.896	-226.240	3730.954	-2.118	1.687	1758.152
N	TMETAL	52	37	20	40	47	47
	WETDI	37	37	17	26	32	32
	WETACID	20	17	20	11	15	15
	MTOE	40	26	11	40	40	40
	MTSP	47	32	15	40	47	47
	P450	47	32	15	40	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

COBALT

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.257	-.028	-.294	-.149	.014
		WETDI	.257	1.000	.189	.051	-.137	.001
		WETACID	-.028	.189	1.000	-.369	-.361	.268
		MTOE	-.294	.051	-.369	1.000	.628**	.005
		MTSP	-.149	-.137	-.361	.628**	1.000	.228
		P450	.014	.001	.268	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.124	.907	.066	.317	.926
		WETDI	.124	.	.468	.806	.455	.998
		WETACID	.907	.468	.	.264	.187	.334
		MTOE	.066	.806	.264	.	.000	.976
		MTSP	.317	.455	.187	.000	.	.123
		P450	.926	.998	.334	.976	.123	.
	N	TMETAL	52	37	20	40	47	47
		WETDI	37	37	17	26	32	32
		WETACID	20	17	20	11	15	15
		MTOE	40	26	11	40	40	40
		MTSP	47	32	15	40	47	47
		P450	47	32	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

COPPER

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	54.1731	45.3802	52
WETDI	80.1042	332.2159	48
WETACID	906.9450	664.9778	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.095	.048	-.277	-.139	-.036
	WETDI	.095	1.000	.560*	.107	-.100	-.145
	WETACID	.048	.560*	1.000	.351	-.370	-.224
	MTOE	-.277	.107	.351	1.000	.470**	-.078
	MTSP	-.139	-.100	-.370	.470**	1.000	.043
	P450	-.036	-.145	-.224	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.522	.841	.083	.351	.809
	WETDI	.522	.	.010	.534	.524	.352
	WETACID	.841	.010	.	.290	.175	.422
	MTOE	.083	.534	.290	.	.002	.632
	MTSP	.351	.524	.175	.002	.	.773
	P450	.809	.352	.422	.632	.773	.
Sum of Squares and Cross-products	TMETAL	105027.4	68516.500	12842.925	-404.761	-281.744	-3312.234
	WETDI	68516.500	5187268	3615896	1060.112	-1413.084	-91219.6
	WETACID	12842.925	3615896	8401715	1182.093	-1487.758	-109625
	MTOE	-404.761	1060.112	1182.093	21.188	13.539	-82.594
	MTSP	-281.744	-1413.084	-1487.758	13.539	39.824	77.618
	P450	-3312.234	-91219.6	-109625	-82.594	77.618	80874.979
Covariance	TMETAL	2059.362	1457.798	675.943	-10.378	-6.125	-72.005
	WETDI	1457.798	110367.4	190310.3	30.289	-33.645	-2171.895
	WETACID	675.943	190310.3	442195.5	118.209	-106.268	-7830.371
	MTOE	-10.378	30.289	118.209	.543	.347	-2.118
	MTSP	-6.125	-33.645	-106.268	.347	.866	1.687
	P450	-72.005	-2171.895	-7830.371	-2.118	1.687	1758.152
N	TMETAL	52	48	20	40	47	47
	WETDI	48	48	20	36	43	43
	WETACID	20	20	20	11	15	15
	MTOE	40	36	11	40	40	40
	MTSP	47	43	15	40	47	47
	P450	47	43	15	40	47	47

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

COPPER

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.390**	.006	-.259	-.256	-.028
		WETDI	.390**	1.000	.090	-.251	-.336*	-.086
		WETACID	.006	.090	1.000	.341	-.603*	-.246
		MTOE	-.259	-.251	.341	1.000	.628**	.005
		MTSP	-.256	-.336*	-.603*	.628**	1.000	.228
		P450	-.028	-.086	-.246	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.006	.981	.107	.083	.851
		WETDI	.006	.	.707	.140	.028	.585
		WETACID	.981	.707	.	.305	.017	.376
		MTOE	.107	.140	.305	.	.000	.976
		MTSP	.083	.028	.017	.000	.	.123
		P450	.851	.585	.376	.976	.123	.
	N	TMETAL	52	48	20	40	47	47
		WETDI	48	48	20	36	43	43
		WETACID	20	20	20	11	15	15
		MTOE	40	36	11	40	40	40
		MTSP	47	43	15	40	47	47
		P450	47	43	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

IRON

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	29313.46	18030.90	52
WETDI	18871.68	111835.3	47
WETACID	431750.0	213139.9	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.059	.712**	-.156	.042	-.125
	WETDI	.059	1.000	.448	.147	-.083	-.165
	WETACID	.712**	.448	1.000	.376	-.074	-.100
	MTOE	-.156	.147	.376	1.000	.470**	-.078
	MTSP	.042	-.083	-.074	.470**	1.000	.043
	P450	-.125	-.165	-.100	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.694	.000	.337	.780	.403
	WETDI	.694	.	.054	.401	.603	.296
	WETACID	.000	.054	.	.254	.793	.722
	MTOE	.337	.401	.254	.	.002	.632
	MTSP	.780	.603	.793	.002	.	.773
	P450	.403	.296	.722	.632	.773	.
Sum of Squares and Cross-products	TMETAL	1.7E+10	5.7E+09	3.5E+10	-85713.5	32550.051	-4373309
	WETDI	5.7E+09	5.8E+11	3.1E+11	486924.0	-390982	-3.4E+07
	WETACID	3.5E+10	3.1E+11	8.6E+11	463275.9	-107434	-1.8E+07
	MTOE	-85713.5	486924.0	463275.9	21.188	13.539	-82.594
	MTSP	32550.051	-390982	-107434	13.539	39.824	77.618
	P450	-4373309	-3.4E+07	-1.8E+07	-82.594	77.618	80874.979
Covariance	TMETAL	3.3E+08	1.2E+08	1.8E+09	-2197.783	707.610	-95071.9
	WETDI	1.2E+08	1.3E+10	1.7E+10	14321.294	-9536.150	-832024
	WETACID	1.8E+09	1.7E+10	4.5E+10	46327.591	-7673.857	-1267257
	MTOE	-2197.783	14321.294	46327.591	.543	.347	-2.118
	MTSP	707.610	-9536.150	-7673.857	.347	.866	1.687
	P450	-95071.9	-832024	-1267257	-2.118	1.687	1758.152
N	TMETAL	52	47	20	40	47	47
	WETDI	47	47	19	35	42	42
	WETACID	20	19	20	11	15	15
	MTOE	40	35	11	40	40	40
	MTSP	47	42	15	40	47	47
	P450	47	42	15	40	47	47

** Correlation is significant at the 0.01 level (2-tailed).

COPPER

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.144	.795**	-.173	-.024	-.105
		WETDI	.144	1.000	.234	-.163	-.317*	-.051
		WETACID	.795**	.234	1.000	.542	-.497	-.267
		MTOE	-.173	-.163	.542	1.000	.628**	.005
		MTSP	-.024	-.317*	-.497	.628**	1.000	.228
		P450	-.105	-.051	-.267	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.334	.000	.285	.871	.482
		WETDI	.334	.	.334	.350	.041	.750
		WETACID	.000	.334	.	.085	.060	.337
		MTOE	.285	.350	.085	.	.000	.976
		MTSP	.871	.041	.060	.000	.	.123
		P450	.482	.750	.337	.976	.123	.
	N	TMETAL	52	47	20	40	47	47
		WETDI	47	47	19	35	42	42
		WETACID	20	19	20	11	15	15
		MTOE	40	35	11	40	40	40
		MTSP	47	42	15	40	47	47
		P450	47	42	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

LEAD

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	78.0577	93.2928	52
WETDI	126.5556	601.1870	36
WETACID	2203.7000	2452.1871	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	-.019	.908**	-.198	-.171	-.064
	WETDI	-.019	1.000	.149	.194	-.114	-.201
	WETACID	.908**	.149	1.000	.610*	.086	-.283
	MTOE	-.198	.194	.610*	1.000	.470**	-.078
	MTSP	-.171	-.114	.086	.470**	1.000	.043
	P450	-.064	-.201	-.283	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.911	.000	.220	.249	.669
	WETDI	.911	.	.555	.352	.542	.278
	WETACID	.000	.555	.	.046	.761	.307
	MTOE	.220	.352	.046	.	.002	.632
	MTSP	.249	.542	.761	.002	.	.773
	P450	.669	.278	.307	.632	.773	.
Sum of Squares and Cross-products	TMETAL	443880.8	-42805.3	4584546	-421.693	-716.601	-12068.7
	WETDI	-42805.3	1.3E+07	5529122	2429.322	-746.297	-162567
	WETACID	4584546	5529122	1.1E+08	5067.616	1503.874	-602720
	MTOE	-421.693	2429.322	5067.616	21.188	13.539	-82.594
	MTSP	-716.601	-746.297	1503.874	13.539	39.824	77.618
	P450	-12068.7	-162567	-602720	-82.594	77.618	80874.979
Covariance	TMETAL	8703.546	-1223.010	241291.9	-10.813	-15.578	-262.364
	WETDI	-1223.010	361425.8	325242.5	101.222	-24.877	-5418.895
	WETACID	241291.9	325242.5	6013221	506.762	107.420	-43051.5
	MTOE	-10.813	101.222	506.762	.543	.347	-2.118
	MTSP	-15.578	-24.877	107.420	.347	.866	1.687
	P450	-262.364	-5418.895	-43051.5	-2.118	1.687	1758.152
N	TMETAL	52	36	20	40	47	47
	WETDI	36	36	18	25	31	31
	WETACID	20	18	20	11	15	15
	MTOE	40	25	11	40	40	40
	MTSP	47	31	15	40	47	47
	P450	47	31	15	40	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

LEAD

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.525**	.802**	-.094	-.259	-.074
		WETDI	.525**	1.000	.459	-.100	-.036	-.127
		WETACID	.802**	.459	1.000	.633*	-.196	-.511
		MTOE	-.094	-.100	.633*	1.000	.628**	.005
		MTSP	-.259	-.036	-.196	.628**	1.000	.228
		P450	-.074	-.127	-.511	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.001	.000	.563	.079	.620
		WETDI	.001	.	.055	.635	.846	.496
		WETACID	.000	.055	.	.036	.483	.051
		MTOE	.563	.635	.036	.	.000	.976
		MTSP	.079	.846	.483	.000	.	.123
		P450	.620	.496	.051	.976	.123	.
	N	TMETAL	52	36	20	40	47	47
		WETDI	36	36	18	25	31	31
		WETACID	20	18	20	11	15	15
		MTOE	40	25	11	40	40	40
		MTSP	47	31	15	40	47	47
		P450	47	31	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

MAGNESIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	9627.8846	2902.3515	52
WETDI	17542.50	26521.54	52
WETACID	228950.0	95322.43	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.262	.178	-.074	.015	-.170
	WETDI	.262	1.000	.200	.086	.017	-.170
	WETACID	.178	.200	1.000	-.483	-.210	-.016
	MTOE	-.074	.086	-.483	1.000	.470**	-.078
	MTSP	.015	.017	-.210	.470**	1.000	.043
	P450	-.170	-.170	-.016	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.061	.452	.648	.921	.253
	WETDI	.061	.	.399	.598	.909	.252
	WETACID	.452	.399	.	.132	.452	.955
	MTOE	.648	.598	.132	.	.002	.632
	MTSP	.921	.909	.452	.002	.	.773
	P450	.253	.252	.955	.632	.773	.
Sum of Squares and Cross-products	TMETAL	4.3E+08	1.0E+09	1.0E+09	-5604.062	1820.692	-938899
	WETDI	1.0E+09	3.6E+10	1.4E+10	72889.996	20416.539	-9114113
	WETACID	1.0E+09	1.4E+10	1.7E+11	-320673	-140562	-1308800
	MTOE	-5604.062	72889.996	-320673	21.188	13.539	-82.594
	MTSP	1820.692	20416.539	-140562	13.539	39.824	77.618
	P450	-938899	-9114113	-1308800	-82.594	77.618	80874.979
Covariance	TMETAL	8423644	2.0E+07	5.3E+07	-143.694	39.580	-20410.8
	WETDI	2.0E+07	7.0E+08	7.5E+08	1868.974	443.838	-198133
	WETACID	5.3E+07	7.5E+08	9.1E+09	-32067.3	-10040.1	-93485.7
	MTOE	-143.694	1868.974	-32067.3	.543	.347	-2.118
	MTSP	39.580	443.838	-10040.1	.347	.866	1.687
	P450	-20410.8	-198133	-93485.7	-2.118	1.687	1758.152
N	TMETAL	52	52	20	40	47	47
	WETDI	52	52	20	40	47	47
	WETACID	20	20	20	11	15	15
	MTOE	40	40	11	40	40	40
	MTSP	47	47	15	40	47	47
	P450	47	47	15	40	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

MAGNESIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.335*	.303	-.062	.001	-.159
		WETDI	.335*	1.000	.074	.073	.000	-.336*
		WETACID	.303	.074	1.000	-.478	-.246	-.041
		MTOE	-.062	.073	-.478	1.000	.628**	.005
		MTSP	.001	.000	-.246	.628**	1.000	.228
		P450	-.159	-.336*	-.041	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.015	.194	.706	.997	.285
		WETDI	.015	.	.755	.656	.998	.021
		WETACID	.194	.755	.	.137	.376	.884
		MTOE	.706	.656	.137	.	.000	.976
		MTSP	.997	.998	.376	.000	.	.123
		P450	.285	.021	.884	.976	.123	.
	N	TMETAL	52	52	20	40	47	47
		WETDI	52	52	20	40	47	47
		WETACID	20	20	20	11	15	15
		MTOE	40	40	11	40	40	40
		MTSP	47	47	15	40	47	47
		P450	47	47	15	40	47	47

*. Correlation is significant at the .05 level (2-tailed).

**. Correlation is significant at the .01 level (2-tailed).

MANGANESE

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	467.3654	335.6163	52
WETDI	334.3878	825.6885	49
WETACID	16002.00	15114.81	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.283*	.808**	-.165	-.132	-.002
	WETDI	.283*	1.000	-.040	-.079	-.114	.034
	WETACID	.808**	-.040	1.000	-.575	-.327	.090
	MTOE	-.165	-.079	-.575	1.000	.470**	-.078
	MTSP	-.132	-.114	-.327	.470**	1.000	.043
	P450	-.002	.034	.090	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.049	.000	.310	.375	.990
	WETDI	.049	.	.870	.641	.460	.828
	WETACID	.000	.870	.	.064	.234	.751
	MTOE	.310	.641	.064	.	.002	.632
	MTSP	.375	.460	.234	.002	.	.773
	P450	.990	.828	.751	.632	.773	.
Sum of Squares and Cross-products	TMETAL	5744552	3591113	4.9E+07	-1724.646	-1983.884	-1290.000
	WETDI	3591113	3.3E+07	-8549690	-2014.065	-4100.105	53041.568
	WETACID	4.9E+07	-8549690	4.3E+09	-59314.3	-33585.1	1118502
	MTOE	-1724.646	-2014.065	-59314.3	21.188	13.539	-82.594
	MTSP	-1983.884	-4100.105	-33585.1	13.539	39.824	77.618
	P450	-1290.000	53041.568	1118502	-82.594	77.618	80874.979
Covariance	TMETAL	112638.3	74814.861	2586945	-44.222	-43.128	-28.043
	WETDI	74814.861	681761.5	-474983	-55.946	-95.351	1233.525
	WETACID	2586945	-474983	2.3E+08	-5931.425	-2398.937	79893.000
	MTOE	-44.222	-55.946	-5931.425	.543	.347	-2.118
	MTSP	-43.128	-95.351	-2398.937	.347	.866	1.687
	P450	-28.043	1233.525	79893.000	-2.118	1.687	1758.152
N	TMETAL	52	49	20	40	47	47
	WETDI	49	49	19	37	44	44
	WETACID	20	19	20	11	15	15
	MTOE	40	37	11	40	40	40
	MTSP	47	44	15	40	47	47
	P450	47	44	15	40	47	47

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

MANGANESE

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.180	.824**	-.130	-.046	.074
		WETDI	.180	1.000	-.030	-.120	-.169	-.217
		WETACID	.824**	-.030	1.000	-.510	-.232	.000
		MTOE	-.130	-.120	-.510	1.000	.628**	.005
		MTSP	-.046	-.169	-.232	.628**	1.000	.228
		P450	.074	-.217	.000	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.215	.000	.425	.759	.620
		WETDI	.215	.	.903	.479	.273	.157
		WETACID	.000	.903	.	.109	.405	1.000
		MTOE	.425	.479	.109	.	.000	.976
		MTSP	.759	.273	.405	.000	.	.123
		P450	.620	.157	1.000	.976	.123	.
	N	TMETAL	52	49	20	40	47	47
		WETDI	49	49	19	37	44	44
		WETACID	20	19	20	11	15	15
		MTOE	40	37	11	40	40	40
		MTSP	47	44	15	40	47	47
		P450	47	44	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

MERCURY

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	1.5556	1.7401	9
WETDI	1.0000	.0000	3
WETACID	.9243	.9160	14
MTOE	.9097	.7293	32
MTSP	.7541	.9319	39
P450	51.9231	42.4080	39

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.[a]	.[a]	-.620	.406	-.137
	WETDI	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	WETACID	.[a]	.[a]	1.000	.126	.241	.484
	MTOE	-.620	.[a]	.126	1.000	.396*	-.012
	MTSP	.406	.[a]	.241	.396*	1.000	.053
	P450	-.137	.[a]	.484	-.012	.053	1.000
Sig. (2-tailed)	TMETAL	.	.	.	.264	.425	.796
	WETDI	.	.	.	.	.	.
	WETACID	.	.	.	.728	.406	.079
	MTOE	.264	.	.728	.	.025	.946
	MTSP	.425	.	.406	.025	.	.750
	P450	.796	.	.079	.946	.750	.
Sum of Squares and Cross-products	TMETAL	24.222	.000	.	-.946	2.617	-54.667
	WETDI	.000	.000	.000	.000	.000	.000
	WETACID	.	.000	10.907	.293	1.355	326.543
	MTOE	-.946	.000	.293	16.489	9.114	-10.097
	MTSP	2.617	.000	1.355	9.114	33.000	79.125
	P450	-54.667	.000	326.543	-10.097	79.125	68340.769
Covariance	TMETAL	3.028	.	.	-.236	.523	-10.933
	WETDI	.	.000	.	.000	.000	.000
	WETACID	.	.	.839	3.258E-02	.104	25.119
	MTOE	-.236	.000	3.258E-02	.532	.294	-.326
	MTSP	.523	.000	.104	.294	.868	2.082
	P450	-10.933	.000	25.119	-.326	2.082	1798.441
N	TMETAL	9	1	0	5	6	6
	WETDI	1	3	1	2	3	3
	WETACID	0	1	14	10	14	14
	MTOE	5	2	10	32	32	32
	MTSP	6	3	14	32	39	39
	P450	6	3	14	32	39	39

*. Correlation is significant at the 0.05 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

MERCURY

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.	.	-.707	.169	.169
		WETDI	.	.	.	.	.	.
		WETACID	.	.	1.000	-.067	.288	.461
		MTOE	-.707	.	-.067	1.000	.597**	-.055
		MTSP	.169	.	.288	.597**	1.000	.229
		P450	.169	.	.461	-.055	.229	1.000
	Sig. (2-tailed)	TMETAL	.	.	.	.182	.749	.749
		WETDI	.	.	.	.	.	.
		WETACID	.	.	.	.854	.318	.097
		MTOE	.182	.	.854	.	.000	.764
		MTSP	.749	.	.318	.000	.	.161
		P450	.749	.	.097	.764	.161	.
	N	TMETAL	9	1	0	5	6	6
		WETDI	1	3	1	2	3	3
		WETACID	0	1	14	10	14	14
		MTOE	5	2	10	32	32	32
		MTSP	6	3	14	32	39	39
		P450	6	3	14	32	39	39

**. Correlation is significant at the .01 level (2-tailed).

MOLYBDENUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	6.0000	15.1357	12
WETDI	6.8333	4.8960	24
WETACID	.	.	0
MTOE	.7696	.7278	21
MTSP	.5734	.3595	25
P450	57.5600	42.5510	25

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.291	.[a]	-.274	.538	-.113
	WETDI	.291	1.000	.[a]	-.248	-.031	-.041
	WETACID	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	MTOE	-.274	-.248	.[a]	1.000	.619**	-.072
	MTSP	.538	-.031	.[a]	.619**	1.000	.314
	P450	-.113	-.041	.[a]	-.072	.314	1.000
Sig. (2-tailed)	TMETAL	.	.575	.	.475	.135	.772
	WETDI	.575	.	.	.355	.898	.863
	WETACID	.	.	.	.	.	.
	MTOE	.475	.355	.	.	.003	.758
	MTSP	.135	.898	.	.003	.	.126
	P450	.772	.863	.	.758	.126	.
Sum of Squares and Cross-products	TMETAL	2520.000	109.000	.	-28.332	30.232	-405.333
	WETDI	109.000	551.333	.	-10.457	-1.046	-174.800
	WETACID	.	.	.	.	.	.
	MTOE	-28.332	-10.457	.	10.595	3.164	-32.928
	MTSP	30.232	-1.046	.	3.164	3.102	115.362
	P450	-405.333	-174.800	.	-32.928	115.362	43454.160
Covariance	TMETAL	229.091	21.800	.	-3.541	3.779	-50.667
	WETDI	21.800	23.971	.	-.697	-5.51E-02	-9.200
	WETACID	.	.	.	.	.	.
	MTOE	-3.541	-.697	.	.530	.158	-1.646
	MTSP	3.779	-5.51E-02	.	.158	.129	4.807
	P450	-50.667	-9.200	.	-1.646	4.807	1810.590
N	TMETAL	12	6	0	9	9	9
	WETDI	6	24	0	16	20	20
	WETACID	0	0	0	0	0	0
	MTOE	9	16	0	21	21	21
	MTSP	9	20	0	21	25	25
	P450	9	20	0	21	25	25

**. Correlation is significant at the 0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

MOLYBDENUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.493	.	-.046	.523	-.092
		WETDI	.493	1.000	.	-.235	-.097	-.137
		WETACID	.	.	.	.	.	.
		MTOE	-.046	-.235	.	1.000	.633**	-.084
		MTSP	.523	-.097	.	.633**	1.000	.235
		P450	-.092	-.137	.	-.084	.235	1.000
	Sig. (2-tailed)	TMETAL	.	.321	.	.907	.149	.814
		WETDI	.321	.	.	.382	.684	.564
		WETACID	.	.	.	.	.	.
		MTOE	.907	.382	.	.	.002	.719
		MTSP	.149	.684	.	.002	.	.259
		P450	.814	.564	.	.719	.259	.
	N	TMETAL	12	6	0	9	9	9
		WETDI	6	24	0	16	20	20
		WETACID	0	0	0	0	0	0
		MTOE	9	16	0	21	21	21
		MTSP	9	20	0	21	25	25
		P450	9	20	0	21	25	25

**. Correlation is significant at the .01 level (2-tailed).

NICKEL

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	62.9038	26.7312	52
WETDI	33.1795	92.1737	39
WETACID	1214.2500	605.9453	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	-.117	.486*	-.160	-.120	-.141
	WETDI	-.117	1.000	-.117	.079	-.080	-.117
	WETACID	.486*	-.117	1.000	-.251	-.292	.051
	MTOE	-.160	.079	-.251	1.000	.470**	-.078
	MTSP	-.120	-.080	-.292	.470**	1.000	.043
	P450	-.141	-.117	.051	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.477	.030	.325	.421	.344
	WETDI	.477	.	.654	.666	.653	.509
	WETACID	.030	.654	.	.456	.291	.858
	MTOE	.325	.666	.456	.	.002	.632
	MTSP	.421	.653	.291	.002	.	.773
	P450	.344	.509	.858	.632	.773	.
Sum of Squares and Cross-products	TMETAL	36442.519	-11519.5	136463.5	-119.288	-137.467	-7273.617
	WETDI	-11519.5	322847.7	-161432	185.437	-277.483	-16604.7
	WETACID	136463.5	-161432	6976224	-1056.176	-1273.108	26888.800
	MTOE	-119.288	185.437	-1056.176	21.188	13.539	-82.594
	MTSP	-137.467	-277.483	-1273.108	13.539	39.824	77.618
	P450	-7273.617	-16604.7	26888.800	-82.594	77.618	80874.979
Covariance	TMETAL	714.559	-303.144	7182.289	-3.059	-2.988	-158.122
	WETDI	-303.144	8495.993	-10089.5	5.982	-8.409	-503.173
	WETACID	7182.289	-10089.5	367169.7	-105.618	-90.936	1920.629
	MTOE	-3.059	5.982	-105.618	.543	.347	-2.118
	MTSP	-2.988	-8.409	-90.936	.347	.866	1.687
	P450	-158.122	-503.173	1920.629	-2.118	1.687	1758.152
N	TMETAL	52	39	20	40	47	47
	WETDI	39	39	17	32	34	34
	WETACID	20	17	20	11	15	15
	MTOE	40	32	11	40	40	40
	MTSP	47	34	15	40	47	47
	P450	47	34	15	40	47	47

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

NICKEL

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.193	.456*	-.321*	-.197	-.141
		WETDI	.193	1.000	.086	-.151	-.066	-.081
		WETACID	.456*	.086	1.000	-.323	-.375	-.007
		MTOE	-.321*	-.151	-.323	1.000	.628**	.005
		MTSP	-.197	-.066	-.375	.628**	1.000	.228
		P450	-.141	-.081	-.007	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.239	.043	.044	.185	.345
		WETDI	.239	.	.743	.410	.711	.651
		WETACID	.043	.743	.	.332	.168	.980
		MTOE	.044	.410	.332	.	.000	.976
		MTSP	.185	.711	.168	.000	.	.123
		P450	.345	.651	.980	.976	.123	.
	N	TMETAL	52	39	20	40	47	47
		WETDI	39	39	17	32	34	34
		WETACID	20	17	20	11	15	15
		MTOE	40	32	11	40	40	40
		MTSP	47	34	15	40	47	47
		P450	47	34	15	40	47	47

*. Correlation is significant at the .05 level (2-tailed).

**. Correlation is significant at the .01 level (2-tailed).

POTASSIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	3378.3077	1429.7017	52
WETDI	15084.25	11802.77	52
WETACID	57700.00	16484.73	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.331*	.448*	-.087	-.096	-.095
	WETDI	.331*	1.000	.365	.142	.008	-.295*
	WETACID	.448*	.365	1.000	-.310	-.226	-.455
	MTOE	-.087	.142	-.310	1.000	.470**	-.078
	MTSP	-.096	.008	-.226	.470**	1.000	.043
	P450	-.095	-.295*	-.455	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.016	.047	.593	.522	.526
	WETDI	.016	.	.114	.382	.957	.044
	WETACID	.047	.114	.	.353	.418	.089
	MTOE	.593	.382	.353	.	.002	.632
	MTSP	.522	.957	.418	.002	.	.773
	P450	.526	.044	.089	.632	.773	.
Sum of Squares and Cross-products	TMETAL	1.0E+08	2.9E+08	2.2E+08	-3537.626	-6015.666	-269017
	WETDI	2.9E+08	7.1E+09	1.5E+09	50576.455	4236.140	-6908940
	WETACID	2.2E+08	1.5E+09	5.2E+09	-25521.0	-26858.6	-6572740
	MTOE	-3537.626	50576.455	-25521.0	21.188	13.539	-82.594
	MTSP	-6015.666	4236.140	-26858.6	13.539	39.824	77.618
	P450	-269017	-6908940	-6572740	-82.594	77.618	80874.979
Covariance	TMETAL	2044047	5590774	1.2E+07	-90.708	-130.775	-5848.202
	WETDI	5590774	1.4E+08	7.7E+07	1296.832	92.090	-150194
	WETACID	1.2E+07	7.7E+07	2.7E+08	-2552.105	-1918.471	-469481
	MTOE	-90.708	1296.832	-2552.105	.543	.347	-2.118
	MTSP	-130.775	92.090	-1918.471	.347	.866	1.687
	P450	-5848.202	-150194	-469481	-2.118	1.687	1758.152
N	TMETAL	52	52	20	40	47	47
	WETDI	52	52	20	40	47	47
	WETACID	20	20	20	11	15	15
	MTOE	40	40	11	40	40	40
	MTSP	47	47	15	40	47	47
	P450	47	47	15	40	47	47

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

POTASSIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.412**	.505*	-.173	-.140	.003
		WETDI	.412**	1.000	.543*	.032	-.052	-.390**
		WETACID	.505*	.543*	1.000	-.287	-.336	-.291
		MTOE	-.173	.032	-.287	1.000	.628**	.005
		MTSP	-.140	-.052	-.336	.628**	1.000	.228
		P450	.003	-.390**	-.291	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.002	.023	.285	.347	.984
		WETDI	.002	.	.013	.845	.728	.007
		WETACID	.023	.013	.	.392	.221	.292
		MTOE	.285	.845	.392	.	.000	.976
		MTSP	.347	.728	.221	.000	.	.123
		P450	.984	.007	.292	.976	.123	.
	N	TMETAL	52	52	20	40	47	47
		WETDI	52	52	20	40	47	47
		WETACID	20	20	20	11	15	15
		MTOE	40	40	11	40	40	40
		MTSP	47	47	15	40	47	47
		P450	47	47	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

SELENIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	1.0000	.	1
WETDI	4.0000	.0000	3
WETACID	.	.	0
MTOE	4.700E-02	2.646E-03	3
MTSP	.2600	.1562	3
P450	37.3333	35.4448	3

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	. [a]	. [a]	. [a]	. [a]	. [a]	. [a]
	WETDI	. [a]	. [a]	. [a]	. [a]	. [a]	. [a]
	WETACID	. [a]	. [a]	. [a]	. [a]	. [a]	. [a]
	MTOE	. [a]	. [a]	. [a]	1.000	-.992	.954
	MTSP	. [a]	. [a]	. [a]	-.992	1.000	-.984
	P450	. [a]	. [a]	. [a]	.954	-.984	1.000
Sig. (2-tailed)	TMETAL	.	.	.	.	.	.
	WETDI	.	.	.	.	.	.
	WETACID	.	.	.	.	.	.
	MTOE	.	.	.	.	.080	.193
	MTSP	.	.	.	.080	.	.113
	P450	.	.	.	.193	.113	.
Sum of Squares and Cross-products	TMETAL	.000	.	.	.	.	.
	WETDI	.	.000	.	.000	.000	.000
	WETACID	.	.	.	.	.	.
	MTOE	.	.000	.	1.400E-05	-8.20E-04	.179
	MTSP	.	.000	.	-8.20E-04	4.880E-02	-10.900
	P450	.	.000	.	.179	-10.900	2512.667
Covariance	TMETAL	.	.	.	.	.	.
	WETDI	.	.000	.	.000	.000	.000
	WETACID	.	.	.	.	.	.
	MTOE	.	.000	.	7.000E-06	-4.10E-04	8.950E-02
	MTSP	.	.000	.	-4.10E-04	2.440E-02	-5.450
	P450	.	.000	.	8.950E-02	-5.450	1256.333
N	TMETAL	1	0	0	0	0	0
	WETDI	0	3	0	3	3	3
	WETACID	0	0	0	0	0	0
	MTOE	0	3	0	3	3	3
	MTSP	0	3	0	3	3	3
	P450	0	3	0	3	3	3

a. Cannot be computed because at least one of the variables is constant.

SELENIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	.	.	.	.	.	.
		WETDI	.	.	.	.	.	.
		WETACID	.	.	.	.	.	.
		MTOE	.	.	.	1.000	-1.000**	.500
		MTSP	.	.	.	-1.000**	1.000	-.500
		P450	.	.	.	.500	-.500	1.000
	Sig. (2-tailed)	TMETAL	.	.	.	.	.	.
		WETDI	.	.	.	.	.	.
		WETACID	.	.	.	.	.	.
		MTOE	.	.	.	.	.000	.667
		MTSP	.	.	.	.000	.	.667
		P450	.	.	.	.667	.667	.
	N	TMETAL	1	0	0	0	0	0
		WETDI	0	3	0	3	3	3
		WETACID	0	0	0	0	0	0
		MTOE	0	3	0	3	3	3
		MTSP	0	3	0	3	3	3
		P450	0	3	0	3	3	3

** Correlation is significant at the .01 level (2-tailed).

SILVER

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	.6667	.5774	3
WETDI	1.6250	.7440	8
WETACID	1.2500	.8813	4
MTOE	.5510	.6299	11
MTSP	.4750	.2835	13
P450	30.4615	23.1755	13

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	-1.000**	.[a]	.428	-.922	-.999*
	WETDI	-1.000**	1.000	1.000**	.629	.237	.509
	WETACID	.[a]	1.000**	1.000	.970	-.105	.117
	MTOE	.428	.629	.970	1.000	-.010	-.242
	MTSP	-.922	.237	-.105	-.010	1.000	.537
	P450	-.999*	.509	.117	-.242	.537	1.000
Sig. (2-tailed)	TMETAL	.	.	.	.719	.254	.027
	WETDI	.	.	.	.130	.571	.198
	WETACID	.	.	.	.156	.895	.883
	MTOE	.719	.130	.156	.	.977	.473
	MTSP	.254	.571	.895	.977	.	.059
	P450	.027	.198	.883	.473	.059	.
Sum of Squares and Cross-products	TMETAL	.667	-.500	.	.423	-.123	-41.000
	WETDI	-.500	3.875	.850	1.011	.232	63.875
	WETACID	.	.850	2.330	1.501	-9.50E-02	8.600
	MTOE	.423	1.011	1.501	3.968	-1.33E-02	-32.000
	MTSP	-.123	.232	-9.50E-02	-1.33E-02	.964	42.305
	P450	-41.000	63.875	8.600	-32.000	42.305	6445.231
Covariance	TMETAL	.333	-.500	.	.212	-6.17E-02	-20.500
	WETDI	-.500	.554	.850	.168	3.321E-02	9.125
	WETACID	.	.850	.777	.750	-3.17E-02	2.867
	MTOE	.212	.168	.750	.397	-1.33E-03	-3.200
	MTSP	-6.17E-02	3.321E-02	-3.17E-02	-1.33E-03	8.037E-02	3.525
	P450	-20.500	9.125	2.867	-3.200	3.525	537.103
N	TMETAL	3	2	0	3	3	3
	WETDI	2	8	2	7	8	8
	WETACID	0	2	4	3	4	4
	MTOE	3	7	3	11	11	11
	MTSP	3	8	4	11	13	13
	P450	3	8	4	11	13	13

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

SILVER

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	-1.000	.	.000	-.866	-.866
		WETDI	-1.000	1.000	1.000	.722	.315	.496
		WETACID	.	1.000	1.000	.500	-.600	.400
		MTOE	.000	.722	.500	1.000	.055	-.132
		MTSP	-.866	.315	-.600	.055	1.000	.507
		P450	-.866	.496	.400	-.132	.507	1.000
	Sig. (2-tailed)	TMETAL	.	1.000	.	1.000	.333	.333
		WETDI	1.000	.	1.000	.067	.447	.212
		WETACID	.	1.000	.	.667	.400	.600
		MTOE	1.000	.067	.667	.	.873	.699
		MTSP	.333	.447	.400	.873	.	.077
		P450	.333	.212	.600	.699	.077	.
	N	TMETAL	3	2	0	3	3	3
		WETDI	2	8	2	7	8	8
		WETACID	0	2	4	3	4	4
		MTOE	3	7	3	11	11	11
		MTSP	3	8	4	11	13	13
		P450	3	8	4	11	13	13

SODIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	5130.7647	3504.1274	51
WETDI	192649.2	162578.4	52
WETACID	265015.0	257063.1	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.840**	.903**	.095	.007	-.234
	WETDI	.840**	1.000	.957**	.181	.173	-.178
	WETACID	.903**	.957**	1.000	-.285	.146	-.045
	MTOE	.095	.181	-.285	1.000	.470**	-.078
	MTSP	.007	.173	.146	.470**	1.000	.043
	P450	-.234	-.178	-.045	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.000	.000	.564	.965	.118
	WETDI	.000	.	.000	.264	.244	.232
	WETACID	.000	.000	.	.395	.603	.874
	MTOE	.564	.264	.395	.	.002	.632
	MTSP	.965	.244	.603	.002	.	.773
	P450	.118	.232	.874	.632	.773	.
Sum of Squares and Cross-products	TMETAL	6.1E+08	2.4E+10	1.8E+10	9843.248	957.751	-1620757
	WETDI	2.4E+10	1.3E+12	9.6E+11	916862.1	1241208	-5.7E+07
	WETACID	1.8E+10	9.6E+11	1.3E+12	-541598	264478.2	-9830620
	MTOE	9843.248	916862.1	-541598	21.188	13.539	-82.594
	MTSP	957.751	1241208	264478.2	13.539	39.824	77.618
	P450	-1620757	-5.7E+07	-9830620	-82.594	77.618	80874.979
Covariance	TMETAL	1.2E+07	4.8E+08	9.3E+08	259.033	21.283	-36016.8
	WETDI	4.8E+08	2.6E+10	5.1E+10	23509.285	26982.789	-1245042
	WETACID	9.3E+08	5.1E+10	6.6E+10	-54159.8	18891.300	-702187
	MTOE	259.033	23509.285	-54159.8	.543	.347	-2.118
	MTSP	21.283	26982.789	18891.300	.347	.866	1.687
	P450	-36016.8	-1245042	-702187	-2.118	1.687	1758.152
N	TMETAL	51	51	20	39	46	46
	WETDI	51	52	20	40	47	47
	WETACID	20	20	20	11	15	15
	MTOE	39	40	11	40	40	40
	MTSP	46	47	15	40	47	47
	P450	46	47	15	40	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

SODIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.797**	.738**	.083	-.060	-.301*
		WETDI	.797**	1.000	.801**	.234	.121	-.338*
		WETACID	.738**	.801**	1.000	-.137	-.118	.073
		MTOE	.083	.234	-.137	1.000	.628**	.005
		MTSP	-.060	.121	-.118	.628**	1.000	.228
		P450	-.301*	-.338*	.073	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.000	.000	.614	.694	.042
		WETDI	.000	.	.000	.146	.419	.020
		WETACID	.000	.000	.	.689	.676	.795
		MTOE	.614	.146	.689	.	.000	.976
		MTSP	.694	.419	.676	.000	.	.123
		P450	.042	.020	.795	.976	.123	.
	N	TMETAL	51	51	20	39	46	46
		WETDI	51	52	20	40	47	47
		WETACID	20	20	20	11	15	15
		MTOE	39	40	11	40	40	40
		MTSP	46	47	15	40	47	47
		P450	46	47	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

THALLIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	1.4286	.5345	7
WETDI	4.0000	.	1
WETACID	27.9125	23.2648	8
MTOE	.6335	.7107	10
MTSP	.5471	.3606	14
P450	70.7143	48.7039	14

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.[a]	.[a]	-.424	-.037	-.081
	WETDI	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	WETACID	.[a]	.[a]	1.000	-.781	-.675	-.829*
	MTOE	-.424	.[a]	-.781	1.000	.418	-.392
	MTSP	-.037	.[a]	-.675	.418	1.000	.392
	P450	-.081	.[a]	-.829*	-.392	.392	1.000
Sig. (2-tailed)	TMETAL	.	.	.	.402	.937	.863
	WETDI	.	.	.	.	.	.
	WETACID	.	.	.	.429	.096	.021
	MTOE	.402	.	.429	.	.229	.263
	MTSP	.937	.	.096	.229	.	.166
	P450	.863	.	.021	.263	.166	.
Sum of Squares and Cross-products	TMETAL	1.714	.	.000	-.900	-3.86E-02	-11.143
	WETDI	.	.000	.	.000	.000	.000
	WETACID	.000	.	3788.749	-22.812	-32.172	-7099.214
	MTOE	-.900	.000	-22.812	4.545	.536	-91.302
	MTSP	-3.86E-02	.000	-32.172	.536	1.690	89.419
	P450	-11.143	.000	-7099.214	-91.302	89.419	30836.857
Covariance	TMETAL	.286	.	.	-.180	-6.43E-03	-1.857
	WETDI	.	.	.	.	.	.
	WETACID	.	.	541.250	-11.406	-5.362	-1183.202
	MTOE	-.180	.	-11.406	.505	5.955E-02	-10.145
	MTSP	-6.43E-03	.	-5.362	5.955E-02	.130	6.878
	P450	-1.857	.	-1183.202	-10.145	6.878	2372.066
N	TMETAL	7	0	1	6	7	7
	WETDI	0	1	0	1	1	1
	WETACID	1	0	8	3	7	7
	MTOE	6	1	3	10	10	10
	MTSP	7	1	7	10	14	14
	P450	7	1	7	10	14	14

*. Correlation is significant at the 0.05 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

THALLIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.	.	-.396	.000	.000
		WETDI	.	.	.	.	.	.
		WETACID	.	.	1.000	-.500	-.607	-.857*
		MTOE	-.396	.	-.500	1.000	.480	-.500
		MTSP	.000	.	-.607	.480	1.000	.200
		P450	.000	.	-.857*	-.500	.200	1.000
	Sig. (2-tailed)	TMETAL	.	.	.	.437	1.000	1.000
		WETDI	.	.	.	.	.	.
		WETACID	.	.	.	.667	.148	.014
		MTOE	.437	.	.667	.	.160	.141
		MTSP	1.000	.	.148	.160	.	.492
		P450	1.000	.	.014	.141	.492	.
	N	TMETAL	7	0	1	6	7	7
		WETDI	0	1	0	1	1	1
		WETACID	1	0	8	3	7	7
		MTOE	6	1	3	10	10	10
		MTSP	7	1	7	10	14	14
		P450	7	1	7	10	14	14

*. Correlation is significant at the .05 level (2-tailed).

VANADIUM

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	65.3654	23.7965	52
WETDI	58.9796	158.0404	49
WETACID	1584.6500	497.8193	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.039	.652**	-.106	-.100	-.033
	WETDI	.039	1.000	-.143	.067	-.118	-.074
	WETACID	.652**	-.143	1.000	.210	-.141	-.017
	MTOE	-.106	.067	.210	1.000	.470**	-.078
	MTSP	-.100	-.118	-.141	.470**	1.000	.043
	P450	-.033	-.074	-.017	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.789	.002	.514	.505	.828
	WETDI	.789	.	.560	.695	.447	.631
	WETACID	.002	.560	.	.536	.617	.953
	MTOE	.514	.695	.536	.	.002	.632
	MTSP	.505	.447	.617	.002	.	.773
	P450	.828	.631	.953	.632	.773	.
Sum of Squares and Cross-products	TMETAL	28880.058	7275.327	179003.0	-67.387	-92.647	-1364.234
	WETDI	7275.327	1198885	-320615	322.765	-784.894	-21477.0
	WETACID	179003.0	-320615	4708657	732.365	-515.014	-7425.600
	MTOE	-67.387	322.765	732.365	21.188	13.539	-82.594
	MTSP	-92.647	-784.894	-515.014	13.539	39.824	77.618
	P450	-1364.234	-21477.0	-7425.600	-82.594	77.618	80874.979
Covariance	TMETAL	566.276	151.569	9421.208	-1.728	-2.014	-29.657
	WETDI	151.569	24976.770	-17811.9	8.966	-18.253	-499.464
	WETACID	9421.208	-17811.9	247824.0	73.236	-36.787	-530.400
	MTOE	-1.728	8.966	73.236	.543	.347	-2.118
	MTSP	-2.014	-18.253	-36.787	.347	.866	1.687
	P450	-29.657	-499.464	-530.400	-2.118	1.687	1758.152
N	TMETAL	52	49	20	40	47	47
	WETDI	49	49	19	37	44	44
	WETACID	20	19	20	11	15	15
	MTOE	40	37	11	40	40	40
	MTSP	47	44	15	40	47	47
	P450	47	44	15	40	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

VANADIUM

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	-.086	.578**	-.089	-.065	.117
		WETDI	-.086	1.000	-.149	-.077	-.115	.245
		WETACID	.578**	-.149	1.000	-.048	-.227	.255
		MTOE	-.089	-.077	-.048	1.000	.628**	.005
		MTSP	-.065	-.115	-.227	.628**	1.000	.228
		P450	.117	.245	.255	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.556	.008	.584	.664	.433
		WETDI	.556	.	.544	.650	.458	.109
		WETACID	.008	.544	.	.889	.415	.358
		MTOE	.584	.650	.889	.	.000	.976
		MTSP	.664	.458	.415	.000	.	.123
		P450	.433	.109	.358	.976	.123	.
	N	TMETAL	52	49	20	40	47	47
		WETDI	49	49	19	37	44	44
		WETACID	20	19	20	11	15	15
		MTOE	40	37	11	40	40	40
		MTSP	47	44	15	40	47	47
		P450	47	44	15	40	47	47

**. Correlation is significant at the .01 level (2-tailed).

ZINC

Descriptive Statistics

	Mean	Std. Deviation	N
TMETAL	206.6346	408.1579	52
WETDI	373.3659	1337.0668	41
WETACID	4678.7000	3591.3150	20
MTOE	.8532	.7371	40
MTSP	.7749	.9304	47
P450	52.0213	41.9303	47

Correlations

		TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Pearson Correlation	TMETAL	1.000	.078	.446*	-.222	-.132	.134
	WETDI	.078	1.000	.304	.178	-.078	-.154
	WETACID	.446*	.304	1.000	-.049	-.294	-.333
	MTOE	-.222	.178	-.049	1.000	.470**	-.078
	MTSP	-.132	-.078	-.294	.470**	1.000	.043
	P450	.134	-.154	-.333	-.078	.043	1.000
Sig. (2-tailed)	TMETAL	.	.628	.049	.168	.378	.369
	WETDI	.628	.	.220	.339	.643	.356
	WETACID	.049	.220	.	.886	.288	.225
	MTOE	.168	.339	.886	.	.002	.632
	MTSP	.378	.643	.288	.002	.	.773
	P450	.369	.356	.225	.632	.773	.
Sum of Squares and Cross-products	TMETAL	8496238	1899701	2773885	-2957.175	-2418.048	111065.6
	WETDI	1899701	7.2E+07	3.8E+07	5977.183	-3751.406	-334883
	WETACID	2773885	3.8E+07	2.5E+08	-1272.027	-7693.492	-1061895
	MTOE	-2957.175	5977.183	-1272.027	21.188	13.539	-82.594
	MTSP	-2418.048	-3751.406	-7693.492	13.539	39.824	77.618
	P450	111065.6	-334883	-1061895	-82.594	77.618	80874.979
Covariance	TMETAL	166592.9	47492.519	145994.0	-75.825	-52.566	2414.469
	WETDI	47492.519	1787748	2253292	199.239	-101.389	-9050.884
	WETACID	145994.0	2253292	1.3E+07	-127.203	-549.535	-75849.6
	MTOE	-75.825	199.239	-127.203	.543	.347	-2.118
	MTSP	-52.566	-101.389	-549.535	.347	.866	1.687
	P450	2414.469	-9050.884	-75849.6	-2.118	1.687	1758.152
N	TMETAL	52	41	20	40	47	47
	WETDI	41	41	18	31	38	38
	WETACID	20	18	20	11	15	15
	MTOE	40	31	11	40	40	40
	MTSP	47	38	15	40	47	47
	P450	47	38	15	40	47	47

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

ZINC

Nonparametric Correlations

Correlations

			TMETAL	WETDI	WETACID	MTOE	MTSP	P450
Spearman's rho	Correlation Coefficient	TMETAL	1.000	.283	.529*	-.180	-.236	.045
		WETDI	.283	1.000	.674**	-.029	-.211	.160
		WETACID	.529*	.674**	1.000	.018	-.432	-.290
		MTOE	-.180	-.029	.018	1.000	.628**	.005
		MTSP	-.236	-.211	-.432	.628**	1.000	.228
		P450	.045	.160	-.290	.005	.228	1.000
	Sig. (2-tailed)	TMETAL	.	.073	.016	.265	.109	.763
		WETDI	.073	.	.002	.877	.203	.336
		WETACID	.016	.002	.	.958	.108	.295
		MTOE	.265	.877	.958	.	.000	.976
		MTSP	.109	.203	.108	.000	.	.123
		P450	.763	.336	.295	.976	.123	.
	N	TMETAL	52	41	20	40	47	47
		WETDI	41	41	18	31	38	38
		WETACID	20	18	20	11	15	15
		MTOE	40	31	11	40	40	40
		MTSP	47	38	15	40	47	47
		P450	47	38	15	40	47	47

*. Correlation is significant at the .05 level (2-tailed).

**. Correlation is significant at the .01 level (2-tailed).

APPENDIX S

TOXICITY REFERENCE VALUES FOR 2,3,7,8-TCDD

TOXICITY REFERENCE VALUES FOR 2,3,7,8-TCDD

The U.S. Environmental Protection Agency (EPA) developed wildlife criteria values analogous to low toxicity reference values (TRV) for Great Lakes Water Quality Initiative (EPA 1995). The Great Lakes documents are well respected and considered to be of high quality. In fact, the Navy's approach to deriving TRVs was modeled, in part, after the methods employed by EPA in establishing wildlife criteria values. These methods included review of the primary literature, calculation of doses, and application of uncertainty factors (UF) in order to arrive at a dose-based TRV in milligrams per kilogram per day (mg/kg-day). EPA did not, however, develop a low and a high wildlife criteria value. The single value developed by EPA is equivalent to the Navy's low TRV. Thus, the low TRV for TCDD was based on EPA's Great Lakes Water Quality Initiative wildlife criteria (EPA 1995). The rodent and avian high TRVs for TCDD were based on the same data set (EPA 1995), but represent a low adverse effect level (LOAEL) rather than a no adverse effect level (NOAEL) as described below. Confidence ratings were not applied to TRVs derived from the Great Lakes documents.

MAMMALIAN TRVs

The mammalian TRVs for TCDD were derived based on EPA's wildlife criterion for mammals. In the Great Lakes documents, the EPA reviewed toxicological data on TCDD from the primary literature on rodents, monkeys, and minks in order to derive a TRV for the mink and otter, which were the receptors of concern. The EPA based their criterion on a NOAEL for reproductive effects in Sprague-Dawley rats exposed at 0.001 μg/kg-day for 3 generations (Murray and others 1979, as cited in EPA 1995). At 0.001 μg/kg-day, there were no significant effects on fertility or pup weight in any of the three generations. This study was particularly sensitive, however, since the first (f_0) generation showed no effects to an oral dose of 0.01 μg/kg-day, but by the second and third generations, there was significantly reduced fertility at this oral dose. The Navy based both the low and high TRV on this study from the NOAEL and LOAEL, respectively. Therefore, the mammalian low TRV is 0.001 μg/kg-day and the high TRV is 0.01 μg/kg-day, and the dose should be allometrically converted to the receptor of concern using an estimated body weight of the Sprague-Dawley rats of 0.43 kilogram (EPA 1988).

AVIAN TRVs

The avian TRVs for 2,3,7,8-TCDD were derived based on EPA's wildlife criterion for birds. In the Great Lakes documents, the EPA reviewed toxicological data on TCDD from the primary literature on

turtle doves, chickens, pheasants, quail, bluebirds, and mallards in order to derive criteria for the kingfisher, herring gull, and bald eagle, which were the receptors of concern. The EPA based their criteria on a NOAEL for reproductive effects in pheasants exposed at 0.014 μg/kg-day (Nosek and others 1992 and 1993, as cited in EPA 1995). The EPA applied an UF of 10 since the study was a subchronic rather than chronic exposure. The Navy used the adjusted dose (0.0014 μg/kg-day) as the low TRV, and allometrically converted this dose to account for differences between the body weight of the test organism, and the avian receptors of concern.

The high TRV was also based on Nosek (1992, 1993). A LOAEL for TCDD of 0.14 μg/kg-day resulted in decreased egg production and increase in mortality of embryos from the fertilized eggs of those hens (Nosek 1992, as cited in EPA 1995). The dose was adjusted with an uncertainty factor of 10 to account for the subchronic instead of chronic exposure needed to predict effects in wild birds. Other studies cited in the EPA (1995) document reported mortality rather than reproductive endpoints. However, Hart and others (1991) studied hatchability and developmental effects of great blue heron eggs collected from the wild and found that heron embryos were relatively resistant to the effects of TCDD compared to chickens. However, the data from Hart and others (1991) was based on concentrations of dioxins (mixed) in eggs collected in the wild rather than on an oral dose of TCDD, only. Therefore, for the high TRV for 2,3,7,8-TCDD is 0.014 μg/kg-day based on the pheasant, and then is allometrically converted to the receptor of concern. The average body weight of the test species (pheasant hens) was identified in this study as 1.1 kilograms.

APPENDIX T

FOOD-CHAIN MODELING CALCULATIONS FOR RISK TO BIRDS AND MAMMALS

ATTACHMENT T1

FOOD-CHAIN MODELING CALCULATIONS FOR THE LANDFILL TERRESTRIAL UNIT

LIST OF TABLES

Table

T1-1 SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT

T1-2 SALT MARSH HARVEST MOUSE HAZARD QUOTIENT CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT

T1-3 GRAY FOX DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT

T1-4 GRAY FOX HAZARD QUOTIENT CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT

T1-5 NORTHERN HARRIER DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT

T1-6 NORTHERN HARRIER HAZARD QUOTIENT CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT

TABLE T1-1

SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	[Pickleweed] (mg/kg)	IR_{prey} (kg/d)	Ingestion from Prey (mg/d)	IR_{soil} (kg/d)	[Soil] (mg/kg)	Ingestion from Soil (mg/d)	SUF	BW (kg)	Dose[b] (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Aluminum	TLSSB004	High	14.30	0.004	0.05	0.0001	27400.00	2.30	1.00	0.01	261.29	NA	NA			
Antimony	TLSSB007	High	0.01	0.004	0.00004	0.0001	3.10	0.0003	1.00	0.01	0.03	NA	NA			
Arsenic	TLSSB007	High	0.25	0.004	0.001	0.0001	57.60	0.005	1.00	0.01	0.63	0.75	8.32	X		
Cadmium	TLSSB002	High	0.02	0.004	0.0001	0.0001	5.80	0.0005	1.00	0.01	0.06	0.08	3.41	X		
	TLSSB005	High	0.02	0.004	0.0001	0.0001	3.20	0.0003	1.00	0.01	0.04	0.08	3.41	X		
Copper	TLSSB002	High	1.00	0.004	0.004	0.0001	117.00	0.01	1.00	0.01	1.48	3.41	769.32	X		
	TLSSB004	High	1.00	0.004	0.004	0.0001	101.00	0.01	1.00	0.01	1.33	3.41	769.32	X		
	TLSSB007	High	1.00	0.004	0.004	0.0001	264.00	0.02	1.00	0.01	2.85	3.41	769.32	X		
Lead	TLSSB007	High	0.14	0.004	0.0005	0.0001	156.00	0.01	1.00	0.01	1.51	0.003	273.42		X	
Nickel	TLSSB002	High	0.17	0.004	0.001	0.0001	131.00	0.01	1.00	0.01	1.29	0.29	68.56		X	
Mercury	TLSSB004	High	0.01	0.004	0.00004	0.0001	0.48	0.00004	1.00	0.01	0.01	0.51	9.94	X		
	TLSSB007	High	0.01	0.004	0.00004	0.0001	0.38	0.00003	1.00	0.01	0.01	0.51	9.94	X		
Zinc	TLSSB002	High	3.60	0.004	0.01	0.0001	743.00	0.06	1.00	0.01	8.33	11.79	817.63	X		
	TLSSB005	High	3.60	0.004	0.01	0.0001	307.00	0.03	1.00	0.01	4.27	11.79	817.63	X		
Dieldrin	TLSSB001	High	NA	0.004	NA	0.0001	0.002	0.0000002	1.00	0.01	0.00002	NA	NA			
	TLSSB001	High	NA	0.004	NA	0.0001	0.002	0.0000002	1.00	0.01	0.00002	NA	NA			
Trans Nonachlor	TLSSB002	High	NA	0.004	NA	0.0001	0.004	0.0000003	1.00	0.01	0.00004	NA	NA			
Mirex	TLSSB002	High	NA	0.004	NA	0.0001	0.001	0.00000004	1.00	0.01	0.000005	NA	NA			
BHC	TLSSB001	High	NA	0.004	NA	0.0001	0.002	0.0000002	1.00	0.01	0.00002	NA	NA			
Total BHCs	TLSSB002	High	NA	0.004	NA	0.0001	0.02	0.000001	1.00	0.01	0.0001	NA	NA			
Total PCBs	TLSSB002	High	NA	0.004	NA	0.0001	0.64	0.00005	1.00	0.01	0.01	0.42	1.53	X		
2-Butanone	TLSSB004	High	NA	0.004	NA	0.0001	0.39	0.00003	1.00	0.01	0.004	NA	NA			
Acetone	TLSSB007	High	NA	0.004	NA	0.0001	0.58	0.00005	1.00	0.01	0.01	NA	NA			
Butylbenzolphth	TLSSB006	High	NA	0.004	NA	0.0001	0.05	0.000004	1.00	0.01	0.0004	NA	NA			
Benzoic Acid	TLSSB004	High	NA	0.004	NA	0.0001	1.10	0.0001	1.00	0.01	0.01	NA	NA			
Chloromethane	TLSSB001	High	NA	0.004	NA	0.0001	0.05	0.000004	1.00	0.01	0.0004	NA	NA			
Phenol	TLSSB004	High	NA	0.004	NA	0.0001	19.00	0.002	1.00	0.01	0.18	NA	NA			
Arsenic	TLSSB007	Low	0.25	0.003	0.001	0.0001	57.60	0.004	1.00	0.02	0.27	0.75	8.32	X		
Cadmium	TLSSB002	Low	0.02	0.003	0.0001	0.0001	5.80	0.0004	1.00	0.02	0.03	0.08	3.41	X		
	TLSSB005	Low	0.02	0.003	0.0001	0.0001	3.20	0.0002	1.00	0.02	0.02	0.08	3.41	X		
Copper	TLSSB002	Low	1.00	0.002	0.003	0.0001	117.00	0.01	1.00	0.02	0.62	3.41	769.32	X		
	TLSSB004	Low	1.00	0.003	0.003	0.0001	101.00	0.01	1.00	0.02	0.56	3.41	769.32	X		
	TLSSB007	Low	1.00	0.003	0.003	0.0001	264.00	0.02	1.00	0.02	1.19	3.41	769.32	X		
Lead	TLSSB007	Low	0.14	0.003	0.0004	0.0001	156.00	0.01	1.00	0.02	0.63	0.003	273.42		X	
Mercury	TLSSB004	Low	0.01	0.003	0.00003	0.0001	0.48	0.00003	1.00	0.02	0.003	0.51	9.94	X		
	TLSSB007	Low	0.01	0.003	0.00003	0.0001	0.38	0.00002	1.00	0.02	0.003	0.51	9.94	X		
Nickel	TLSSB002	Low	0.17	0.003	0.0004	0.0001	131.00	0.01	1.00	0.02	0.54	0.29	68.56		X	
Zinc	TLSSB002	Low	3.60	0.003	0.01	0.0001	743.00	0.05	1.00	0.02	3.48	11.79	817.63	X		
	TLSSB005	Low	3.60	0.003	0.01	0.0001	307.00	0.02	1.00	0.02	1.78	11.79	817.63	X		
Arsenic	---	Ambient[c]	NA	0.002	NA	0.0001	27.00	0.002	1.00	0.01	0.18	0.75	8.32	X		
Cadmium	---	Ambient[c]	NA	0.002	NA	0.0001	1.90	0.0001	1.00	0.01	0.01	0.08	3.41	X		
Copper	---	Ambient[c]	NA	0.002	NA	0.0001	81.00	0.01	1.00	0.01	0.53	3.41	769.32	X		
Lead	---	Ambient[c]	NA	0.002	NA	0.0001	95.00	0.007	1.00	0.01	0.62	0.003	273.42		X	

TABLE T1-1

SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	[Pickleweed] (mg/kg)	IR_{prey} (kg/d)	Ingestion from Prey (mg/d)	IR_{soil} (kg/d)	[Soil] (mg/kg)	Ingestion from Soil (mg/d)	SUF	BW (kg)	Dose[b] (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Mercury	---	Ambient[c]	NA	0.002	NA	0.0001	0.32	0.00002	1.00	0.01	0.002	0.51	9.94	X		
Nickel	---	Ambient[c]	NA	0.002	NA	0.0001	120.00	0.01	1.00	0.01	0.78	0.29	68.56		X	
Zinc	---	Ambient[c]	NA	0.002	NA	0.0001	264.00	0.02	1.00	0.01	1.73	11.79	817.63	X		

Notes:

BHC Hexachlorocyclohexane
BW Body weight
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PAH Polynuclear aromatic hydrocarbon
PCB Polychlorinated biphenyl
[Pickleweed] Concentration of chemical in pickleweed
[Soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value

a Chemicals were selected based on available TRV information
b Point doses were calculated for each sample location
c The Tidal Area 99th percent ambient value
--- Not applicable to the analysis

TABLE T1-2

SALT MARSH HARVEST MOUSE HAZARD QUOTIENT CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)
Arsenic	TLSSB007	0.63	0.27	0.75	8.32	0.03	0.85	0.08
Cadmium	TLSSB002	0.06	0.03	0.08	3.41	0.01	0.77	0.02
	TLSSB005	0.04	0.02	0.08	3.41	0.005	0.47	0.01
Copper	TLSSB002	1.48	0.62	3.41	769.32	0.001	0.43	0.002
	TLSSB004	1.33	0.56	3.41	769.32	0.001	0.39	0.002
	TLSSB007	2.85	1.19	3.41	769.32	0.002	0.84	0.004
Lead	TLSSB007	1.51	0.63	0.003	273.42	0.002	**503.48**	0.01
Mercury	TLSSB004	0.01	0.003	0.51	9.94	0.0004	0.02	0.001
	TLSSB007	0.01	0.003	0.51	9.94	0.0003	0.01	0.001
Nickel	TLSSB002	1.29	0.54	0.29	68.56	0.01	**4.46**	0.02
Zinc	TLSSB002	8.33	3.48	11.79	817.63	0.004	0.71	0.01
	TLSSB005	4.27	1.78	11.79	817.63	0.002	0.36	0.01
Arsenic	Ambient[a]	0.18	NA	0.75	8.32	NA	0.24	NA
Cadmium	Ambient[a]	0.01	NA	0.08	3.41	NA	0.16	NA
Copper	Ambient[a]	0.53	NA	3.41	769.32	NA	0.16	NA
Lead	Ambient[a]	0.62	NA	0.003	273.42	NA	**206.96**	NA
Mercury	Ambient[a]	0.002	NA	0.51	9.94	NA	0.004	NA
Nickel	Ambient[a]	0.78	NA	0.29	68.56	NA	**2.71**	NA
Zinc	Ambient[a]	1.73	NA	11.79	817.63	NA	0.15	NA

Notes: **Bold font indicates an HQ greater than 1**

HQ Hazard quotient

mg/kg/day Milligrams per kilogram per day

TRV Toxicity reference value

NA Not available

a The Tidal Area 99th percent ambient value

TABLE T1-3

GRAY FOX DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose[b] (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	TLSSB007	High	1/2 DL[c]	0.21	0.34	0.07	57.60	0.01	0.55	0.75	2.95	0.16	0.17	1.93	X		
Cadmium	TLSSB002	High	217RAC3	0.03	0.34	0.01	5.80	0.01	0.06	0.75	2.95	0.02	0.02	0.79	X		
	TLSSB005	High	217RAC3	0.03	0.34	0.01	3.20	0.01	0.03	0.75	2.95	0.01	0.02	0.79	X		
Copper	TLSSB002	High	217RAC3	2.60	0.34	0.89	117.00	0.01	1.12	0.75	2.95	0.51	0.79	178.90	X		
	TLSSB004	High	217RAC3	2.60	0.34	0.89	101.00	0.01	0.97	0.75	2.95	0.47	0.79	178.90	X		
	TLSSB007	High	217RAC3	2.60	0.34	0.89	264.00	0.01	2.53	0.75	2.95	0.87	0.79	178.90		X	
Lead	TLSSB007	High	217RAC2	1.20	0.34	0.41	156.00	0.01	1.49	0.75	2.95	0.48	0.00	63.58		X	
Mercury	TLSSB004	High	217RAC3	0.02	0.34	0.01	0.48	0.01	0.00	0.75	2.95	0.003	0.02	0.18	X		
	TLSSB007	High	217RAC3	0.02	0.34	0.01	0.38	0.01	0.00	0.75	2.95	0.003	0.02	0.18	X		
Nickel	TLSSB002	High	217RAC3	0.87	0.34	0.30	131.00	0.01	1.25	0.75	2.95	0.39	0.07	15.94		X	
Zinc	TLSSB002	High	217RAC2	41.90	0.34	14.33	743.00	0.01	7.12	0.75	2.95	5.45	2.74	190.13		X	
	TLSSB005	High	217RAC2	41.90	0.34	14.33	307.00	0.01	2.94	0.75	2.95	4.39	2.74	190.13		X	
Alpha-Chlordane	TLSSB005	High	1/2 DL[c]	0.001	0.34	0.0003	0.002	0.01	0.00001	0.75	2.95	0.0001	0.23	2.36	X		
	TLSSB006	High	1/2 DL[c]	0.001	0.34	0.0003	0.002	0.01	0.00001	0.75	2.95	0.0001	0.23	2.36	X		
	TLSSB008	High	1/2 DL[c]	0.001	0.34	0.0003	0.004	0.01	0.00004	0.75	2.95	0.0001	0.23	2.36	X		
Total Chlordanes	TLSSB002	High	217RAC2	0.002	0.34	0.001	0.01	0.01	0.00005	0.75	2.95	0.0002	0.23	2.36	X		
Total DDTs[d]	TLSSB001	High	217RAC2	0.02	0.34	0.01	0.05	0.01	0.0005	0.75	2.95	0.002	0.43	8.60	X		
	TLSSB002	High	217RAC2	0.02	0.34	0.01	0.02	0.01	0.0002	0.75	2.95	0.002	0.43	8.60	X		
	TLSSB005	High	217RAC2	0.02	0.34	0.01	0.02	0.01	0.0002	0.75	2.95	0.002	0.43	8.60	X		
	TLSSB006	High	217RAC2	0.02	0.34	0.01	0.01	0.01	0.0001	0.75	2.95	0.002	0.43	8.60	X		
	TLSSB008	High	217RAC2	0.02	0.34	0.01	0.01	0.01	0.00005	0.75	2.95	0.002	0.43	8.60	X		
Arsenic	TLSSB007	Low	1/2 DL[c]	0.21	0.17	0.04	57.60	0.005	0.27	0.50	7.04	0.02	0.17	1.93	X		
Cadmium	TLSSB002	Low	217RAC3	0.03	0.17	0.01	5.80	0.005	0.03	0.50	7.04	0.002	0.02	0.79	X		
	TLSSB005	Low	217RAC3	0.03	0.17	0.01	3.20	0.005	0.02	0.50	7.04	0.001	0.02	0.79	X		
Copper	TLSSB002	Low	217RAC3	2.60	0.17	0.43	117.00	0.005	0.55	0.50	7.04	0.07	0.79	178.90	X		
	TLSSB004	Low	217RAC3	2.60	0.17	0.43	101.00	0.005	0.47	0.50	7.04	0.06	0.79	178.90	X		
	TLSSB007	Low	217RAC3	2.60	0.17	0.43	264.00	0.005	1.24	0.50	7.04	0.12	0.79	178.90	X		
Lead	TLSSB007	Low	217RAC2	1.20	0.17	0.20	156.00	0.005	0.73	0.50	7.04	0.07	0.00	63.58		X	
Mercury	TLSSB004	Low	217RAC3	0.02	0.17	0.003	0.48	0.005	0.002	0.50	7.04	0.0004	0.02	0.18	X		
	TLSSB007	Low	217RAC3	0.02	0.17	0.003	0.38	0.005	0.002	0.50	7.04	0.0004	0.02	0.18	X		
Nickel	TLSSB002	Low	217RAC3	0.87	0.17	0.15	131.00	0.005	0.62	0.50	7.04	0.05	0.07	15.94	X		
Zinc	TLSSB002	Low	217RAC2	41.90	0.17	7.00	743.00	0.005	3.49	0.50	7.04	0.74	2.74	190.13	X		
	TLSSB005	Low	217RAC2	41.90	0.17	7.00	307.00	0.005	1.44	0.50	7.04	0.60	2.74	190.13	X		
Alpha-Chlordane	TLSSB005	Low	1/2 DL[c]	0.001	0.17	0.0002	0.002	0.005	0.00001	0.50	7.04	0.00001	0.23	2.36	X		
	TLSSB006	Low	1/2 DL[c]	0.001	0.17	0.0002	0.002	0.005	0.00001	0.50	7.04	0.00001	0.23	2.36	X		
	TLSSB008	Low	1/2 DL[c]	0.001	0.17	0.0002	0.004	0.005	0.00002	0.50	7.04	0.00001	0.23	2.36	X		
Total Chlordanes	TLSSB002	Low	217RAC2	0.002	0.17	0.0003	0.01	0.005	0.00002	0.50	7.04	0.00002	0.23	2.36	X		
Total DDTs[d]	TLSSB001	Low	217RAC2	0.02	0.17	0.003	0.05	0.005	0.0002	0.50	7.04	0.0002	0.43	8.60	X		
	TLSSB002	Low	217RAC2	0.02	0.17	0.003	0.02	0.005	0.0001	0.50	7.04	0.0002	0.43	8.60	X		
	TLSSB005	Low	217RAC2	0.02	0.17	0.003	0.02	0.005	0.0001	0.50	7.04	0.0002	0.43	8.60	X		

TABLE T1-3

GRAY FOX DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose[b] (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Total DDTs[d]	TLSSB006	Low	217RAC2	0.02	0.17	0.003	0.01	0.005	0.00004	0.50	7.04	0.0002	0.43	8.60	X		
	TLSSB008	Low	217RAC2	0.02	0.17	0.003	0.01	0.005	0.00002	0.50	7.04	0.0002	0.43	8.60	X		
Arsenic	TLSSB007	Typical	1/2 DL[c]	0.21	0.25	0.05	57.60	0.01	0.41	0.75	3.84	0.09	0.17	1.93	X		
Cadmium	TLSSB002	Typical	217RAC3	0.03	0.25	0.01	5.80	0.01	0.04	0.75	3.84	0.01	0.02	0.79	X		
Copper	TLSSB007	Typical	217RAC3	2.60	0.25	0.66	264.00	0.01	1.88	0.75	3.84	0.50	0.79	178.90	X		
Lead	TLSSB007	Typical	217RAC2	1.20	0.25	0.31	156.00	0.01	1.11	0.75	3.84	0.28	0.00	63.58		X	
Nickel	TLSSB002	Typical	217RAC3	0.87	0.25	0.22	131.00	0.01	0.94	0.75	3.84	0.23	0.07	15.94		X	
Zinc	TLSSB002	Typical	217RAC2	41.90	0.25	10.66	743.00	0.01	5.31	0.75	3.84	3.12	2.74	190.13		X	
	TLSSB005	Typical	217RAC2	41.90	0.25	10.66	307.00	0.01	2.19	0.75	3.84	2.51	2.74	190.13	X		
Copper	---	Ambient[e]	NA	NA	0.34	NA	81.00	0.01	0.78	0.75	2.95	0.20	0.79	178.90	X		
Lead	---	Ambient[e]	NA	NA	0.34	NA	95.00	0.01	0.91	0.75	2.95	0.23	0.00	63.58		X	
Nickel	---	Ambient[e]	NA	NA	0.34	NA	120.00	0.01	1.15	0.75	2.95	0.29	0.07	15.94		X	
Zinc	---	Ambient[e]	NA	NA	0.34	NA	264.00	0.01	2.53	0.75	2.95	0.64	2.74	190.13	X		

Notes:

BW Body weight
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[prey] Concentration of chemical in prey
[soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value
95UCL The dose for the 95 percent upper confidence limit was only calculated for chemicals with an HQ greater than 1

a Chemicals were selected based on available TRV information
b Point doses were calculated for each sample location
c One-half the detection limit was used as the concentration when a chemical was below the DL
d Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
e The Tidal Area 99th percent ambient value
--- Not applicable to the analysis

TABLE T1-4

GRAY FOX HAZARD QUOTIENT CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	TLSSB007	0.16	0.02	0.09	0.17	1.93	0.01	0.91	0.08	0.52	0.05
Cadmium	TLSSB002	0.02	0.002	0.01	0.02	0.79	0.003	0.84	0.02	0.48	0.01
	TLSSB005	0.01	0.001	NA	0.02	0.79	0.002	0.52	0.01	NA	NA
Copper	TLSSB002	0.51	0.07	NA	0.79	178.90	0.0004	0.64	0.003	NA	NA
	TLSSB007	0.87	0.12	0.50	0.79	178.90	0.001	**1.09**	0.005	0.63	0.003
	TLSSB004	0.47	0.06	NA	0.79	178.90	0.0004	0.59	0.003	NA	NA
Lead	TLSSB007	0.48	0.07	0.28	0.001	63.58	0.001	**691.85**	0.01	**396.29**	0.004
Mercury	TLSSB004	0.003	0.0004	NA	0.02	0.18	0.002	0.16	0.02	NA	NA
	TLSSB007	0.003	0.0004	NA	0.02	0.18	0.002	0.15	0.01	NA	NA
Nickel	TLSSB002	0.39	0.05	0.23	0.07	15.94	0.003	**5.89**	0.02	**3.37**	0.01
Zinc	TLSSB002	5.45	0.74	3.12	2.74	190.13	0.004	**1.99**	0.03	**1.14**	0.02
	TLSSB005	4.39	0.60	2.51	2.74	190.13	0.003	**1.60**	0.02	0.92	0.01
Alpha-Chlordane	TLSSB005	0.004	0.001	NA	0.23	2.36	0.0002	0.02	0.002	NA	NA
	TLSSB006	0.004	0.001	NA	0.23	2.36	0.0002	0.02	0.002	NA	NA
	TLSSB008	0.01	0.001	NA	0.23	2.36	0.001	0.04	0.004	NA	NA
Total Chlordanes	TLSSB002	0.0002	0.00002	NA	0.23	2.36	0.00001	0.001	0.0001	NA	NA
Total DDTs[a]	TLSSB001	0.002	0.0002	NA	0.43	8.60	0.00003	0.004	0.0002	NA	NA
	TLSSB002	0.002	0.0002	NA	0.43	8.60	0.00002	0.004	0.0002	NA	NA
	TLSSB005	0.002	0.0002	NA	0.43	8.60	0.00002	0.004	0.0002	NA	NA
	TLSSB006	0.002	0.0002	NA	0.43	8.60	0.00002	0.004	0.0002	NA	NA
	TLSSB008	0.002	0.0002	NA	0.43	8.60	0.00002	0.004	0.0002	NA	NA
Copper	Ambient[b]	0.20	NA	NA	0.79	178.90	NA	0.25	0.001	NA	NA
Lead	Ambient[b]	0.23	NA	NA	0.001	63.58	NA	**330.54**	0.004	NA	NA
Nickel	Ambient[b]	0.29	NA	NA	0.07	15.94	NA	**4.36**	0.02	NA	NA
Zinc	Ambient[b]	0.64	NA	NA	2.74	190.13	NA	0.23	0.003	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

Total DDTs The sum of Dichlorodiphenyldichloroethane (DDD), Dichlorodiphenyldichloroethene (DDE), and Dichlorodiphenyltrichloroethane (DDT)

HQ Hazard quotient

mg/kg/day Milligrams per kilogram per day

NA Not available

TRV Toxicity reference value

a Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT

b The Tidal Area 99th percent ambient value

TABLE T1-5

NORTHERN HARRIER DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	TLSSB007	High	1/2 DL[b]	0.21	0.04	0.01	57.60	0.0003	0.02	1.00	0.30	0.09	14.64	58.57	X		
Cadmium	TLSSB002	High	217RAC3	0.03	0.04	0.001	5.80	0.0003	0.002	1.00	0.30	0.01	0.15	1.99	X		
	TLSSB005	High	217RAC3	0.03	0.04	0.001	3.20	0.0003	0.0009	1.00	0.30	0.01	0.15	1.99	X		
Copper	TLSSB002	High	217RAC3	2.60	0.04	0.11	117.00	0.0003	0.03	1.00	0.30	0.48	3.34	48.52	X		
	TLSSB004	High	217RAC3	2.60	0.04	0.11	101.00	0.0003	0.03	1.00	0.30	0.46	3.34	48.52	X		
	TLSSB007	High	217RAC3	2.60	0.04	0.11	264.00	0.0003	0.08	1.00	0.30	0.62	3.34	48.52	X		
Lead	TLSSB007	High	217RAC2	1.20	0.04	0.05	156.00	0.0003	0.05	1.00	0.30	0.32	0.003	15.89		X	
Mercury	TLSSB004	High	217RAC3	0.02	0.04	0.001	0.48	0.0003	0.0001	1.00	0.30	0.003	0.09	0.41	X		
	TLSSB007	High	217RAC3	0.02	0.04	0.001	0.38	0.0003	0.0001	1.00	0.30	0.003	0.09	0.41	X		
Nickel	TLSSB002	High	217RAC3	0.87	0.04	0.04	131.00	0.0003	0.04	1.00	0.30	0.25	1.92	72.76	X		
Zinc	TLSSB002	High	217RAC2	41.90	0.04	1.74	743.00	0.0003	0.22	1.00	0.30	6.56	37.29	372.89	X		
	TLSSB005	High	217RAC2	41.90	0.04	1.74	307.00	0.0003	0.09	1.00	0.30	6.13	37.29	372.89	X		
4,4'-DDE	TLSSB001	High	1/2 DL[b]	0.01	0.04	0.0004	0.01	0.0003	0.000002	1.00	0.30	0.001	NA	1.36	X		
	TLSSB006	High	1/2 DL[b]	0.01	0.04	0.0004	0.003	0.0003	0.000001	1.00	0.30	0.001	0.07	1.36	X		
4,4'-DDT	TLSSB001	High	217RAC1	0.001	0.04	0.00004	0.002	0.0003	0.000001	1.00	0.30	0.0001	0.07	3.41	X		
DDE	TLSSB002	High	217RAC1	0.01	0.04	0.0004	0.01	0.0003	0.000002	1.00	0.30	0.001	NA	1.36	X		
DDT	TLSSB002	High	217RAC1	0.001	0.04	0.00004	0.003	0.0003	0.000001	1.00	0.30	0.0001	0.07	3.41	X		
Total DDTs[c]	TLSSB001	High	217RAC2	0.02	0.04	0.001	0.05	0.0003	0.00001	1.00	0.30	0.002	0.07	3.41	X		
	TLSSB002	High	217RAC2	0.02	0.04	0.001	0.02	0.0003	0.000005	1.00	0.30	0.002	0.07	3.41	X		
	TLSSB005	High	217RAC2	0.02	0.04	0.001	0.02	0.0003	0.00001	1.00	0.30	0.002	0.07	3.41	X		
	TLSSB006	High	217RAC2	0.02	0.04	0.001	0.01	0.0003	0.000002	1.00	0.30	0.002	0.07	3.41	X		
	TLSSB008	High	217RAC2	0.02	0.04	0.001	0.01	0.0003	0.000001	1.00	0.30	0.002	0.07	3.41	X		
Arsenic	TLSSB007	Low	1/2 DL[b]	0.21	0.03	0.01	57.60	0.0002	0.01	0.75	0.60	0.02	14.64	58.57	X		
Cadmium	TLSSB002	Low	217RAC3	0.03	0.03	0.001	5.80	0.0002	0.001	0.75	0.60	0.002	0.15	1.99	X		
	TLSSB005	Low	217RAC3	0.03	0.03	0.001	3.20	0.0002	0.001	0.75	0.60	0.002	0.15	1.99	X		
Copper	TLSSB004	Low	217RAC3	2.60	0.03	0.07	101.00	0.0002	0.02	0.75	0.60	0.11	3.34	48.52	X		
	TLSSB002	Low	217RAC3	2.60	0.03	0.07	117.00	0.0002	0.02	0.75	0.60	0.11	3.34	48.52	X		
	TLSSB007	Low	217RAC3	2.60	0.03	0.07	264.00	0.0002	0.05	0.75	0.60	0.15	3.34	48.52	X		
Lead	TLSSB007	Low	217RAC2	1.20	0.03	0.03	156.00	0.0002	0.03	0.75	0.60	0.08	0.00	15.89		X	
Mercury	TLSSB004	Low	217RAC3	0.02	0.03	0.001	0.48	0.0002	0.0001	0.75	0.60	0.001	0.09	0.41	X		
	TLSSB007	Low	217RAC3	0.02	0.03	0.001	0.38	0.0002	0.0001	0.75	0.60	0.001	0.09	0.41	X		
Nickel	TLSSB002	Low	217RAC3	0.87	0.03	0.02	131.00	0.0002	0.02	0.75	0.60	0.06	1.92	72.76	X		
Zinc	TLSSB002	Low	217RAC2	41.90	0.03	1.11	743.00	0.0002	0.14	0.75	0.60	1.57	37.29	372.89	X		
	TLSSB005	Low	217RAC2	41.90	0.03	1.11	307.00	0.0002	0.06	0.75	0.60	1.47	37.29	372.89	X		
4,4'-DDE	TLSSB001	Low	1/2 DL[b]	0.01	0.03	0.0003	0.01	0.0002	0.000001	0.75	0.60	0.0003	0.07	1.36	X		
	TLSSB006	Low	1/2 DL[b]	0.01	0.03	0.0003	0.003	0.0002	0.000001	0.75	0.60	0.0003	0.07	1.36	X		
4,4'-DDT	TLSSB001	Low	217RAC1	0.001	0.03	0.00002	0.002	0.0002	0.0000004	0.75	0.60	0.00003	0.07	3.41	X		
DDT	TLSSB002	Low	217RAC1	0.001	0.03	0.00002	0.003	0.0002	0.000001	0.75	0.60	0.00003	0.07	3.41	X		
DDE	TLSSB002	Low	217RAC1	0.01	0.03	0.0003	0.01	0.0002	0.000001	0.75	0.60	0.0003	NA	1.36	X		
Total DDTs[c]	TLSSB001	Low	217RAC2	0.02	0.03	0.0005	0.05	0.0002	0.00001	0.75	0.60	0.001	0.07	3.41	X		
	TLSSB002	Low	217RAC2	0.02	0.03	0.0005	0.02	0.0002	0.000003	0.75	0.60	0.001	0.07	3.41	X		
	TLSSB005	Low	217RAC2	0.02	0.03	0.0005	0.02	0.0002	0.000003	0.75	0.60	0.001	0.07	3.41	X		
	TLSSB006	Low	217RAC2	0.02	0.03	0.0005	0.01	0.0002	0.000002	0.75	0.60	0.001	0.07	3.41	X		
	TLSSB008	Low	217RAC2	0.02	0.03	0.0005	0.01	0.0002	0.000001	0.75	0.60	0.001	0.07	3.41	X		

TABLE T1-5

NORTHERN HARRIER DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Lead	TLSSB007	Typical	217RAC2	1.20	0.03	0.04	156.00	0.0002	0.04	0.75	0.44	0.13	0.003	15.89		X	
Lead	---	Ambient Hi	NA	NA	0.04	NA	95.00	0.0003	0.03	0.75	0.30	0.07	0.003	15.89		X	

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value

DDE Dichlorodiphenyldichloroethene

DDT Dichlorodiphenyltrichloroethane

DL Detection limit

BW Body weight

IR_{prey} Ingestion rate of prey

IR_{soil} Ingestion rate of soil

kg/day Kilograms per day

mg/d Milligrams per day

mg/kg Milligrams per kilogram

mg/kg/day Milligrams per kilogram per day

NA Not available

[prey] Concentration of chemical in prey

[soil] Concentration of chemical in soil

SUF Site use factor

TRV Toxicity reference value

a Chemicals were selected based on available TRV information

b One-half the detection limit was used as the concentration when a chemical was below the DL

c Total DDTs are the sum of dichlorodiphenyldichloroethane, DDE, and DDT

TABLE T1-6

NORTHERN HARRIER DOSE CALCULATIONS IN THE LANDFILL TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	TLSSB007	0.09	0.02	NA	14.64	58.57	0.0003	0.01	0.001	NA	NA
Cadmium	TLSSB002	0.01	0.002	NA	0.15	1.99	0.001	0.07	0.005	NA	NA
	TLSSB005	0.01	0.002	NA	0.15	1.99	0.001	0.05	0.004	NA	NA
Copper	TLSSB002	0.48	0.11	NA	3.34	48.52	0.002	0.14	0.01	NA	NA
	TLSSB004	0.46	0.11	NA	3.34	48.52	0.002	0.14	0.01	NA	NA
	TLSSB007	0.62	0.15	NA	3.34	48.52	0.003	0.19	0.01	NA	NA
Lead	TLSSB007	0.32	0.08	0.13	0.003	15.89	0.005	**106.48**	0.02	**44.18**	0.01
Mercury	TLSSB004	0.003	0.001	NA	0.09	0.41	0.002	0.04	0.01	NA	NA
	TLSSB007	0.003	0.001	NA	0.09	0.41	0.002	0.04	0.01	NA	NA
Nickel	TLSSB002	0.25	0.06	NA	1.92	72.76	0.001	0.13	0.003	NA	NA
Zinc	TLSSB002	6.56	1.57	NA	37.29	372.89	0.004	0.18	0.02	NA	NA
	TLSSB005	6.13	1.47	NA	37.29	372.89	0.004	0.16	0.02	NA	NA
4,4'-DDE	TLSSB001	0.001	0.0003	NA	0.07	1.36	0.0002	0.02	0.001	NA	NA
	TLSSB006	0.001	0.0003	NA	0.07	1.36	0.0002	0.02	0.001	NA	NA
4,4'-DDT	TLSSB001	0.0001	0.00003	NA	0.07	3.41	0.00000	0.002	0.00004	NA	NA
DDE	TLSSB002	0.001	0.0003	NA	NA	1.36	0.0002	NA	0.001	NA	NA
DDT	TLSSB002	0.0001	0.00003	NA	0.07	3.41	0.00001	0.002	0.00004	NA	NA
Total DDTs[a]	TLSSB001	0.002	0.001	NA	0.07	3.41	0.0002	0.03	0.001	NA	NA
	TLSSB002	0.002	0.001	NA	0.07	3.41	0.0002	0.03	0.001	NA	NA
	TLSSB005	0.002	0.001	NA	0.07	3.41	0.0002	0.03	0.001	NA	NA
	TLSSB006	0.002	0.001	NA	0.07	3.41	0.0002	0.03	0.001	NA	NA
	TLSSB008	0.002	0.001	NA	0.07	3.41	0.0002	0.03	0.001	NA	NA
Lead	Ambient Hi	0.07	NA	NA	0.003	15.89	NA	23.19	NA	NA	NA

Notes: Bold font indicates an HQ greater than 1

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
NA Not available
TRV Toxicity reference value

a Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT

ATTACHMENT T2

FOOD-CHAIN MODELING CALCULATIONS FOR THE R AREA TERRESTRIAL UNIT

LIST OF TABLES

Table

T2-1 SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT

T2-2 SALT MARSH HARVEST MOUSE HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL UNIT

T2-3 GRAY FOX DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT

T2-4 GRAY FOX HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL UNIT

T2-5 NORTHERN HARRIER DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT

T2-6 NORTHERN HARRIER HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL UNIT

TABLE T2-1

SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	[Pickleweed] (mg/kg)	IR_{prey} (kg/d)	Ingestion from Prey (mg/d)	IR_{soil} (kg/d)	[Soil] (mg/kg)	Ingestion from Soil (mg/d)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Aluminum	RADSBF05	High	14 30	0.004	0.05	0.0001	33700.00	2.83	1.00	0.009	320.09	NA	NA			
Arsenic	RADSBJ04	High	0.25	0.004	0.0009	0.0001	42.00	0.004	1.00	0.009	0.49	0.75	8.32	X		
Cobalt	RADSBH06	High	0.13	0.004	0.0005	0.0001	108.00	0.01	1.00	0.009	1.06	2.68	41.30	X		
Copper	RADSBE07	High	1.00	0.004	0.004	0.0001	87.80	0.01	1.00	0.009	1.21	3.41	769.32	X		
Lead	RADSBG08	High	0.14	0.004	0.0005	0.0001	1160.00	0.10	1.00	0.009	10.88	0.003	273.42		X	
	95UCL[b]	High	0.14	0.004	0.0005	0.0001	83.30	0.01	1.00	0.009	0.83	0.003	273.42		X	
Manganese	RADSBI08	High	14.40	0.004	0.05	0.0001	6300.00	0.53	1.00	0.009	64.40	18.24	203.93		X	
	95UCL[b]	High	14.40	0.004	0.05	0.0001	581.00	0.05	1.00	0.009	11.02	18.24	203.93	X		
Mercury	RADSB012	High	0.01	0.004	0.00004	0.0001	0.58	0.00005	1.00	0.009	0.01	0.51	9.94	X		
Nickel	RADSBH06	High	0.17	0.004	0.001	0.0001	242.00	0.02	1.00	0.009	2 32	0.29	68.56		X	
	95UCL[b]	High	0.17	0.004	0.001	0.0001	74.70	0.01	1.00	0.009	0.76	0.29	68.56		X	
Selenium	RADSBG08	High	0.19	0.004	0.001	0.0001	1.30	0.0001	1.00	0.009	0.09	0.10	1.47	X		
Thallium	RADSBI08	High	0.31	0.004	0.001	0.0001	5.40	0.0005	1.00	0.009	0.17	0.75	2.22	X		
Zinc	RADSB017	High	3.60	0.004	0.01	0.0001	959.00	0.08	1.00	0.009	10.35	11.79	817.63	X		
Dieldrin	RADSB011	High	NA	0.004	NA	0.0001	0.002	0.0000002	1.00	0.009	0.00002	NA	NA			
Heptachlor	RADSBC05	High	NA	0.004	NA	0.0001	0.0004	0.00000004	1.00	0.009	0.000004	0.23	14.04	X		
Lindane	RADSBG04	High	NA	0.004	NA	0.0001	0.001	0.0000001	1.00	0.009	0.00001	0.10	4.54	X		
Mirex	RADSB011	High	NA	0.004	NA	0.0001	0.001	0.0000001	1.00	0.009	0.00001	NA	NA			
Total DDTs[c]	RADSB011	High	NA	0.004	NA	0.0001	0.07	0.00001	1.00	0.009	0.001	1.85	36.98	X		
Total PCBs	RADSBE03	High	NA	0.004	NA	0.0001	0.57	0.00005	1.00	0.009	0.01	0.42	1.53	X		
Total PAHs	RADSB013	High	NA	0.004	NA	0.0001	6.62	0.001	1.00	0.009	0.06	1.68	42.10	X		
Arsenic	RADSBJ04	Low	0.25	0.003	0.001	0.0001	42.00	0.003	1.00	0.016	0.20	0.75	8.32	X		
Cobalt	RADSBH06	Low	0.13	0.003	0.0003	0.0001	108.00	0.01	1.00	0.016	0.44	2.68	41.30	X		
Copper	RADSBE07	Low	1.00	0.003	0.003	0.0001	87.80	0.01	1.00	0.016	0.50	3.41	769.32	X		
Lead	RADSBG08	Low	0.14	0.003	0.0004	0.0001	1160.00	0.07	1.00	0 016	4.55	0.003	273.42		X	
	95UCL[b]	Low	0.14	0.003	0.0004	0.0001	83.30	0.01	1.00	0.016	0.35	0.003	273.42		X	
Manganese	RADSBI08	Low	14.40	0.003	0.04	0.0001	6300.00	0.39	1.00	0.016	26.91	18.24	203.93		X	
	95UCL[b]	Low	14.40	0.003	0.04	0.0001	581.00	0.04	1.00	0.016	4.61	18.24	203.93	X		
Mercury	RADSB012	Low	0.01	0.003	0.00003	0.0001	0.58	0.00004	1.00	0.016	0.004	0.51	9.94	X		
Nickel	RADSBH06	Low	0.17	0.003	0 0004	0.0001	242.00	0.02	1.00	0.016	0.97	0.29	68.56		X	
	95UCL[b]	Low	0.17	0.003	0.0004	0.0001	74.70	0.005	1.00	0.016	0.32	0.29	68.56		X	
Selenium	RADSBG08	Low	0.19	0.003	0.0005	0.0001	1.30	0.0001	1.00	0.016	0.04	0.10	1.47	X		
Thallium	RADSBI08	Low	0.31	0.003	0.001	0.0001	5.40	0.0003	1.00	0.016	0.07	0.75	2.22	X		
Zinc	RADSB017	Low	3.60	0 003	0.01	0.0001	959.00	0.06	1.00	0.016	4.33	11.79	817.63	X		
Heptachlor	RADSBC05	Low	NA	0.003	NA	0.0001	0.0004	0.00000003	1.00	0.016	0.000002	0.23	14.04	X		
Lindane	RADSBG04	Low	NA	0.003	NA	0.0001	0.001	0.0000001	1.00	0.016	0.000003	0.10	4.54	X		
Total DDTs[c]	RADSB011	Low	NA	0.003	NA	0.0001	0.07	0.000005	1.00	0.016	0.0003	1.85	36.98	X		
Total PCBs	RADSBE03	Low	NA	0.003	NA	0.0001	0.57	0.00004	1.00	0.016	0.002	0.42	1.53	X		
Total PAHs	RADSB013	Low	NA	0.003	NA	0.0001	6.62	0 0004	1.00	0.016	0.03	1.68	42.10	X		
Arsenic	---	Ambient Hi	NA	0.004	NA	0.0001	27.00	0.002	1.00	0.009	0.25	0.75	8.32	X		
Copper	---	Ambient Hi	NA	0.004	NA	0.0001	81.00	0.01	1.00	0.009	0.76	3.41	769.32	X		
Lead	---	Ambient Hi	NA	0.004	NA	0.0001	95.00	0.01	1.00	0.009	0.89	0.003	273.42		X	
Manganese	---	Ambient Hi	NA	0.004	NA	0.0001	1500.00	0.13	1.00	0.009	14.00	18.24	203.93	X		
Mercury	---	Ambient Hi	NA	0.004	NA	0.0001	0.32	0.00003	1.00	0.009	0.003	0.51	9.94	X		

TABLE T2-1

SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	[Pickleweed] (mg/kg)	IR_{prey} (kg/d)	Ingestion from Prey (mg/d)	IR_{soil} (kg/d)	[Soil] (mg/kg)	Ingestion from Soil (mg/d)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Nickel	---	Ambient Hi	NA	0.004	NA	0.0001	120.00	0.01	1.00	0.009	1.12	0.29	68.56		X	
Selenium	---	Ambient Hi	NA	0.004	NA	0.0001	0.64	0.00005	1.00	0.009	0.01	0.10	1.47	X		
Thallium	---	Ambient Hi	NA	0.004	NA	0.0001	2.20	0.0002	1.00	0.009	0.02	0.75	2.22	X		
Zinc	---	Ambient Hi	NA	0.004	NA	0.0001	264.00	0.02	1.00	0.009	2.46	11.79	817.63	X		
Total DDTs[c]	---	Ambient Hi	NA	0.004	NA	0.0001	7.00	0.001	1.00	0.009	0.07	1.85	36.98	X		
Arsenic	---	Ambient Lo	NA	0.003	NA	0.0001	27.00	0.002	1.00	0.016	0.11	0.75	8.32	X		
Copper	---	Ambient Lo	NA	0.003	NA	0.0001	81.00	0.01	1.00	0.016	0.32	3.41	769.32	X		
Lead	---	Ambient Lo	NA	0.003	NA	0.0001	95.00	0.01	1.00	0.016	0.37	0.003	273.42		X	
Manganese	---	Ambient Lo	NA	0.003	NA	0.0001	1500.00	0.09	1.00	0.016	5.85	18.24	203.93	X		
Mercury	---	Ambient Lo	NA	0.003	NA	0.0001	0.32	0.00002	1.00	0.016	0.001	0.51	9.94	X		
Nickel	---	Ambient Lo	NA	0.003	NA	0.0001	120.00	0.01	1.00	0.016	0.47	0.29	68.56		X	
Selenium	---	Ambient Lo	NA	0.003	NA	0.0001	0.64	0.00004	1.00	0.016	0.002	0.10	1.47	X		
Thallium	---	Ambient Lo	NA	0.003	NA	0.0001	2.20	0.0001	1.00	0.016	0.01	0.75	2.22	X		
Zinc	---	Ambient Lo	NA	0.003	NA	0.0001	264.00	0.02	1.00	0.016	1.03	11.79	817.63	X		
Total DDTs[c]	---	Ambient Lo	NA	0.003	NA	0.0001	7.00	0.0004	1.00	0.016	0.03	1.85	36.98	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th percent ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th percent ambient value
BW Body weight
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PAH Polynuclear aromatic hydrocarbon
PCB Polychlorinated biphenyl
[Pickleweed] Concentration of chemical in pickleweed
[Soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1
c Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
--- Not applicable to the analysis

TABLE T2-2

SALT MARSH HARVEST MOUSE HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sediment Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)
Arsenic	RADSBA07	0.489	0.204	0.746	8.320	0.025	0.656	0.059
Cobalt	RADSBH06	1.06	0.44	2.68	41.30	0.01	0.39	0.03
Copper	RADSBA07	1.21	0.50	3.41	769.32	0.001	0.35	0.002
Lead	RADSBG08	10.88	4.55	0.003	273.42	0.02	**3627.04**	0.04
	95UCL[a]	0.83	0.35	0.003	273.42	0.001	**277.30**	0.003
Manganese	RADSBI08	64.40	26.91	18.24	203.93	0.13	**3.53**	0.32
	95UCL[a]	11.02	4.61	18.24	203.93	0.02	0.60	0.05
Mercury	RADSBA04	0.01	0.004	0.51	9.94	0.0004	0.02	0.001
Nickel	RADSBH06	2.32	0.97	0.29	68.56	0.01	**8.04**	0.03
	95UCL[a]	0.76	0.32	0.29	68.56	0.005	**2.64**	0.01
Selenium	RADSBG08	0.09	0.04	0.10	1.47	0.02	0.85	0.06
Thallium	RADSBI08	0.17	0.07	0.75	2.22	0.03	0.23	0.08
Zinc	RADSBI07	10.35	4.33	11.79	817.63	0.01	0.88	0.01
Heptachlor	RADSBC05	0.00001	0.000002	0.23	14.04	0.0000001	0.00004	0.000001
Lindane	RADSBG04	0.00001	0.000003	0.10	4.54	0.000001	0.0001	0.000002
Total DDTs[b]	RADSBI11	0.001	0.0003	1.85	36.98	0.00001	0.0004	0.00002
Total PCBs	RADSBE03	0.01	0.002	0.42	1.53	0.001	0.01	0.003
Total PAHs	RADSBI13	0.06	0.03	1.68	42.10	0.001	0.04	0.001
Arsenic	Ambient[c]	0.25	0.11	0.75	8.32	0.01	0.34	0.03
Copper	Ambient[c]	0.76	0.32	3.41	769.32	0.0004	0.22	0.001
Lead	Ambient[c]	0.89	0.37	0.003	273.42	0.001	**295.56**	0.003
Manganese	Ambient[c]	14.00	5.85	18.24	203.93	0.03	0.77	0.07
Mercury	Ambient[c]	0.003	0.001	0.51	9.94	0.0001	0.01	0.0003
Nickel	Ambient[c]	1.12	0.47	0.29	68.56	0.01	**3.88**	0.02
Selenium	Ambient[c]	0.01	0.002	0.10	1.47	0.002	0.06	0.004
Thallium	Ambient[c]	0.02	0.01	0.75	2.22	0.004	0.03	0.01
Zinc	Ambient[c]	2.46	1.03	11.79	817.63	0.001	0.21	0.003
Total DDTs[b]	Ambient[c]	0.07	0.03	1.85	36.98	0.001	0.04	0.002

Notes: **Bold font indicates an HQ greater than 1**

DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
PAH Polynuclear aromatic hydrocarbon
TRV Toxicity reference value
PCB Polychlorinated biphenyl
UCL Upper confidence limit

a The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1
b Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
c The Tidal Area 99th percent ambient value

TABLE T2-3

GRAY FOX DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	RADSBJ04	High	217RAC2	0.21	0.34	0.07	42.00	0.01	0.40	1.00	2.95	0.16	0.17	1.93	X		
Cobalt	RADSBH06	High	217RAC2	0.08	0.34	0.03	108.00	0.01	1.03	1.00	2.95	0.36	0.62	9.56	X		
Copper	RADSBE07	High	217RAC3	2.60	0.34	0.89	87.80	0.01	0.84	1.00	2.95	0.59	0.79	178.90	X		
Lead	RADSBG08	High	217RAC2	1.20	0.34	0.41	1160.00	0.01	11.11	1.00	2.95	3.91	0.001	63.58		X	
	95UCL[b]	High	217RAC2	1.20	0.34	0.41	83.30	0.01	0.80	1.00	2.95	0.41	0.001	63.58		X	
Manganese	RADSBI08	High	217RAC2	2.20	0.34	0.75	6300.00	0.01	60.35	1.00	2.95	20.71	4.22	47.19		X	
	95UCL[b]	High	217RAC2	2.20	0.34	0.75	581.00	0.01	5.57	1.00	2.95	2.14	4.22	47.19	X		
Mercury	RADSB012	High	217RAC3	0.02	0.34	0.01	0.58	0.01	0.01	1.00	2.95	0.004	0.02	0.18	X		
Nickel	RADSBH06	High	217RAC3	0.87	0.34	0.30	242.00	0.01	2.32	1.00	2.95	0.89	0.07	15.94		X	
	95UCL[b]	High	217RAC3	0.87	0.34	0.30	74.70	0.01	0.72	1.00	2.95	0.34	0.07	15.94		X	
Selenium	RADSBG08	High	217RAC3	0.60	0.34	0.21	1.30	0.01	0.01	1.00	2.95	0.07	0.02	0.34		X	
	95UCL[b]	High	217RAC3	0.60	0.34	0.21	0.56	0.01	0.01	1.00	2.95	0.07	0.02	0.34		X	
Thallium	RADSBI08	High	1/2 DL[d]	0.20	0.34	0.07	5.40	0.01	0.05	1.00	2.95	0.04	0.17	0.52	X		
Zinc	RADSB017	High	217RAC2	41.90	0.34	14.33	959.00	0.01	9.19	1.00	2.95	7.97	2.74	190.13		X	
	95UCL[b]	High	217RAC2	41.90	0.34	14.33	140.00	0.01	1.34	1.00	2.95	5.31	2.74	190.13		X	
Heptachlor	RADSBC05	High	NA	NA	0.34	NA	0.30	0.01	0.003	1.00	2.95	0.001	0.05	3.27	X		
Lindane	RADSBG04	High	NA	NA	0.34	NA	0.30	0.01	0.003	1.00	2.95	0.001	0.06	1.05	X		
Total DDTs[c]	RADSB011	High	217RAC2	0.02	0.34	0.01	0.07	0.01	0.00	1.00	2.95	0.002	0.43	8.60	X		
Benzo(a)Pyrene	RADSB013	High	NA	NA	0.34	NA	1.50	0.01	0.01	1.00	2.95	0.005	0.39	9.79	X		
Naphthalene	RADSBG08	High	NA	NA	0.34	NA	0.30	0.01	0.003	1.00	2.95	0.001	25.90	77.26	X		
Total PCBs	RADSBE03	High	217RAC1	0.05	0.34	0.02	0.57	0.01	0.01	1.00	2.95	0.01	0.10	0.36	X		
Arsenic	RADSBJ04	Low	217RAC2	0.21	0.17	0.04	42.00	0.005	0.20	0.75	7.04	0.02	0.17	1.93	X		
Cobalt	RADSBH06	Low	217RAC2	0.08	0.17	0.01	108.00	0.005	0.51	0.75	7.04	0.06	0.62	9.56	X		
Copper	RADSBE07	Low	217RAC3	2.60	0.17	0.43	87.80	0.005	0.41	0.75	7.04	0.09	0.79	178.90	X		
Lead	RADSBG08	Low	217RAC2	1.20	0.17	0.20	1160.00	0.005	5.45	0.75	7.04	0.60	0.001	63.58		X	
	95UCL[b]	Low	217RAC2	1.20	0.17	0.20	83.30	0.005	0.39	0.75	7.04	0.06	0.001	63.58		X	
Manganese	RADSBI08	Low	217RAC2	2.20	0.17	0.37	6300.00	0.005	29.61	0.75	7.04	3.19	4.22	47.19	X		
	95UCL[b]	Low	217RAC2	2.20	0.17	0.37	581.00	0.005	2.73	0.75	7.04	0.33	4.22	47.19	X		
Mercury	RADSB012	Low	217RAC3	0.02	0.17	0.003	0.58	0.005	0.003	0.75	7.04	0.001	0.02	0.18	X		
Nickel	RADSBH06	Low	217RAC3	0.87	0.17	0.15	242.00	0.005	1.14	0.75	7.04	0.14	0.07	15.94		X	
	95UCL[b]	Low	217RAC3	0.87	0.17	0.15	74.70	0.005	0.35	0.75	7.04	0.05	0.07	15.94	X		
Selenium	RADSBG08	Low	217RAC3	0.60	0.17	0.10	1.30	0.005	0.01	0.75	7.04	0.01	0.02	0.34	X		
	95UCL[b]	Low	217RAC3	0.60	0.17	0.10	0.56	0.005	0.003	0.75	7.04	0.01	0.02	0.34	X		
Thallium	RADSBI08	Low	1/2 DL[d]	0.20	0.17	0.03	5.40	0.005	0.03	0.75	7.04	0.01	0.17	0.52	X		
Zinc	RADSB017	Low	217RAC2	41.90	0.17	7.00	959.00	0.005	4.51	0.75	7.04	1.23	2.74	190.13	X		
	95UCL[b]	Low	217RAC2	41.90	0.17	7.00	140.00	0.005	0.66	0.75	7.04	0.82	2.74	190.13	X		
Heptachlor	RADSBC05	Low	NA	NA	0.17	NA	0.0004	0.005	0.000002	0.75	7.04	0.0000002	0.05	3.27	X		
Lindane	RADSBG04	Low	NA	NA	0.17	NA	0.001	0.005	0.000004	0.75	7.04	0.0000004	0.06	1.05	X		
Total DDTs[c]	RADSB011	Low	217RAC2	0.02	0.17	0.003	0.07	0.005	0.00	0.75	7.04	0.0003	0.43	8.60	X		
Total PCBs	RADSBE03	Low	217RAC3	0.05	0.17	0.01	0.57	0.005	0.003	0.75	7.04	0.001	0.10	0.36	X		
Benzo(a)Pyrene	RADSB013	Low	NA	NA	0.17	NA	0.57	0.005	0.003	0.75	7.04	0.0003	0.39	9.79	X		
Naphthalene	RADSBG08	Low	NA	NA	0.17	NA	0.57	0.005	0.003	0.75	7.04	0.0003	25.90	77.26	X		

TABLE T2-3

GRAY FOX DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	RADSBA07	Typical	217RAC2	0.21	0.25	0.05	47.20	0.01	0.34	1.00	3.84	0.10	0.17	1.93	X		
	RADSBJ04	Typical	217RAC2	0.21	0.25	0.05	42.00	0.01	0.30	1.00	3.84	0.09	0.17	1.93	X		
Copper	RADSBA07	Typical	217RAC3	2.60	0.25	0.66	272.00	0.01	1.94	1.00	3.84	0.68	0.79	178.90	X		
	RADSBA03	Typical	217RAC3	2.60	0.25	0.66	98.00	0.01	0.70	1.00	3.84	0.35	0.79	178.90	X		
Lead	RADSBG08	Typical	217RAC2	1.20	0.25	0.31	1160.00	0.01	8.28	1.00	3.84	2.24	0.001	63.58		X	
	95UCL[b]	Typical	217RAC2	1.20	0.25	0.31	83.30	0.01	0.59	1.00	3.84	0.23	0.001	63.58		X	
Manganese	RADSBI08	Typical	217RAC2	2.20	0.25	0.56	6300.00	0.01	44.98	1.00	3.84	11.87	4.22	47.19		X	
Nickel	RADSBH06	Typical	217RAC3	0.87	0.25	0.22	242.00	0.01	1.73	1.00	3.84	0.51	0.07	15.94		X	
	RADSBF06	Typical	217RAC3	0.87	0.25	0.22	146.00	0.01	1.04	1.00	3.84	0.33	0.07	15.94		X	
	95UCL[b]	Typical	217RAC3	0.87	0.25	0.22	74.70	0.01	0.53	1.00	3.84	0.20	0.07	15.94		X	
Selenium	RADSBG08	Typical	217RAC3	0.60	0.25	0.15	2.80	0.01	0.02	1.00	3.84	0.05	0.02	0.34		X	
	95UCL[b]	Typical	217RAC3	0.60	0.25	0.15	0.56	0.01	0.004	1.00	3.84	0.04	0.02	0.34		X	
Zinc	RADSB017	Typical	217RAC2	41.90	0.25	10.66	959.00	0.01	6.85	1.00	3.84	4.56	2.74	190.13		X	
	95UCL[b]	Typical	217RAC2	41.90	0.25	10.66	140.00	0.01	1.00	1.00	3.84	3.04	2.74	190.13		X	
Arsenic	---	Ambient Hi	NA	NA	0.34	NA	27.00	0.01	0.26	1.00	2.95	0.09	0.17	1.93	X		
Copper	---	Ambient Hi	NA	NA	0.34	NA	81.00	0.01	0.78	1.00	2.95	0.26	0.79	178.90	X		
Lead	---	Ambient Hi	NA	NA	0.34	NA	95.00	0.01	0.91	1.00	2.95	0.31	0.001	63.58		X	
Manganese	---	Ambient Hi	NA	NA	0.34	NA	1500.00	0.01	14.37	1.00	2.95	4.87	4.22	47.19		X	
Mercury	---	Ambient Hi	NA	NA	0.34	NA	0.32	0.01	0.003	1.00	2.95	0.001	0.02	0.18	X		
Nickel	---	Ambient Hi	NA	NA	0.34	NA	120.00	0.01	1.15	1.00	2.95	0.39	0.07	15.94		X	
Selenium	---	Ambient Hi	NA	NA	0.34	NA	0.64	0.01	0.01	1.00	2.95	0.002	0.02	0.34	X		
Thallium	---	Ambient Hi	NA	NA	0.34	NA	2.20	0.01	0.02	1.00	2.95	0.01	0.17	0.52	X		
Zinc	---	Ambient Hi	NA	NA	0.34	NA	264.00	0.01	2.53	1.00	2.95	0.86	2.74	190.13	X		
Total DDTs[c]	---	Ambient Hi	NA	NA	0.34	NA	7.00	0.01	0.07	1.00	2.95	0.02	0.43	8.60	X		
Arsenic	---	Ambient Lo	NA	NA	0.17	NA	27.00	0.005	0.13	0.75	7.04	0.01	0.17	1.93	X		
Copper	---	Ambient Lo	NA	NA	0.17	NA	81.00	0.005	0.38	0.75	7.04	0.04	0.79	178.90	X		
Lead	---	Ambient Lo	NA	NA	0.17	NA	95.00	0.005	0.45	0.75	7.04	0.05	0.001	63.58		X	
Manganese	---	Ambient Lo	NA	NA	0.17	NA	1500.00	0.005	7.05	0.75	7.04	0.75	4.22	47.19	X		
Mercury	---	Ambient Lo	NA	NA	0.17	NA	0.32	0.005	0.002	0.75	7.04	0.0002	0.02	0.18	X		
Nickel	---	Ambient Lo	NA	NA	0.17	NA	120.00	0.005	0.56	0.75	7.04	0.06	0.07	15.94	X		
Selenium	---	Ambient Lo	NA	NA	0.17	NA	0.64	0.005	0.003	0.75	7.04	0.0003	0.02	0.34	X		
Thallium	---	Ambient Lo	NA	NA	0.17	NA	2.20	0.005	0.01	0.75	7.04	0.001	0.17	0.52	X		
Zinc	---	Ambient Lo	NA	NA	0.17	NA	264.00	0.005	1.24	0.75	7.04	0.13	2.74	190.13	X		
Total DDTs[c]	---	Ambient Lo	NA	NA	0.17	NA	7.00	0.005	0.03	0.75	7.04	0.004	0.43	8.60	X		
Arsenic	---	Amb Typical	NA	NA	0.25	NA	27.00	0.01	0.19	1.00	3.84	0.05	0.17	1.93	X		
Copper	---	Amb Typical	NA	NA	0.25	NA	81.00	0.01	0.58	1.00	3.84	0.15	0.79	178.90	X		
Lead	---	Amb Typical	NA	NA	0.25	NA	95.00	0.01	0.68	1.00	3.84	0.18	0.001	63.58		X	
Mercury	---	Amb Typical	NA	NA	0.25	NA	0.32	0.01	0.002	1.00	3.84	0.001	0.02	0.18	X		
Nickel	---	Amb Typical	NA	NA	0.25	NA	120.00	0.01	0.86	1.00	3.84	0.22	0.07	15.94		X	
Selenium	---	Amb Typical	NA	NA	0.25	NA	0.64	0.01	0.005	1.00	3.84	0.001	0.02	0.34	X		

TABLE T2-3

GRAY FOX DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Thallium	---	Amb Typical	NA	NA	0.25	NA	2.20	0.01	0.02	1.00	3.84	0.004	0.17	0.52	X		
Zinc	---	Amb Typical	NA	NA	0.25	NA	264.00	0.01	1.88	1.00	3.84	0.49	2.74	190.13	X		
Total DDTs[c]	---	Amb Typical	NA	NA	0.25	NA	7.00	0.01	0.05	1.00	3.84	0.01	0.43	8.60	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th ambient value
BW Body weight
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[prey] Concentration of chemical in prey
[soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b The dose for the 95 percent upper confidence limit was only calculated for chemicals with an HQ greater than 1
c Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
d Half the detection limit was used as the concentration when a chemical was below the detection limit
--- Not applicable to the analysis

TABLE T2-4

GRAY FOX HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	RADSBI04	0.16	0.02	0.10	0.17	1.93	0.01	0.93	0.08	0.59	0.05
Cobalt	RADSBH06	0.36	0.06	NA	0.62	9.56	0.01	0.58	0.04	NA	NA
Copper	RADSBE07	0.59	0.09	0.68	0.79	178.90	0.001	0.74	0.003	0.85	0.004
Lead	RADSBG08	3.91	0.60	2.24	0.001	63.58	0.01	**5580.24**	0.06	**3197.36**	0.04
	95 UCL[a]	0.41	0.06	0.23	0.001	63.58	0.001	**585.19**	0.01	**335.14**	0.004
Manganese	RADSBI08	20.71	3.19	11.87	4.22	47.19	0.07	**4.91**	0.44	**2.81**	0.25
	95 UCL[a]	2.14	0.33	NA	4.22	47.19	0.01	0.51	0.05	NA	NA
Mercury	RADSB012	0.004	0.001	NA	0.02	0.18	0.004	0.23	0.02	NA	NA
Nickel	RADSBH06	0.89	0.14	0.51	0.07	15.94	0.01	**13.24**	0.06	**7.58**	0.03
	95 UCL[a]	0.34	0.05	0.20	0.07	15.94	0.003	**5.13**	0.02	**2.94**	0.01
Selenium	RADSBG08	0.07	0.01	0.05	0.02	0.34	0.03	**3.14**	0.22	**1.92**	0.13
	95 UCL[a]	0.07	0.01	0.04	0.02	0.34	0.03	**3.04**	0.21	**1.74**	0.12
Thallium	RADSBI08	0.04	0.01	NA	0.17	0.52	0.01	0.24	0.08	NA	NA
Zinc	RADSB017	7.97	1.23	4.56	2.74	190.13	0.01	2.91	0.04	**1.67**	0.02
	95 UCL[a]	5.31	0.82	NA	2.74	190.13	0.004	**1.94**	0.03	NA	NA
Total DDTs[b]	RADSB011	0.002	0.0003	NA	0.43	8.60	0.00004	0.01	0.0003	NA	NA
Total PCBs	RADSBF03	0.01	0.001	NA	0.10	0.36	0.003	0.07	0.02	NA	NA
Benzo(a)pyrene	RADSB013	0.005	0.0003	NA	0.39	9.79	0.00003	0.01	0.0005	NA	NA
Naphthalene	RADSBG08	0.001	0.0003	NA	25.90	77.26	0.000004	0.00004	0.00001	NA	NA
Heptachlor	RADSBC05	0.001	0.0000002	NA	0.05	3.27	0.0000001	0.02	0.0003	NA	NA
Lindane	RADSBG04	0.001	0.0000004	NA	0.06	1.05	0.0000004	0.02	0.001	NA	NA
Arsenic	Ambient[c]	0.09	0.01	0.05	0.17	1.93	0.01	0.51	0.05	0.29	0.03
Copper	Ambient[c]	0.26	0.04	0.15	0.79	178.90	0.0002	0.33	0.001	0.19	0.001
Lead	Ambient[c]	0.31	0.05	0.18	0.00	63.58	0.001	**440.73**	0.005	**252.54**	0.003
Manganese	Ambient[c]	4.87	0.75	NA	4.22	47.19	0.02	**1.15**	0.10	NA	NA
Mercury	Ambient[c]	0.001	0.0002	0.001	0.02	0.18	0.001	0.06	0.01	NA	NA
Nickel	Ambient[c]	0.39	0.06	0.22	0.07	15.94	0.004	**5.82**	0.02	**3.33**	0.01
Selenium	Ambient[c]	0.002	0.0003	0.001	0.02	0.34	0.001	0.09	0.01	0.05	0.003
Thallium	Ambient[c]	0.01	0.001	0.004	0.17	0.52	0.002	0.04	0.01	NA	NA
Zinc	Ambient[c]	0.86	0.13	0.49	2.74	190.13	0.001	0.31	0.005	0.18	0.003
Total DDTs	Ambient[c]	0.02	0.004	0.01	0.43	8.60	0.0004	0.05	0.003	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

HQ Hazard quotient
DDT Dichlorodiphenyltrichloroethane
mg/kg/day Milligrams per kilogram per day
PCB Polychlorinated biphenyl
TRV Toxicity reference value
UCL Upper confidence limit

a The dose for the 95 percent upper confidence limit was only calculated for chemicals with an HQ greater than 1
b Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
c The Tidal Area 99th percent ambient value

TABLE T2-5

NORTHERN HARRIER DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	RADSBJ04	High	1/2 DL	0.21	0.04	0.01	42.00	0.0003	0.01	1	0.30	0.07	14.64	58.57	X		
Copper	RADSBE07	High	217RAC3	2.60	0.04	0.11	87.80	0.0003	0.03	1	0.30	0.45	3.34	48.52	X		
Lead	RADSBG08	High	217RAC2	1.20	0.04	0.05	1160.00	0.0003	0.34	1	0.30	1.30	0.003	15.89		X	
	95 UCL[b]	High	217RAC2	1.20	0.04	0.05	83.30	0.0003	0.02	1	0.30	0.25	0.003	15.89		X	
Manganese	RADSBI08	High	217RAC2	2.20	0.04	0.09	6300.00	0.0003	1.83	1	0.30	6.46	34.62	346.16	X		
Mercury	RADSB012	High	217RAC3	0.02	0.04	0.001	0.58	0.0003	0.0002	1	0.30	0.003	0.09	0.41	X		
Nickel	RADSBH06	High	217RAC3	0.87	0.04	0.04	242.00	0.0003	0.07	1	0.30	0.36	1.92	72.76	X		
Selenium	RADSBG08	High	217RAC3	0.60	0.04	0.02	3.50	0.0003	0.001	1	0.30	0.09	0.58	2.34	X		
Zinc	RADSB017	High	217RAC2	41.90	0.04	1.74	959.00	0.0003	0.28	1	0.30	6.77	37.29	372.89	X		
Total DDTs[c]	RADSB011	High	217RAC2	0.02	0.04	0.001	0.07	0.0003	0.00002	1	0.30	0.003	0.07	3.41	X		
Total PCBs	RADSBE03	High	217RAC1	0.05	0.04	0.002	0.57	0.0003	0.0002	1	0.30	0.01	0.16	4.95	X		
Arsenic	RADSBJ04	Low	1/2 DL	0.21	0.03	0.01	42.00	0.0002	0.01	0.75	0.60	0.02	14.64	58.57	X		
Copper	RADSBE07	Low	217RAC3	2.60	0.03	0.07	87.80	0.0002	0.02	0.75	0.60	0.11	3.34	48.52	X		
Lead	RADSBG08	Low	217RAC2	1.20	0.03	0.03	1160.00	0.0002	0.21	0.75	0.60	0.31	0.003	15.89		X	
	95 UCL[b]	Low	217RAC2	1.20	0.03	0.03	83.30	0.0002	0.02	0.75	0.60	0.06	0.003	15.89		X	
Manganese	RADSBI08	Low	217RAC2	2.20	0.03	0.06	6300.00	0.0002	1.17	0.75	0.60	1.54	34.62	346.16			
Mercury	RADSB012	Low	217RAC3	0.02	0.03	0.001	0.58	0.0002	0.0001	0.75	0.60	0.001	0.09	0.41	X		
Nickel	RADSBH06	Low	217RAC3	0.87	0.03	0.02	242.00	0.0002	0.04	0.75	0.60	0.09	1.92	72.76	X		
Selenium	RADSBG08	Low	217RAC3	0.60	0.03	0.02	3.50	0.0002	0.0006	0.75	0.60	0.02	0.58	2.34	X		
Zinc	RADSB017	Low	217RAC2	41.90	0.03	1.11	959.00	0.0002	0.18	0.75	0.60	1.62	37.29	372.89	X		
Total DDTs[c]	RADSB011	Low	217RAC2	0.02	0.03	0.0005	0.07	0.0002	0.00001	0.75	0.60	0.001	0.07	3.41	X		
Total PCBs	RADSBE03	Low	217RAC1	0.05	0.03	0.001	0.57	0.0002	0.0001	0.75	0.60	0.002	0.16	4.95	X		
Lead	RADSBG08	Typical	217RAC2	1.20	0.03	0.04	1160.00	0.0002	0.28	1	0.44	0.72	0.003	15.89		X	
	95 UCL[b]	Typical	217RAC2	1.20	0.03	0.04	83.30	0.0002	0.02	1	0.44	0.14	0.003	15.89		X	
Arsenic	---	Ambient Hi	NA	NA	0.04	NA	27.00	0.0003	0.01	1	0.30	0.03	14.64	58.57	X		
Copper	---	Ambient Hi	NA	NA	0.04	NA	81.00	0.0003	0.02	1	0.30	0.08	3.34	48.52	X		
Lead	---	Ambient Hi	NA	NA	0.04	NA	95.00	0.0003	0.03	1	0.30	0.09	0.003	15.89		X	
Mercury	---	Ambient Hi	NA	NA	0.04	NA	0.32	0.0003	0.0001	1	0.30	0.0003	0.09	0.41	X		
Nickel	---	Ambient Hi	NA	NA	0.04	NA	120.00	0.0003	0.03	1	0.30	0.12	1.92	72.76	X		
Selenium	---	Ambient Hi	NA	NA	0.04	NA	0.64	0.0003	0.0002	1	0.30	0.001	0.58	2.34	X		
Zinc	---	Ambient Hi	NA	NA	0.04	NA	264.00	0.0003	0.08	1	0.30	0.26	37.29	372.89	X		
Total DDTs[c]	---	Ambient Hi	NA	NA	0.04	NA	7.00	0.0003	0.002	1	0.30	0.01	0.07	3.41	X		
Arsenic	---	Ambient Lo	NA	NA	0.03	NA	27.00	0.0002	0.005	0.75	0.60	0.01	14.64	58.57	X		
Copper	---	Ambient Lo	NA	NA	0.03	NA	81.00	0.0002	0.01	0.75	0.60	0.02	3.34	48.52	X		
Lead	---	Ambient Lo	NA	NA	0.03	NA	95.00	0.0002	0.02	0.75	0.60	0.02	0.003	15.89		X	
Mercury	---	Ambient Lo	NA	NA	0.03	NA	0.32	0.0002	0.0001	0.75	0.60	0.0001	0.09	0.41	X		
Nickel	---	Ambient Lo	NA	NA	0.03	NA	120.00	0.0002	0.02	0.75	0.60	0.03	1.92	72.76	X		

TABLE T2-5

NORTHERN HARRIER DOSE CALCULATIONS IN THE R AREA TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Selenium	---	Ambient Lo	NA	NA	0.03	NA	0.64	0.0002	0.0001	0.75	0.60	0.0001	0.58	2.34	X		
Zinc	---	Ambient Lo	NA	NA	0.03	NA	264.00	0.0002	0.05	0.75	0.60	0.06	37.29	372.89	X		
Total DDTs[c]	---	Ambient Lo	NA	NA	0.03	NA	7.00	0.0002	0.001	0.75	0.60	0.002	0.07	3.41	X		
Lead	---	Amb Typical	NA	NA	0.03	NA	95.00	0.0002	0.02	1.00	0.44	0.05	0.003	15.89		X	

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th percent ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th percent ambient value
BW Body weight
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[prey] Concentration of chemical in prey
[soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
c The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1
--- Not applicable to the analysis

TABLE T2-6

NORTHERN HARRIER HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sediment Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	RADSBJ04	0.07	0.02	NA	14.64	58.57	0.0003	0.005	0.001	NA	NA
Copper	RADSBH07	0.45	0.11	NA	3.34	48.52	0.002	0.13	0.01	NA	NA
Lead	RADSBG08	1.30	0.31	0.72	0.003	15.89	0.02	**433.29**	0.08	**239.52**	0.05
	95UCL[a]	0.25	0.06	0.14	0.003	15.89	0.004	**82.82**	0.02	**45.82**	0.01
Manganese	RADSBI08	6.46	1.54	NA	34.62	346.16	0.004	0.19	0.02	NA	NA
Mercury	RADSB012	0.003	0.001	NA	0.09	0.41	0.002	0.04	0.01	NA	NA
Nickel	RADSBH06	0.36	0.09	NA	1.92	72.76	0.001	0.19	0.005	NA	NA
Selenium	RADSBG08	0.09	0.02	NA	0.58	2.34	0.009	0.15	0.04	NA	NA
Zinc	RADSB017	6.77	1.62	NA	37.29	372.89	0.004	0.18	0.02	NA	NA
Total DDTs[b]	RADSB011	0.003	0.001	NA	0.07	3.41	0.0002	0.04	0.001	NA	NA
Total PCBs	RADSBE03	0.01	0.002	NA	0.16	4.95	0.0003	0.04	0.001	NA	NA
Arsenic	Ambient[c]	0.03	0.01	NA	14.64	58.57	0.0001	0.002	0.000	NA	NA
Copper	Ambient[c]	0.08	0.02	NA	3.34	48.52	0.0004	0.02	0.002	NA	NA
Lead	Ambient[c]	0.09	0.02	0.05	0.003	15.89	0.001	**30.92**	0.01	**17.09**	0.003
Mercury	Ambient[c]	0.0003	0.0001	NA	0.09	0.41	0.0002	0.004	0.001	NA	NA
Nickel	Ambient[c]	0.12	0.03	NA	1.92	72.76	0.0004	0.06	0.002	NA	NA
Selenium	Ambient[c]	0.001	0.0001	NA	0.58	2.34	0.0001	0.001	0.0003	NA	NA
Zinc	Ambient[c]	0.26	0.06	NA	37.29	372.89	0.0002	0.01	0.001	NA	NA
Total DDTs[b]	Ambient[c]	0.01	0.002	NA	0.07	3.41	0.0005	0.10	0.002	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
TRV Toxicity reference value
UCL Upper confidence limit

a The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1
b Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
c The Tidal Area 99th percent ambient value

ATTACHMENT T3

FOOD-CHAIN MODELING CALCULATIONS FOR THE R AREA TERRESTRIAL AND AQUATIC UNIT

LIST OF TABLES

Table

T3-1 GREAT BLUE HERON DOSE CALCULATIONS IN THE R AREA TERRESTRIAL AND AQUATIC UNIT

T3-2 GREAT BLUE HERON HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL AND AQUATIC UNIT

T3-3 BLACK-NECKED STILT DOSE CALCULATIONS IN THE R AREA TERRESTRIAL AND AQUATIC UNIT

T3-4 BLACK-NECKED STILT HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL AND AQUATIC UNIT

TABLE T3-1

GREAT BLUE HERON DOSE CALCULATIONS IN THE R AREA TERRESTRIAL AND AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 3.3%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose[b] (mg/kg day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Zinc	RADSB013	High	0.11	26.40	0.11	2.77	424.00	0.003	1.47	1.00	2.09	2.03	6.87	68.73	X		
Zinc	RADSB013	Low	0.09	26.40	0.09	2.48	424.00	0.003	1.32	0.75	2.48	1.15	6.87	68.73	X		
Zinc	Ambient Hi	High	0.11	NA	0.11	NA	158.00	0.003	0.55	1.00	2.09	0.26	6.87	68.73	X		
Zinc	Ambient Lo	Low	0.09	NA	0.09	NA	158.00	0.003	0.49	0.75	2.48	0.15	6.87	68.73	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th ambient value
BW Body weight
[fish] Concentration of chemical in fish
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value

a Chemicals were selected based on available TRV information

TABLE T3-2

GREAT BLUE HERON HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL AND AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)
Zinc	RADSB013	2.03	1.15	6.87	68.73	0.02	0.30	0.03
Zinc	Ambient[a]	0.26	0.15	6.87	68.73	0.002	0.04	0.004

Notes:

HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
TRV Toxicity reference value

a The Tidal Area 99th percent ambient value

TABLE T3-3

BLACK-NECKED STILT DOSE CALCULATIONS IN THE R AREA TERRESTRIAL AND AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[amphipod] (mg/kg)	$IR_{amphipod}$ (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 17%	Ingestion from Sediment	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Zinc	RADSB013	High	0.02	11.00	0.02	0.23	424.00	0.004	1.51	1.00	0.12	14.07	98.95	989.52	X		
Zinc	RADSB013	Low	0.02	11.00	0.02	0.17	436.00	0.003	1.11	1.00	0.21	6.14	98.95	989.52	X		
Zinc	---	Ambient Hi	0.02	NA	0.02	NA	158.00	0.004	0.56	1.00	0.12	4.55	98.95	989.52	X		
Zinc	---	Ambient Lo	0.02	NA	0.02	NA	158.00	0.003	0.40	1.00	0.21	1.94	98.95	989.52	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th percent ambient value
[amphipod] Concentration of chemical in amphipod
BW Body weight
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of sediment
kg/day Kilograms per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value

a Chemicals were selected based on available TRV information
--- Not applicable to the analysis

TABLE T3-4

BLACK-NECKED STILT HAZARD QUOTIENT CALCULATIONS IN THE R AREA TERRESTRIAL AND AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)
Zinc	RADSB013	14.07	6.14	98.95	989.52	0.01	0.14	0.01
Zinc	Ambient[a]	4.55	1.94	98.95	989.52	0.002	0.05	0.005

Notes:

HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
TRV Toxicity reference value

a The Tidal Area 99th percent ambient value

ATTACHMENT T4

FOOD-CHAIN MODELING CALCULATIONS FOR THE FROID AND TAYLOR TERRESTRIAL UNIT

LIST OF TABLES

Table

T4-1 SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT

T4-2 GRAY FOX DOSE CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT

T1-3 GRAY FOX HAZARD QUOTIENT CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT

T4-4 NORTHERN HARRIER DOSE CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT

T4-5 NORTHERN HARRIER HAZARD QUOTIENT CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT

TABLE T4-1

SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	[Pickleweed] (mg/kg)	IR_{prey} (kg/d)	Ingestion from Prey (mg/d)	IR_{soil} (kg/d)	[Soil] (mg/kg)	Ingestion from Soil (mg/d)	SUF	BW (kg)	Dose[b] (mg/kg/day)	Low TRV	High TRV	Below Low TRV[c]	Between Low and High TRVs	Above High TRV
Total Chlordanes	FTSSB001	High	NA	0.004	NA	0.0001	0.19	0.00002	1.00	0.01	0.002	0.23	10.15	X		
Total DDTs[d]	FTSSB001	High	NA	0.004	NA	0.0001	0.04	0.000003	1.00	0.01	3.808E-04	1.85	36.98	X		
Total PCBs	FTSSB002	High	NA	0.004	NA	0.0001	2.94	0.0002	1.00	0.01	0.027	0.42	1.53	X		

Notes:

BW Body weight
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
PAH Polynuclear aromatic hydrocarbon
PCB Polychlorinated biphenyl
[Pickleweed] Concentration of chemical in pickleweed
[Soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value

a Chemicals were selected based on available TRV information
b Point doses were calculated for each sample location
c Since all doses were below the low TRV, no HQs were calculated
d Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT

TABLE T4-2

GRAY FOX DOSE CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose[b] (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Total Chlordan	FTSSB001	High	RAC2	0.002	0.34	0.001	0.06	0.01	0.001	0.75	2.95	0.0003	0.05	2.36	X		
Total DDTs[c]	FTSSB001	High	RAC2	0.02	0.34	0.01	0.04	0.01	0.000	0.75	2.95	0.002	0.43	8.60	X		
Total PCBs	FTSSB001	High	NA	NA	NA	NA	2.94	0.01	0.03	0.75	2.95	0.01	0.10	0.36	X		
Total Chlordan	FTSSB001	Low	RAC2	0.002	0.17	0.0003	0.19	0.005	0.001	0.50	7.04	0.0001	0.05	2.36	X		
Total DDTs[c]	FTSSB001	Low	RAC2	0.02	0.17	0.003	0.04	0.005	0.000	0.50	7.04	0.0002	0.43	8.60	X		

Notes:

BW Body weight
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[prey] Concentration of chemical in prey
[soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value

a Chemicals were selected based on available TRV information
b Point doses were calculated for the one sample location
c Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT

TABLE T4-3

GRAY FOX HAZARD QUOTIENT CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sediment Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)
Total DDTs[a]	FTSSB001	0.002	0.0002	0.43	8.60	0.00003	0.004	0.0002
Chlordanes	FTSSB001	0.0003	0.00004	0.05	2.36	0.00002	0.01	0.0001

Notes:

DDT Dichlorodiphenyltrichloroethane

HQ Hazard quotient

mg/kg/day Milligrams per kilogram per day

TRV Toxicity reference value

a Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT

TABLE T4-4

NORTHERN HARRIER DOSE CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
DDE	FTSSB001	High	RAC2	0.01	0.04	0.0005	0.02	0.0003	0.000005	0.75	0.30	0.001	NA	1.36	X		
Total DDTs[b]	FTSSB001	High	RAC2	0.02	0.04	0.001	0.04	0.0003	0.00001	0.75	0.30	0.002	0.07	3.41	X		
DDE	FTSSB001	Low	RAC2	0.01	0.03	0.0003	0.02	0.0003	0.000005	0.50	0.60	0.0002	NA	1.36	X		
Total DDTs[b]	FTSSB001	Low	RAC2	0.02	0.03	0.0005	0.04	0.0003	0.00001	0.50	0.60	0.0004	0.07	3.41	X		

Notes:

BW Body weight
DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[prey] Concentration of chemical in prey
[soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value

a Chemicals were selected based on available TRV information
b Total DDTs are the sum of dichlorodiphenyldichloroethane, DDE, and DDT

TABLE T4-5
NORTHERN HARRIER HAZARD QUOTIENT CALCULATIONS IN THE FROID AND TAYLOR TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)
DDTs	FTSSB001	0.002	0.0004	0.07	3.41	0.0001	0.03	0.0005
DDE	FTSSB001	0.001	0.0002	NA	1.36	0.0002	NA	0.001

Notes: **Bold font indicates an HQ greater than 1**

DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
NA Not available
TRV Toxicity reference value

a Total DDTs are the sum of dichlorodiphenyldichloroethane, DDE, and DDT

ATTACHMENT T5

FOOD-CHAIN MODELING CALCULATIONS FOR THE FROID AND TAYLOR AQUATIC UNIT

LIST OF TABLES

Table

T5-1 GREAT BLUE HERON DOSE CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT

T5-2 GREAT BLUE HERON HAZARD QUOTIENT CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT

T5-3 BLACK-NECKED STILT DOSE CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT

T5-4 BLACK-NECKED STILT HAZARD QUOTIENT CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT

TABLE T5-1

GREAT BLUE HERON DOSE CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 3.3%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose (mg/kg day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Copper	102	High	0.11	1.50	0.11	0.16	92.00	0.003	0.32	1.00	2.09	0.23	0.62	8.94	X		
Lead	2	High	0.11	0.22	0.11	0.02	515.00	0.003	1.78	1.00	2.09	0.86	0.0005	2.93		X	
Mercury	6	High	0.11	0.09	0.11	0.01	0.49	0.003	0.002	1.00	2.09	0.01	0.02	0.08	X		
Selenium	104	High	0.11	0.45	0.11	0.05	1.50	0.003	0.01	1.00	2.09	0.03	0.11	0.43	X		
Zinc	2	High	0.11	21.20	0.11	2.23	436.00	0.003	1.51	1.00	2.09	1.79	6.87	68.73	X		
DDE[b,c]	102	High	0.11	0.01	0.11	0.001	0.01	0.003	0.00002	1.00	2.09	0.0003	0.01	0.25	X		
DDT[b,c]	102	High	0.11	0.0004	0.11	0.00004	0.02	0.003	0.0001	1.00	2.09	0.00004	0.01	0.63	X		
Total DDTs[b,c]	102	High	0.11	0.03	0.11	0.003	0.04	0.003	0.0001	1.00	2.09	0.001	0.01	NA	X		
Copper	102	Low	0.09	1.50	0.09	0.14	92.00	0.003	0.29	0.75	2.48	0.13	0.62	8.94	X		
Lead	2	Low	0.09	0.22	0.09	0.02	515.00	0.003	1.60	0.75	2.48	0.49	0.0005	2.93		X	
Mercury	6	Low	0.09	0.09	0.09	0.01	0.49	0.003	0.002	0.75	2.48	0.003	0.02	0.08	X		
Selenium	104	Low	0.09	0.45	0.09	0.04	1.50	0.003	0.005	0.75	2.48	0.01	0.11	0.43	X		
Zinc	2	Low	0.09	21.20	0.09	1.99	436.00	0.003	1.35	0.75	2.48	1.01	6.87	68.73	X		
DDE[b,c]	102	Low	0.09	0.01	0.09	0.001	0.01	0.003	0.00002	0.75	2.48	0.0002	0.01	0.25	X		
DDT[b,c]	102	Low	0.09	0.0004	0.09	0.00004	0.02	0.003	0.00005	0.75	2.48	0.00003	0.01	0.63	X		
Total DDTs[b,c]	102	Low	0.09	0.03	0.09	0.002	0.04	0.003	0.0001	0.75	2.48	0.001	0.01	NA	X		
Lead	2	Typical	0.10	0.22	0.10	0.02	515.00	0.003	1.69	1.00	2.39	0.72	0.0005	2.93		X	
Copper	---	Ambient Hi	0.11	NA	0.11	NA	68.10	0.003	0.24	1.00	2.09	0.11	0.62	8.94	X		
	---	Ambient Lo	0.09	NA	0.09	NA	68.10	0.003	0.21	0.75	2.48	0.06	0.62	8.94	X		
Lead	---	Ambient Hi	0.11	NA	0.11	NA	43.20	0.003	0.15	1.00	2.09	0.07	0.0005	2.93		X	
Mercury	---	Ambient Hi	0.11	NA	0.11	NA	0.43	0.003	0.001	1.00	2.09	0.001	0.02	0.08	X		
Selenium	---	Ambient Hi	0.11	NA	0.11	NA	0.64	0.003	0.002	1.00	2.09	0.001	0.11	0.43	X		
	---	Ambient Lo	0.09	NA	0.09	NA	0.64	0.003	0.002	0.75	2.48	0.001	0.11	0.43	X		
Zinc	---	Ambient Hi	0.11	NA	0.11	NA	158.00	0.003	0.55	1.00	2.09	0.26	6.87	68.73	X		
DDE[b,c]	---	Ambient Hi	0.11	NA	0.11	NA	0.01	0.003	0.00002	1.00	2.09	0.00001	0.01	0.25	X		
DDT[b,c]	---	Ambient Hi	0.11	NA	0.11	NA	0.02	0.003	0.0001	1.00	2.09	0.00002	0.01	0.63	X		
Total DDTs[b,c]	---	Ambient Hi	0.11	NA	0.11	NA	0.04	0.003	0.0001	1.00	2.09	0.0001	0.01	NA	X		
Lead	---	Ambient Lo	0.09	NA	0.09	NA	43.20	0.003	0.13	0.75	2.48	0.04	0.0005	2.93		X	
	---	Amb Typical	0.10	NA	0.10	NA	43.20	0.003	0.14	1.00	2.39	0.06	0.0005	2.93		X	
Mercury	---	Ambient Lo	0.09	NA	0.09	NA	0.43	0.003	0.001	0.75	2.48	0.0004	0.02	0.08	X		
Zinc	---	Ambient Lo	0.09	NA	0.09	NA	158.00	0.003	0.49	0.75	2.48	0.15	6.87	68.73	X		

TABLE T5-1

GREAT BLUE HERON DOSE CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 3.3%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose (mg/kg day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
DDE[b,c]	---	Ambient Lo	0.09	NA	0.09	NA	0.01	0.003	0.00002	0.75	2.48	0.00001	0.01	0.25	X		
DDT[b,c]	---	Ambient Lo	0.09	NA	0.09	NA	0.02	0.003	0.00005	0.75	2.48	0.00001	0.01	0.63	X		
Total DDTs[b,c]	---	Ambient Lo	0.09	NA	0.09	NA	0.04	0.003	0.0001	0.75	2.48	0.00004	0.01	NA	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th ambient value

Ambient Lo The low dose calculation using the Tidal Area 99th ambient value

Amb Typical The typical dose calculation using the Tidal Area 99th ambient value

BW Body weight

DDE Dichlorodiphenyldichloroethene

DDT Dichlorodiphenyltrichloroethane

[fish] Concentration of chemical in fish

IR_{prey} Ingestion rate of prey

$IR_{sediment}$ Ingestion rate of soil

kg/day Kilograms per day

mg/d Milligrams per day

mg/kg Milligrams per kilogram

mg/kg/day Milligrams per kilogram per day

NA Not available

[sediment] Concentration of chemical in sediment

SUF Site use factor

TRV Toxicity reference value

UCL Upper confidence limit

a Chemicals were selected based on available TRV information

b Low TRV for DDTs based on total DDTs, while high TRVs based on DDE or DDT

c Total DDTs are the sum of dichlorodiphenyldichloroethane, DDE, and DDT

d The dose for the 95 percent upper confidence limit was only calculated for chemicals with an HQ greater than 1

--- Not applicable to the analysis

TABLE T5-2

GREAT BLUE HERON HAZARD QUOTIENT CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Copper	102	0.23	0.13	NA	0.62	8.94	0.01	0.37	0.03	NA	NA
Lead	2	0.86	0.49	0.72	0.0005	2.93	0.17	**1765.04**	0.30	**1462.64**	0.24
Mercury	6	0.01	0.003	NA	0.02	0.08	0.04	0.33	0.07	NA	NA
Selenium	104	0.03	0.01	NA	0.11	0.43	0.03	0.24	0.06	NA	NA
Zinc	2	1.79	1.01	NA	6.87	68.73	0.01	0.26	0.03	NA	NA
DDE[a,b]	102	0.0003	0.0002	NA	0.01	0.25	0.001	0.02	0.001	NA	NA
DDT[a,b]	102	0.00005	0.00003	NA	0.01	0.63	0.00004	0.004	0.00008	NA	NA
Total DDTs[a,b]	102	0.001	0.001	NA	0.01	NA	NA	0.10	NA	NA	NA
Copper	Ambient[c]	0.11	0.06	NA	0.62	8.94	0.01	0.18	0.01	NA	NA
Lead	Ambient[c]	0.07	0.04	0.06	0.0005	2.93	0.01	**146.17**	0.02	**121.12**	0.02
Mercury	Ambient[c]	0.0007	0.0004	NA	0.02	0.08	0.01	0.04	0.01	NA	NA
Selenium	Ambient[c]	0.001	0.001	NA	0.11	0.43	0.001	0.01	0.002	NA	NA
Zinc	Ambient[c]	0.26	0.15	NA	6.87	68.73	0.002	0.04	0.004	NA	NA
DDE[a,b]	Ambient[c]	0.00001	0.00001	NA	0.01	0.25	0.00003	0.0009	0.00005	NA	NA
DDT[a,b]	Ambient[c]	0.00002	0.00001	NA	0.01	0.63	0.00002	0.002	0.00004	NA	NA
Total DDTs[a,b]	Ambient[c]	0.0001	0.00004	NA	0.01	NA	NA	0.01	NA	NA	NA

Notes: **Bold font indicates an HQ greater than 1**
Area dose calculated for highest point concentration

DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
Ambient Tidal Area 99th ambient value
TRV Toxicity reference value

a Low TRV for DDTs based on total DDTs, while high TRV based on DDE or DDT
b Total DDTs are the sum of DDD, DDE, and DDT
c The Tidal Area 99th percent ambient value

TABLE T5-3

BLACK-NECKED STILT DOSE CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[amphipod] (mg/kg)	$IR_{amphipod}$ (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 17%	Ingestion from Sediment	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Copper	FTSSL102	High	0.02	5.10	0.02	0.11	92.00	0.004	0.33	1.00	0.12	3.51	8.85	128.76	X		
Lead	FTSSL102	High	0.02	1.90	0.02	0.04	515.00	0.004	1.84	1.00	0.12	15.15	0.01	42.17		X	
	FTSSB003	High	0.02	1.90	0.02	0.04	211.00	0.004	0.75	1.00	0.12	6.40	0.01	42.17		X	
	95 UCL[b]	High	0.02	1.90	0.02	0.04	240.00	0.004	0.86	1.00	0.12	7.23	0.01	42.17		X	
Mercury	FTSSB006	High	0.02	0.03	0.02	0.00	0.49	0.004	0.002	1.00	0.12	0.02	0.24	1.08	X		
Selenium	FTSSL104	High	0.02	0.28	0.02	0.01	1.50	0.004	0.01	1.00	0.12	0.09	1.53	6.21	X		
Zinc	FTSSL102	High	0.02	11.00	0.02	0.23	436.00	0.004	1.56	1.00	0.12	14.42	98.95	989.52	X		
DDE	FTSSL102	High	0.02	0.003	0.02	0.0001	0.01	0.004	0.00002	1.00	0.12	0.001	NA	3.61	X		
DDT	FTSSL102	High	0.02	0.0004	0.02	0.00001	0.02	0.004	0.0001	1.00	0.12	0.0005	0.19	9.04	X		
Total DDTs[c]	FTSSL102	High	0.02	0.01	0.02	0.0002	0.04	0.004	0.0002	1.00	0.12	0.003	0.19	9.04	X		
Copper	FTSSL102	Low	0.02	5.10	0.02	0.08	92.00	0.003	0.23	1.00	0.21	1.50	8.85	128.76	X		
Lead	FTSSL102	Low	0.02	1.90	0.02	0.03	515.00	0.003	1.31	1.00	0.21	6.45	0.01	42.17		X	
	FTSSB003	Low	0.02	1.90	0.02	0.03	211.00	0.003	0.54	1.00	0.21	2.72	0.01	42.17		X	
	95 UCL[b]	Low	0.02	1.90	0.02	0.03	240.00	0.003	0.61	1.00	0.21	3.08	0.01	42.17		X	
Mercury	FTSSB006	Low	0.02	0.03	0.02	0.0005	0.49	0.003	0.001	1.00	0.21	0.01	0.24	1.08	X		
Selenium	FTSSL104	Low	0.02	0.28	0.02	0.004	1.50	0.003	0.004	1.00	0.21	0.04	1.53	6.21	X		
Zinc	FTSSL102	Low	0.02	11.00	0.02	0.17	436.00	0.003	1.11	1.00	0.21	6.14	98.95	989.52	X		
DDE	FTSSL102	Low	0.02	0.003	0.02	0.00004	0.01	0.003	0.00002	1.00	0.21	0.0003	NA	3.61	X		
DDT	FTSSL102	Low	0.02	0.0004	0.02	0.00001	0.02	0.003	0.00004	1.00	0.21	0.0002	0.19	9.04	X		
Total DDTs[c]	FTSSL102	Low	0.02	0.01	0.02	0.0002	0.04	0.003	0.0001	1.00	0.21	0.001	0.19	9.04	X		
Lead	FTSSL102	Typical	0.02	1.90	0.02	0.03	515.00	0.003	1.58	1.00	0.17	9.70	0.01	42.17		X	
	95 UCL[b]	Typical	0.02	1.90	0.02	0.03	240.00	0.003	0.73	1.00	0.17	4.63	0.01	42.17		X	
Copper	---	Ambient Hi	0.02	NA	0.02	NA	68.10	0.004	0.24	1.00	0.12	1.96	8.85	128.76	X		
Lead	---	Ambient Hi	0.02	NA	0.02	NA	43.20	0.004	0.15	1.00	0.12	1.24	0.01	42.17		X	
Mercury	---	Ambient Hi	0.02	NA	0.02	NA	0.43	0.004	0.002	1.00	0.12	0.01	0.24	1.08	X		
Selenium	---	Ambient Hi	0.02	NA	0.02	NA	0.64	0.004	0.002	1.00	0.12	0.02	1.53	6.21	X		
Zinc	---	Ambient Hi	0.02	NA	0.02	NA	158.00	0.004	0.56	1.00	0.12	4.55	98.95	989.52	X		
DDE	---	Ambient Hi	0.02	NA	0.02	NA	0.01	0.004	0.00002	1.00	0.12	0.0002	NA	3.61	X		
DDT	---	Ambient Hi	0.02	NA	0.02	NA	0.02	0.004	0.00005	1.00	0.12	0.0004	0.19	9.04	X		
Total DDTs[c]	---	Ambient Hi	0.02	NA	0.02	NA	0.01	0.004	0.00002	1.00	0.12	0.0002	0.19	9.04	X		
Copper	---	Ambient Lo	0.02	NA	0.02	NA	68.10	0.003	0.17	1.00	0.21	0.83	8.85	128.76	X		
Lead	---	Ambient Lo	0.02	NA	0.02	NA	43.20	0.003	0.11	1.00	0.21	0.53	0.01	42.17		X	
Mercury	---	Ambient Lo	0.02	NA	0.02	NA	0.43	0.003	0.001	1.00	0.21	0.01	0.24	1.08	X		
Selenium	---	Ambient Lo	0.02	NA	0.02	NA	0.64	0.003	0.002	1.00	0.21	0.01	1.53	6.21	X		

TABLE T5-3

BLACK-NECKED STILT DOSE CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[amphipod] (mg/kg)	$IR_{amphipod}$ (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 17%	Ingestion from Sediment	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Zinc	---	Ambient Lo	0.02	NA	0.02	NA	158.00	0.003	0.40	1.00	0.21	1.94	98.95	989.52	X		
DDE	---	Ambient Lo	0.02	NA	0.02	NA	0.01	0.003	0.00002	1.00	0.21	0.0001	NA	3.61	X		
DDT	---	Ambient Lo	0.02	NA	0.02	NA	0.02	0.003	0.00004	1.00	0.21	0.0002	0.19	9.04	X		
Total DDTs[c]	---	Ambient Lo	0.02	NA	0.02	NA	0.01	0.003	0.00002	1.00	0.21	0.0001	0.19	9.04	X		
Lead	---	Amb Typical	0.02	NA	0.02	NA	43.20	0.003	0.13	1.00	0.17	0.80	0.01	42.17		X	

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th percent ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th percent ambient value
[amphipod] Concentration of chemical in amphipod
BW Body weight
DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of sediment
kg/day Kilograms per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b The dose for the 95 percent upper confidence limit was only calculated for chemicals with an HQ greater than 1
c Total DDTs are the sum of dichlorodiphenyldichloroethane, DDE, and DDT
--- Not applicable to the analysis

TABLE T5-4

BLACK-NECKED STILT HAZARD QUOTIENT CALCULATIONS IN THE FROID AND TAYLOR AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Copper	FTSSL102	3.51	1.50	NA	8.85	128.76	0.01	0.40	0.03	NA	NA
Lead	FTSSL102	15.15	6.45	9.70	0.01	42.17	0.15	**2133.63**	0.36	**1366.11**	0.23
	FTSSB003	6.40	2.72	NA	0.01	42.17	0.06	**900.92**	0.15	NA	NA
	95 UCL[a]	7.23	3.08	4.63	0.01	42.17	0.07	**1018.51**	0.17	**652.13**	0.11
Mercury	FTSSB006	0.02	0.01	NA	0.24	1.08	0.01	0.08	0.02	NA	NA
Selenium	FTSSL104	0.09	0.04	NA	1.53	6.21	0.01	0.06	0.01	NA	NA
Zinc	FTSSL102	14.42	6.14	NA	98.95	989.52	0.01	0.15	0.01	NA	NA
DDE	FTSSL102	0.001	0.0003	NA	NA	3.61	0.0001	NA	0.0002	NA	NA
DDTs	FTSSL102	0.003	0.001	NA	0.19	9.04	0.0001	0.02	0.0003	NA	NA
Total DDTs[b]	FTSSL102	0.0005	0.0002	NA	0.19	9.04	0.00002	0.003	0.0001	NA	NA
Copper	Ambient[c]	1.96	0.83	NA	8.85	128.76	0.01	0.22	0.02	NA	NA
Lead	Ambient[c]	1.24	0.53	0.80	0.01	42.17	0.01	**175.17**	0.03	**112.16**	0.02
Mercury	Ambient[c]	0.01	0.01	NA	0.24	1.08	0.005	0.05	0.01	NA	NA
Selenium	Ambient[c]	0.02	0.01	NA	1.53	6.21	0.001	0.01	0.003	NA	NA
Zinc	Ambient[c]	4.55	1.94	NA	98.95	989.52	0.002	0.05	0.005	NA	NA
DDE	Ambient[c]	0.0002	0.0001	NA	NA	3.61	0.00002	NA	0.0001	NA	NA
DDT	Ambient[c]	0.0004	0.0002	NA	0.19	9.04	0.00002	0.002	0.00005	NA	NA
Total DDTs[b]	Ambient[c]	0.0002	0.0001	NA	0.19	9.04	0.00001	0.001	0.00002	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
TRV Toxicity reference value
UCL Upper confidence limit

a The dose for the 95 percent upper cofidence limit was only calculated for chemicals with an HQ greater than 1
b Total DDTs are the sum of dichlorodiphenyldichloroethane, DDE, and DDT
c The Tidal Area 99th percent ambient value

ATTACHMENT T6

FOOD-CHAIN MODELING CALCULATIONS FOR THE WOOD HOGGER TERRESTRIAL UNIT

LIST OF TABLES

Table

T6-1 SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-2 SALT MARSH HARVEST MOUSE HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-3 SALT MARSH HARVEST MOUSE DIOXIN CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-4 SALT MARSH HARVEST MOUSE DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-5 GRAY FOX DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-6 GRAY FOX HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-7 GRAY FOX DIOXIN DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-8 GRAY FOX DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-9 NORTHERN HARRIER DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-10 NORTHERN HARRIER HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-11 NORTHERN HARRIER DIOXIN DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

T6-12 NORTHERN HARRIER DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT

TABLE T6-1

SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	[Pickleweed] (mg/kg)	IR_{prey} (kg/d)	Ingestion from Prey (mg/d)	IR_{soil} (kg/d)	[Soil] (mg/kg)	Ingestion from Soil (mg/d)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	WHSSBK06	High	0.24	0.004	0.001	0.0001	27.10	0.002	1.00	0.01	0.35	0.75	8.32	X		
Cadmium	WHSSBI02	High	0.02	0.004	0.0001	0.0001	20.80	0.002	1.00	0.01	0.20	0.08	3.41		X	
	95UCL[b]	High	0.02	0.004	0.0001	0.0001	2.50	0.0002	1.00	0.01	0.03	0.08	3.41	X		
Copper	WHSSBH03	High	0.54	0.004	0.002	0.0001	607.00	0.05	1.00	0.01	5.88	3.41	769.32		X	
	95UCL[b]	High	0.54	0.004	0.002	0.0001	62.00	0.01	1.00	0.01	0.79	3.41	769.32	X		
Lead	WHSSBF03	High	0.14	0.004	0.0005	0.0001	598.00	0.05	1.00	0.01	5.64	0.003	273.42		X	
	95UCL[b]	High	0.14	0.004	0.0005	0.0001	101.00	0.01	1.00	0.01	1.00	0.003	273.42		X	
Mercury	WHSSB024	High	0.01	0.004	0.00004	0.0001	7.10	0.001	1.00	0.01	0.07	0.51	9.94	X		
Selenium	WHSSBC02	High	0.18	0.004	0.001	0.0001	4.80	0.0004	1.00	0.01	0.11	0.10	1.47		X	
	95UCL[b]	High	0.18	0.004	0.001	0.0001	0.64	0.00005	1.00	0.01	0.08	0.10	1.47	X		
Thallium	WHSSBD03	High	0.31	0.004	0.001	0.0001	2.40	0.0002	1.00	0.01	0.14	0.74	2.22	X		
Zinc	WHSSBI02	High	8.00	0.004	0.03	0.0001	3010.00	0.25	1.00	0.01	31.20	11.79	817.63		X	
	95UCL[b]	High	8.00	0.004	0.03	0.0001	283.00	0.02	1.00	0.01	5.75	11.79	817.63	X		
Aldrin	WHSSBE08	High	NA	0.004	NA	0.0001	0.0005	0.00000004	1.00	0.01	0.000004	0.16	1.55	X		
Heptachlor	WHSSB007	High	NA	0.004	NA	0.0001	0.001	0.0000001	1.00	0.01	0.00001	0.23	14.04	X		
Lindane	WHSSB017	High	NA	0.004	NA	0.0001	0.002	0.0000002	1.00	0.01	0.00002	0.10	4.54	X		
Total PAHs	WHSSBC06	High	NA	0.004	NA	0.0001	60.20	0.01	1.00	0.01	0.56	1.68	42.10	X		
Arsenic	WHSSBK06	Low	0.24	0.003	0.001	0.0001	27.10	0.002	1.00	0.02	0.14	0.75	8.32	X		
Cadmium	WHSSBI02	Low	0.02	0.003	0.0001	0.0001	20.80	0.001	1.00	0.02	0.08	0.08	3.41		X	
	95UCL[b]	Low	0.02	0.003	0.0001	0.0001	2.50	0.0002	1.00	0.02	0.01	0.08	3.41	X		
Copper	WHSSBH03	Low	0.54	0.003	0.001	0.0001	607.00	0.04	1.00	0.02	2.46	3.41	769.32	X		
	95UCL[b]	Low	0.54	0.003	0.001	0.0001	62.00	0.004	1.00	0.02	0.33	3.41	769.32	X		
Lead	WHSSBF03	Low	0.14	0.003	0.0004	0.0001	598.00	0.04	1.00	0.02	2.35	0.003	273.42		X	
	95UCL[b]	Low	0.14	0.003	0.0004	0.0001	101.00	0.01	1.00	0.02	0.42	0.003	273.42		X	
Mercury	WHSSB024	Low	0.01	0.003	0.00003	0.0001	7.10	0.0004	1.00	0.02	0.03	0.51	9.94	X		
Selenium	WHSSBC02	Low	0.18	0.003	0.0005	0.0001	4.80	0.0003	1.00	0.02	0.05	0.10	1.47	X		
	95UCL[b]	Low	0.18	0.003	0.0005	0.0001	0.64	0.00004	1.00	0.02	0.03	0.10	1.47	X		
Thallium	WHSSBD03	Low	0.31	0.003	0.001	0.0001	2.40	0.0001	1.00	0.02	0.06	0.74	2.22	X		
Zinc	WHSSBI02	Low	8.00	0.003	0.02	0.0001	3010.00	0.19	1.00	0.02	13.04	11.79	817.63		X	
	95UCL[b]	Low	8.00	0.003	0.02	0.0001	283.00	0.02	1.00	0.02	2.40	11.79	817.63	X		
Aldrin	WHSSBE08	Low	NA	0.003	NA	0.0001	0.0005	0.00000003	1.00	0.02	0.000002	0.16	1.55	X		
Heptachlor	WHSSB007	Low	NA	0.003	NA	0.0001	0.001	0.00000004	1.00	0.02	0.000003	0.23	14.04	X		
Lindane	WHSSB017	Low	NA	0.003	NA	0.0001	0.002	0.0000001	1.00	0.02	0.00001	0.10	4.54	X		
Total PAHs	WHSSBC06	Low	NA	0.003	NA	0.0001	60.20	0.004	1.00	0.02	0.23	1.68	42.10	X		
Arsenic	---	Ambient Hi	NA	0.004	NA	0.0001	27.00	0.002	1.00	0.01	0.25	0.75	8.32	X		
Cadmium	---	Ambient Hi	NA	0.004	NA	0.0001	1.90	0.0002	1.00	0.01	0.02	0.08	3.41	X		
Copper	---	Ambient Hi	NA	0.004	NA	0.0001	81.00	0.01	1.00	0.01	0.76	3.41	769.32	X		
Lead	---	Ambient Hi	NA	0.004	NA	0.0001	95.00	0.01	1.00	0.01	0.89	0.003	273.42		X	
Mercury	---	Ambient Hi	NA	0.004	NA	0.0001	0.32	0.00003	1.00	0.01	0.003	0.51	9.94	X		

TABLE T6-1

SALT MARSH HARVEST MOUSE DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	[Pickleweed] (mg/kg)	IR_{prey} (kg/d)	Ingestion from Prey (mg/d)	IR_{soil} (kg/d)	[Soil] (mg/kg)	Ingestion from Soil (mg/d)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Selenium	---	Ambient Hi	NA	0.004	NA	0.0001	0.64	0.0001	1.00	0.01	0.01	0.10	1.47	X		
Thallium	---	Ambient Hi	NA	0.004	NA	0.0001	2.20	0.0002	1.00	0.01	0.02	0.74	2.22	X		
Zinc	---	Ambient Hi	NA	0.004	NA	0.0001	264.00	0.02	1.00	0.01	2.46	11.79	817.63	X		
Arsenic	---	Ambient Lo	NA	0.003	NA	0.0001	27.00	0.002	1.00	0.02	0.11	0.75	8.32	X		
Cadmium	---	Ambient Lo	NA	0.003	NA	0.0001	1.90	0.0001	1.00	0.02	0.01	0.08	3.41	X		
Copper	---	Ambient Lo	NA	0.003	NA	0.0001	81.00	0.01	1.00	0.02	0.32	3.41	769.32	X		
Lead	---	Ambient Lo	NA	0.003	NA	0.0001	95.00	0.01	1.00	0.02	0.37	0.003	273.42		X	
Mercury	---	Ambient Lo	NA	0.003	NA	0.0001	0.32	0.00002	1.00	0.02	0.001	0.51	9.94	X		
Selenium	---	Ambient Lo	NA	0.003	NA	0.0001	0.64	0.00004	1.00	0.02	0.002	0.10	1.47	X		
Thallium	---	Ambient Lo	NA	0.003	NA	0.0001	2.20	0.0001	1.00	0.02	0.01	0.74	2.22	X		
Zinc	---	Ambient Lo	NA	0.003	NA	0.0001	264.00	0.02	1.00	0.02	1.03	11.79	817.63	X		
Cadmium	---	Amb Typical	NA	0.003	NA	0.0001	1.90	0.0001	1.00	0.01	0.01	0.08	3.41	X		
Copper	---	Amb Typical	NA	0.003	NA	0.0001	81.00	0.01	1.00	0.01	0.53	3.41	769.32	X		
Lead	---	Amb Typical	NA	0.003	NA	0.0001	95.00	0.01	1.00	0.01	0.62	0.003	273.42		X	
Selenium	---	Amb Typical	NA	0.003	NA	0.0001	0.64	0.00005	1.00	0.01	0.004	0.10	1.47	X		
Zinc	---	Amb Typical	NA	0.003	NA	0.0001	264.00	0.02	1.00	0.01	1.72	11.79	817.63	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th percent ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th percent ambient value
BW Body weight
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PAH Polynuclear aromatic hydrocarbon
PCB Polychlorinated biphenyl
[Pickleweed] Concentration of chemical in pickleweed
[Soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1
--- Not applicable to the analysis

TABLE T6-2

SALT MARSH HARVEST MOUSE HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sediment Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)
Arsenic	WHSSBK06	0.35	0.14	NA	0.75	8.32	0.02	0.46
Cadmium	WHSSBI02	0.20	0.08	0.14	0.08	3.41	0.02	**2.52**
	95UCL[a]	0.03	0.01	NA	0.08	3.41	0.004	0.39
Copper	WHSSBH03	5.88	2.46	4.11	3.41	769.32	0.003	**1.72**
	95UCL[a]	0.79	0.33	NA	3.41	769.32	0.0004	0.23
Lead	WHSSBF03	5.64	2.35	4.79	0.00	273.42	0.01	**1878.59**
	95UCL[a]	1.00	0.42	NA	0.00	273.42	0.002	**332.37**
Mercury	WHSSB022	0.07	0.03	NA	0.51	9.94	0.003	0.14
Selenium	WHSSBD03	0.11	0.05	0.08	0.10	1.47	0.03	**1.14**
	95UCL[a]	0.08	0.03	NA	0.10	1.47	0.02	0.75
Thallium	WHSSBD03	0.14	0.06	NA	0.74	2.22	0.03	0.19
Zinc	WHSSBI02	31.20	13.04	21.81	11.79	817.63	0.02	2.65
	95UCL[a]	5.75	2.40	NA	11.79	817.63	0.003	0.49
Aldrin	WHSSBE08	0.000004	0.000002	NA	0.155	1.55	0.000001	0.00003
Heptachlor	WHSSB007	0.00001	0.000003	NA	0.225	14.04	0.0000002	0.00003
Lindane	WHSSB017	0.00002	0.00001	NA	0.1	4.54	0.000002	0.0002
Total PAHs	WHSSBC06	0.56	0.23	NA	1.682	42.1	0.01	0.33
Arsenic	Ambient[b]	0.25	0.11	NA	0.75	8.32	0.01	0.34
Cadmium	Ambient[b]	0.02	0.01	0.01	0.08	3.41	0.002	0.22
Copper	Ambient[b]	0.76	0.32	0.53	3.41	769.32	0.0004	0.22
Lead	Ambient[b]	0.89	0.37	0.62	0.00	273.42	0.001	**295.56**
Mercury	Ambient[b]	0.003	0.001	NA	0.51	9.94	0.0001	0.01
Selenium	Ambient[b]	0.01	0.002	0.004	0.10	1.47	0.002	0.06
Thallium	Ambient[b]	0.02	0.01	NA	0.74	2.22	0.004	0.03
Zinc	Ambient[b]	2.46	1.03	1.72	11.79	817.63	0.001	0.21

Notes: **Bold font indicates an HQ greater than 1**

HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
PAH Polynuclear aromatic hydrocarbon
PCB Polychlorinated biphenyl
TRV Toxicity reference value
UCL Upper confidence limit

a The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1

b The Tidal Area 99th percent ambient value

TABLE T6-3

SALT MARSH HARVEST MOUSE DIOXIN CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	Dose Type	[Pickleweed] (µm/kg)	IR_{prey} (kg/day)	Ingestion from Prey (µg/day)	IR_{soil} (kg/day)	[Soil] (µg/kg)	Ingestion from Soil (µg/day)	SUF	BW (kg)	Dose (µg/kg/day)[a]	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
PCDD/Fs	WHSSB008	High	NA	0.004	NA	0.0001	0.73	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB009	High	NA	0.004	NA	0.0001	1.37	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB010	High	NA	0.004	NA	0.0001	0.38	0.00003	1.00	0.01	0.004	0.002	0.02		X	
PCDD/Fs	WHSSB016	High	NA	0.004	NA	0.0001	1.53	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB019	High	NA	0.004	NA	0.0001	0.62	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB050	High	NA	0.004	NA	0.0001	0.97	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB051	High	NA	0.004	NA	0.0001	0.72	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB008	Low	NA	0.003	NA	0.0001	0.73	0.00005	1.00	0.02	0.003	0.002	0.02		X	
PCDD/Fs	WHSSB009	Low	NA	0.003	NA	0.0001	1.37	0.0001	1.00	0.02	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB010	Low	NA	0.003	NA	0.0001	0.38	0.00002	1.00	0.02	0.001	0.002	0.02	X		
PCDD/Fs	WHSSB016	Low	NA	0.003	NA	0.0001	1.53	0.0001	1.00	0.02	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB019	Low	NA	0.003	NA	0.0001	0.62	0.00004	1.00	0.02	0.002	0.002	0.02	X		
PCDD/Fs	WHSSB050	Low	NA	0.003	NA	0.0001	0.97	0.0001	1.00	0.02	0.004	0.002	0.02		X	
PCDD/Fs	WHSSB051	Low	NA	0.003	NA	0.0001	0.72	0.0000	1.00	0.02	0.003	0.002	0.02		X	
PCDD/Fs	WHSSB008	Typical	NA	0.003	NA	0.0001	0.73	0.0001	1.00	0.01	0.005	0.002	0.02		X	
PCDD/Fs	WHSSB009	Typical	NA	0.003	NA	0.0001	1.37	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB010	Typical	NA	0.003	NA	0.0001	0.38	0.00003	1.00	0.01	0.002	0.002	0.02	X		
PCDD/Fs	WHSSB016	Typical	NA	0.003	NA	0.0001	1.53	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB019	Typical	NA	0.003	NA	0.0001	0.62	0.00005	1.00	0.01	0.004	0.002	0.02		X	
PCDD/Fs	WHSSB050	Typical	NA	0.003	NA	0.0001	0.97	0.0001	1.00	0.01	0.01	0.002	0.02		X	
PCDD/Fs	WHSSB051	Typical	NA	0.003	NA	0.0001	0.72	0.0001	1.00	0.01	0.005	0.002	0.02		X	

Notes:

BW	Body weight
IR_{prey}	Ingestion rate of prey
IR_{soil}	Ingestion rate of soil
kg/day	Kilograms per day
NA	Not available
PCDD	Polychlorinated dibenzodioxin
PCDF	Polychlorinated dibenzofuran
[pickleweed]	Concentration of chemical in pickleweed
[soil]	Concentration of chemical in soil
SUF	Site use factor
TRV	Toxicity reference value
µg/day	Micrograms per day
µg/kg/day	Micrograms per kilogram per day
µg/kg	Micrograms per kilogram

TABLE T6-3

SALT MARSH HARVEST MOUSE DIOXIN CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

a Point doses were calculated for each sample location

TABLE T6-4

SALT MARSH HARVEST MOUSE DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (µg/kg/day)	Low Dose (µg/kg/day)	Typical Dose (µg/kg/day)	Low TRV (µg/kg/day)	High TRV (µg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
PCDD/Fs	WHSSB008	0.01	0.003	0.005	0.002	0.03	0.11	**2.74**	0.27	**1.91**	0.19
PCDD/Fs	WHSSB009	0.01	0.01	0.01	0.002	0.03	0.21	**5.12**	0.51	**3.58**	0.36
PCDD/Fs	WHSSB010	0.00	0.001	0.002	0.002	0.03	0.06	**1.42**	0.14	0.99	0.10
PCDD/Fs	WHSSB016	0.01	0.01	0.01	0.002	0.03	0.24	**5.74**	0.57	**4.01**	0.40
PCDD/Fs	WHSSB019	0.01	0.002	0.004	0.002	0.03	0.10	**2.33**	0.23	**1.63**	0.16
PCDD/Fs	WHSSB050	0.01	0.004	0.01	0.002	0.03	0.15	**3.65**	0.36	**2.55**	0.25
PCDD/Fs	WHSSB051	0.01	0.003	0.005	0.002	0.03	0.11	**2.71**	0.27	**1.89**	0.19

Notes: **Bold font indicates a HQ greater than 1**

HQ Hazard quotient
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
SUF Site use factor
TRV Toxicity reference value
µg/kg/day Micrograms per kilogram per day

TABLE T6-5

GRAY FOX DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	WHSSBK06	High	217WHC2	0.22	0.34	0.08	27.10	0.01	0.26	0.75	2.95	0.09	0.17	1.93	X		
Cadmium	WHSSBI02	High	217WHC1	0.05	0.34	0.02	20.80	0.01	0.20	0.75	2.95	0.06	0.02	0.79		X	
	95 UCL[b]	High	217WHC1	0.05	0.34	0.02	2.50	0.01	0.02	0.75	2.95	0.01	0.02	0.79	X		
Copper	WHSSBH03	High	217WHC2	2.40	0.34	0.82	607.00	0.01	5.82	0.75	2.95	1.69	0.79	178.90		X	
	95 UCL[b]	High	217WHC2	2.40	0.34	0.82	62.00	0.01	0.59	0.75	2.95	0.36	0.79	178.90	X		
Lead	WHSSBF03	High	217WHC2	0.66	0.34	0.23	598.00	0.01	5.73	0.75	2.95	1.51	0.001	63.58		X	
	95 UCL[b]	High	217WHC2	0.66	0.34	0.23	101.00	0.01	0.97	0.75	2.95	0.30	0.001	63.58		X	
Mercury	WHSSB024	High	1/2 DL[c]	0.02	0.34	0.01	7.10	0.01	0.07	0.75	2.95	0.02	0.02	0.18		X	
	95 UCL[b]	High	1/2 DL[c]	0.02	0.34	0.01	0.37	0.01	0.004	0.75	2.95	0.003	0.02	0.18	X		
Selenium	WHSSBC02	High	217WHC2	0.51	0.34	0.17	4.80	0.01	0.05	0.75	2.95	0.06	0.02	0.34		X	
	95 UCL[b]	High	217WHC2	0.51	0.34	0.17	0.64	0.01	0.01	0.75	2.95	0.05	0.02	0.34		X	
Thallium	WHSSBD03	High	217WHC3	0.21	0.34	0.07	2.40	0.01	0.02	0.75	2.95	0.02	0.17	0.52	X		
Zinc	WHSSBI02	High	217WHC2	48.40	0.34	16.55	3010.00	0.01	28.84	0.75	2.95	11.54	2.74	190.13		X	
	95 UCL[b]	High	217WHC2	48.40	0.34	16.55	283.00	0.01	2.71	0.75	2.95	4.90	2.74	190.13		X	
Aldrin	WHSSBE08	High	NA	NA	0.34	NA	0.0005	0.01	0.000005	0.75	2.95	0.000001	0.01	0.36	X		
Heptachlor	WHSSB007	High	NA	NA	0.34	NA	0.001	0.01	0.00001	0.75	2.95	0.000002	0.05	3.27	X		
Lindane	WHSSB017	High	NA	NA	0.34	NA	0.002	0.01	0.00002	0.75	2.95	0.000005	0.06	1.05	X		
Total PCBs	S37-10	High	217WHC2	0.02	0.34	0.01	1.60	0.01	0.02	0.75	2.95	0.01	0.10	0.36	X		
Benzo(a)pyrene	WHSSBC06	High	NA	NA	0.34	NA	2.70	0.01	0.03	0.75	2.95	0.01	0.39	9.79	X		
Arsenic	WHSSBK06	Low	217WHC2	0.22	0.17	0.04	27.10	0.005	0.13	0.50	7.04	0.01	0.17	1.93	X		
Cadmium	WHSSBI02	Low	217WHC1	0.05	0.17	0.01	20.80	0.005	0.10	0.50	7.04	0.01	0.02	0.79	X		
	95 UCL[b]	Low	217WHC1	0.05	0.17	0.01	2.50	0.005	0.01	0.50	7.04	0.001	0.02	0.79	X		
Copper	WHSSBH03	Low	217WHC2	2.40	0.17	0.40	607.00	0.005	2.85	0.50	7.04	0.23	0.79	178.90	X		
	95 UCL[b]	Low	217WHC2	2.40	0.17	0.40	62.00	0.005	0.29	0.50	7.04	0.05	0.79	178.90	X		
Lead	WHSSBF03	Low	217WHC2	0.66	0.17	0.11	598.00	0.005	2.81	0.50	7.04	0.21	0.001	63.58		X	
	95 UCL[b]	Low	217WHC2	0.66	0.17	0.11	101.00	0.005	0.47	0.50	7.04	0.04	0.001	63.58		X	
Mercury	WHSSB024	Low	1/2 DL[c]	0.02	0.17	0.003	7.10	0.005	0.03	0.50	7.04	0.003	0.02	0.18	X		
	95 UCL[b]	Low	1/2 DL[c]	0.02	0.17	0.003	0.37	0.005	0.002	0.50	7.04	0.0004	0.02	0.18	X		
Selenium	WHSSBC02	Low	217WHC2	0.51	0.17	0.09	4.80	0.005	0.02	0.50	7.04	0.01	0.02	0.34	X		
	95 UCL	Low	217WHC2	0.51	0.17	0.09	0.64	0.005	0.003	0.50	7.04	0.01	0.02	0.34	X		
Thallium	WHSSBD03	Low	217WHC3	0.21	0.17	0.04	2.40	0.005	0.01	0.50	7.04	0.003	0.17	0.52	X		
Zinc	WHSSBI02	Low	217WHC2	48.40	0.17	8.08	3010.00	0.005	14.15	0.50	7.04	1.58	2.74	190.13	X		
	95 UCL[b]	Low	217WHC2	48.40	0.17	8.08	283.00	0.005	1.33	0.50	7.04	0.67	2.74	190.13	X		
Aldrin	WHSSBE08	Low	NA	NA	0.17	NA	0.0005	0.005	0.000002	0.50	7.04	0.0000002	0.01	0.36			
Heptachlor	WHSSB007	Low	NA	NA	0.17	NA	0.001	0.005	0.000003	0.50	7.04	0.0000002	0.05	3.27			
Lindane	WHSSB017	Low	NA	NA	0.17	NA	0.002	0.005	0.00001	0.50	7.04	0.000001	0.06	1.05			
Total PCBs	WHSSB009	Low	217WHC2	0.02	0.17	0.004	1.60	0.005	0.01	0.50	7.04	0.001	0.10	0.36	X		
Benzo(a)pyrene	WHSSBC06	Low	NA	NA	0.17	NA	2.70	0.005	0.01	0.50	7.04	0.001	0.39	9.79			
Cadmium	---	Typical	217WHC1	0.05	0.25	0.01	20.80	0.01	0.15	0.75	3.84	0.03	0.02	0.79			
Copper	---	Typical	217WHC2	2.40	0.25	0.61	607.00	0.01	4.33	0.75	3.84	0.97	0.79	178.90		X	
Lead	---	Typical	217WHC2	0.66	0.25	0.17	728.00	0.01	5.20	0.75	3.84	1.05	0.001	63.58		X	
Mercury	---	Typical	1/2 DL[c]	0.02	0.25	0.01	18.50	0.01	0.13	0.75	3.84	0.03	0.02	0.18		X	
Selenium	---	Typical	217WHC2	0.51	0.25	0.13	4.80	0.01	0.03	0.75	3.84	0.03	0.02	0.34		X	
Zinc	---	Typical	217WHC2	48.40	0.25	12.32	3010.00	0.01	21.49	0.75	3.84	6.61	2.74	190.13		X	

TABLE T6-5

GRAY FOX DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	---	Ambient Hi	NA	NA	0.34	NA	27.00	0.01	0.26	0.75	2.95	0.07	0.17	1.93	X		
Cadmium	---	Ambient Hi	NA	NA	0.34	NA	1.90	0.01	0.02	0.75	2.95	0.005	0.02	0.79	X		
Copper	---	Ambient Hi	NA	NA	0.34	NA	81.00	0.01	0.78	0.75	2.95	0.20	0.79	178.90	X		
Lead	---	Ambient Hi	NA	NA	0.34	NA	95.00	0.01	0.91	0.75	2.95	0.23	0.001	63.58		X	
Mercury	---	Ambient Hi	NA	NA	0.34	NA	0.32	0.01	0.003	0.75	2.95	0.001	0.02	0.18	X		
Selenium	---	Ambient Hi	NA	NA	0.34	NA	0.64	0.01	0.01	0.75	2.95	0.002	0.02	0.34	X		
Thallium	---	Ambient Hi	NA	NA	0.34	NA	2.20	0.01	0.02	0.75	2.95	0.01	0.17	0.52	X		
Zinc	---	Ambient Hi	NA	NA	0.34	NA	264.00	0.01	2.53	0.75	2.95	0.64	2.74	190.13	X		
Total PCBs	---	Ambient Hi	NA	NA	0.34	NA	14.80	0.01	0.14	0.75	2.95	0.04	0.10	0.36	X		
Arsenic	---	Ambient Lo	NA	NA	0.17	NA	27.00	0.005	0.13	0.50	7.04	0.01	0.17	1.93	X		
Cadmium	---	Ambient Lo	NA	NA	0.17	NA	1.90	0.005	0.01	0.50	7.04	0.001	0.02	0.79	X		
Copper	---	Ambient Lo	NA	NA	0.17	NA	81.00	0.005	0.38	0.50	7.04	0.03	0.79	178.90	X		
Lead	---	Ambient Lo	NA	NA	0.17	NA	95.00	0.005	0.45	0.50	7.04	0.03	0.001	63.58		X	
Mercury	---	Ambient Lo	NA	NA	0.17	NA	0.32	0.005	0.002	0.50	7.04	0.0001	0.02	0.18	X		
Selenium	---	Ambient Lo	NA	NA	0.17	NA	0.64	0.005	0.003	0.50	7.04	0.0002	0.02	0.34	X		
Thallium	---	Ambient Lo	NA	NA	0.17	NA	2.20	0.005	0.01	0.50	7.04	0.001	0.17	0.52	X		
Zinc	---	Ambient Lo	NA	NA	0.17	NA	264.00	0.005	1.24	0.50	7.04	0.09	2.74	190.13	X		
Total PCBs	---	Ambient Lo	NA	NA	0.17	NA	14.80	0.005	0.07	0.50	7.04	0.005	0.10	0.36	X		
Cadmium	---	Amb Typical	NA	NA	0.25	NA	1.90	0.01	0.01	0.75	3.84	0.003	0.02	0.79			
Copper	---	Amb Typical	NA	NA	0.25	NA	81.00	0.01	0.58	0.75	3.84	0.11	0.79	178.90	X		
Lead	---	Amb Typical	NA	NA	0.25	NA	95.00	0.01	0.68	0.75	3.84	0.13	0.001	63.58		X	
Mercury	---	Amb Typical	NA	NA	0.25	NA	0.32	0.01	0.002	0.75	3.84	0.0004	0.02	0.18	X		
Selenium	---	Amb Typical	NA	NA	0.25	NA	0.64	0.01	0.005	0.75	3.84	0.001	0.02	0.34	X		
Zinc	---	Amb Typical	NA	NA	0.25	NA	264.00	0.01	1.88	0.75	3.84	0.37	2.74	190.13	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th ambient value
BW Body weight
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[prey] Concentration of chemical in prey
[soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b The dose for the 95 percent upper cofidence limit was only calculated for chemicals with an HQ greater than 1
c Half the detection limit was used as the concentration when a chemical was below the detection limit
--- Not applicable to the analysis

TABLE T6-6

GRAY FOX HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	WHSSBK06	0.09	0.01	NA	0.17	1.93	0.01	0.50	0.04	NA	NA
Cadmium	WHSSBI02	0.06	0.01	0.03	0.02	0.79	0.01	**2.75**	NA	**1.58**	0.04
	95 UCL[a]	0.01	0.001	NA	0.02	0.79	0.002	0.52	NA	NA	NA
Copper	WHSSBH03	1.69	0.23	0.97	0.79	178.90	0.001	**2.12**	0.01	**1.22**	0.01
	95 UCL[a]	0.36	0.05	NA	0.79	178.90	0.0003	0.45	0.002	NA	NA
Lead	WHSSBF03	1.51	0.21	1.05	0.001	63.58	0.003	**2162.67**	0.02	**1498.35**	0.02
Mercury	WHSSB024	0.02	0.003	0.003	0.02	0.18	0.01	**1.05**	0.10	0.16	0.02
	95 UCL[a]	0.003	0.0004	NA	0.02	0.18	0.002	0.15	0.01	NA	NA
Selenium	WHSSBC02	0.06	0.01	0.03	0.02	0.34	0.02	**2.38**	0.16	**1.36**	0.09
	95 UCL[a]	0.05	0.01	NA	0.02	0.34	0.02	**1.95**	0.13	NA	NA
Thallium	WHSSBD03	0.02	0.003	NA	0.17	0.52	0.01	0.14	0.05	NA	NA
Zinc	WHSSBI02	11.54	1.58	6.61	2.74	190.13	0.01	**4.21**	0.06	**2.41**	0.03
	95 UCL[a]	4.90	0.67	NA	2.74	190.13	0.004	**1.79**	0.03	NA	NA
Aldrin	WHSSBE08	0.000001	0.0000002	NA	0.01	0.36	0.0000004	0.0001	0.000003	NA	NA
Heptachlor	WHSSB007	0.000002	0.0000002	NA	0.05	3.27	0.0000001	0.00003	0.0000005	NA	NA
Lindane	WHSSB017	0.000005	0.000001	NA	0.06	1.05	0.000001	0.0001	0.000005	NA	NA
Total PCBs	S37-10	0.01	0.001	NA	0.10	0.36	0.002	0.06	0.02	NA	NA
Benzo(a)pyrene	WHSSBC06	0.01	0.001	NA	0.39	9.79	0.0001	0.02	0.001	NA	NA
Arsenic	Ambient[b]	0.07	0.01	NA	0.17	1.93	0.005	0.39	0.03	NA	NA
Cadmium	Ambient[b]	0.005	0.001	0.003	0.02	0.79	0.001	0.23	0.01	0.13	0.003
Copper	Ambient[b]	0.20	0.03	0.11	0.79	178.90	0.0002	0.25	0.001	0.14	0.001
Lead	Ambient[b]	0.23	0.03	0.13	0.001	63.58	0.0005	**330.54**	0.004	**189.41**	0.002
Mercury	Ambient[b]	0.001	0.0001	0.0004	0.02	0.18	0.001	0.04	0.004	0.02	0.002
Selenium	Ambient[b]	0.002	0.0002	0.001	0.02	0.34	0.001	0.07	0.005	0.04	0.003
Thallium	Ambient[b]	0.01	0.001	NA	0.17	0.52	0.001	0.03	0.01	NA	NA
Zinc	Ambient[b]	0.64	0.09	0.37	2.74	190.13	0.0005	0.23	0.003	0.13	0.002
Total PCBs	Ambient[b]	0.04	0.005	NA	0.10	0.36	0.01	0.37	0.10	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
PCB Polychlorinated biphenyl
TRV Toxicity reference value
UCL Upper confidence limit

a The dose for the 95 percent upper confidence limit was only calculated for chemicals with an HQ greater than 1

b The Tidal Area 99th percent ambient value

TABLE T6-7

GRAY FOX DIOXIN DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	Dose Type	[Prey] (µg/kg)	IR_{prey} (kg/day)	Ingestion from Prey (µg/day)	IR_{soil} (kg/day)	[Soil] (µg/kg)	Ingestion from Soil (µg/day)	SUF	BW (kg)	Dose (µg/kg/day)[a]	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
PCDD/Fs	WHSSB008	High	0.003	0.34	0.001	0.01	0.73	0.01	0.75	2.95	0.002	0.001	0.01		X	
PCDD/Fs	WHSSB009	High	0.003	0.34	0.001	0.01	1.37	0.01	0.75	2.95	0.004	0.001	0.01		X	
PCDD/Fs	WHSSB010	High	0.003	0.34	0.001	0.01	0.38	0.004	0.75	2.95	0.001	0.001	0.01		X	
PCDD/Fs	WHSSB016	High	0.003	0.34	0.001	0.01	1.53	0.01	0.75	2.95	0.004	0.001	0.01		X	
PCDD/Fs	WHSSB019	High	0.003	0.34	0.001	0.01	0.62	0.01	0.75	2.95	0.002	0.001	0.01		X	
PCDD/Fs	WHSSB050	High	0.003	0.34	0.001	0.01	0.97	0.01	0.75	2.95	0.003	0.001	0.01		X	
PCDD/Fs	WHSSB051	High	0.003	0.34	0.001	0.01	0.72	0.01	0.75	2.95	0.002	0.001	0.01		X	
PCDD/Fs	WHSSB008	Low	0.003	0.17	0.0005	0.005	0.73	0.003	0.5	7.04	0.0003	0.001	0.01	X		
PCDD/Fs	WHSSB009	Low	0.003	0.17	0.0005	0.005	1.37	0.01	0.5	7.04	0.0005	0.001	0.01	X		
PCDD/Fs	WHSSB010	Low	0.003	0.17	0.0005	0.005	0.38	0.002	0.5	7.04	0.0002	0.001	0.01	X		
PCDD/Fs	WHSSB016	Low	0.003	0.17	0.0005	0.005	1.53	0.01	0.5	7.04	0.001	0.001	0.01	X		
PCDD/Fs	WHSSB019	Low	0.003	0.17	0.0005	0.005	0.62	0.003	0.5	7.04	0.0002	0.001	0.01	X		
PCDD/Fs	WHSSB050	Low	0.003	0.17	0.0005	0.005	0.97	0.005	0.5	7.04	0.0004	0.001	0.01	X		
PCDD/Fs	WHSSB051	Low	0.003	0.17	0.0005	0.005	0.72	0.003	0.5	7.04	0.0003	0.001	0.01	X		
PCDD/Fs	WHSSB008	Typical	0.003	0.25	0.001	0.01	0.73	0.01	0.75	3.837	0.001	0.001	0.01		X	
PCDD/Fs	WHSSB009	Typical	0.003	0.25	0.001	0.01	1.37	0.01	0.75	3.837	0.002	0.001	0.01		X	
PCDD/Fs	WHSSB010	Typical	0.003	0.25	0.001	0.01	0.38	0.003	0.75	3.837	0.001	0.001	0.01		X	
PCDD/Fs	WHSSB016	Typical	0.003	0.25	0.001	0.01	1.53	0.01	0.75	3.837	0.002	0.001	0.01		X	
PCDD/Fs	WHSSB019	Typical	0.003	0.25	0.001	0.01	0.62	0.004	0.75	3.837	0.001	0.001	0.01		X	
PCDD/Fs	WHSSB050	Typical	0.003	0.25	0.001	0.01	0.97	0.01	0.75	3.837	0.001	0.001	0.01		X	
PCDD/Fs	WHSSB051	Typical	0.003	0.25	0.001	0.01	0.72	0.01	0.75	3.837	0.001	0.001	0.01		X	

Notes:

BW	Body weight
IR_{prey}	Ingestion rate of prey
IR_{soil}	Ingestion rate of soil
kg/day	Kilograms per day
NA	Not available
PCDD	Polychlorinated dibenzodioxin
PCDF	Polychlorinated dibenzofuran
[prey]	Concentration of chemical in prey
[soil]	Concentration of chemical in soil
SUF	Site use factor
TRV	Toxicity reference value
µg/day	Micrograms per day
µg/kg/day	Micrograms per kilogram per day
µg/kg	Micrograms per kilogram
a	Point doses were calculated for each sample location

TABLE T6-8

GRAY FOX DIOXIN DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (µg/kg/day)	Low Dose (µg/kg/day)	Typical Dose (µg/kg/day)	Low TRV (µg/kg/day)	High TRV (µg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
PCDD/Fs	WHSSB008	0.002	0.0003	0.001	0.001	0.006	0.05	**3.48**	0.35	**1.99**	0.20
PCDD/Fs	WHSSB009	0.004	0.0005	0.002	0.001	0.006	0.08	**6.15**	0.62	**3.52**	0.35
PCDD/Fs	WHSSB010	0.001	0.0002	0.001	0.001	0.006	0.03	**2.01**	0.20	**1.15**	0.12
PCDD/Fs	WHSSB016	0.004	0.001	0.002	0.001	0.006	0.09	**6.84**	0.69	**3.91**	0.39
PCDD/Fs	WHSSB019	0.002	0.0002	0.001	0.001	0.006	0.04	**3.03**	0.30	**1.73**	0.17
PCDD/Fs	WHSSB050	0.003	0.0004	0.001	0.001	0.006	0.06	**4.50**	0.45	**2.57**	0.26
PCDD/Fs	WHSSB051	0.002	0.0003	0.001	0.001	0.006	0.05	**3.45**	0.35	**1.98**	0.20

Notes: **Bold font indicates a HQ greater than 1**

HQ Hazard quotient
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
SUF Site use factor
TRV Toxicity reference value
µg/kg/day Micrograms per kilogram per day

TABLE T6-9

NORTHERN HARRIER DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	Mouse Sample ID	[Prey] (mg/kg)	IR_{prey} (kg/day)	Ingestion from Prey	[soil] (mg/kg)	IR_{soil} (kg/day) 2.8%	Ingestion from Soil	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	WHSSBK06	High	217WHC2	0.22	0.04	0.01	27.10	0.0003	0.01	0.75	0.30	0.04	14.64	58.57	X		
Cadmium	WHSSBI02	High	217WHC1	0.05	0.04	0.002	20.80	0.0003	0.01	0.75	0.30	0.02	0.15	1.99	X		
Copper	WHSSBH03	High	217WHC2	2.40	0.04	0.10	607.00	0.0003	0.18	0.75	0.30	0.70	3.34	51.30	X		
Lead	WHSSBF03	High	217WHC2	0.66	0.04	0.03	598.00	0.0003	0.17	0.75	0.30	0.51	0.003	15.89		X	
	95 UCL[b]	High	217WHC3	0.66	0.04	0.03	101.00	0.0003	0.03	0.75	0.30	0.14	0.003	15.89		X	
Mercury	WHSSB024	High	1/2 DL[c]	0.02	0.04	0.001	7.10	0.0003	0.002	0.75	0.30	0.01	0.09	0.41	X		
Selenium	WHSSBC02	High	217WHC2	0.51	0.04	0.02	4.80	0.0003	0.001	0.75	0.30	0.06	0.58	2.34	X		
Zinc	WHSSBI02	High	217WHC2	48.40	0.04	2.01	3010.00	0.0003	0.88	0.75	0.30	7.26	37.29	372.89	X		
Total PCBs	WHSSB009	High	217WHC2	0.02	0.04	0.001	0.07	0.0003	0.00002	0.75	0.30	0.003	0.16	4.95	X		
Arsenic	WHSSBK06	Low	217WHC2	0.22	0.03	0.01	27.10	0.0002	0.01	0.50	0.60	0.01	14.64	58.57	X		
Cadmium	WHSSBI02	Low	217WHC1	0.05	0.03	0.001	20.80	0.0002	0.004	0.50	0.60	0.004	0.15	1.99	X		
Copper	WHSSBH03	Low	217WHC2	2.40	0.03	0.06	607.00	0.0002	0.11	0.50	0.60	0.15	3.34	51.30	X		
Lead	WHSSBF03	Low	217WHC2	0.66	0.03	0.02	598.00	0.0002	0.11	0.50	0.60	0.11	0.003	15.89		X	
	95 UCL[b]	Low	217WHC2	0.66	0.03	0.02	101.00	0.0002	0.02	0.50	0.60	0.03	0.003	15.89		X	
Mercury	WHSSB024	Low	1/2 DL[c]	0.02	0.03	0.001	7.10	0.0002	0.001	0.50	0.60	0.002	0.09	0.41	X		
Selenium	WHSSBC02	Low	217WHC2	0.51	0.03	0.01	4.80	0.0002	0.001	0.50	0.60	0.01	0.58	2.34	X		
Zinc	WHSSBI02	Low	217WHC2	48.40	0.03	1.28	3010.00	0.0002	0.56	0.50	0.60	1.54	37.29	372.89	X		
Total PCBs	WHSSB009	Low	217WHC2	0.02	0.03	0.001	0.07	0.0002	0.00001	0.50	0.60	0.0005	0.16	4.95	X		
Lead	WHSSBF03	Typical	217WHC2	0.66	0.03	0.02	598.00	0.0002	0.14	0.75	0.44	0.28	0.003	15.89		X	
	95 UCL[b]	Typical	217WHC2	0.66	0.03	0.02	101.00	0.0002	0.02	0.75	0.44	0.08	0.003	15.89		X	
Arsenic	---	Ambient Hi	NA	NA	0.04	NA	27.00	0.0003	0.01	0.75	0.30	0.02	14.64	58.57	X		
Cadmium	---	Ambient Hi	NA	NA	0.04	NA	1.90	0.0003	0.001	0.75	0.30	0.001	0.15	1.99	X		
Copper	---	Ambient Hi	NA	NA	0.04	NA	81.00	0.0003	0.02	0.75	0.30	0.06	3.34	51.30	X		
Lead	---	Ambient Hi	NA	NA	0.04	NA	95.00	0.0003	0.03	0.75	0.30	0.07	0.003	15.89		X	
Mercury	---	Ambient Hi	NA	NA	0.04	NA	0.32	0.0003	0.0001	0.75	0.30	0.0002	0.09	0.41	X		
Selenium	---	Ambient Hi	NA	NA	0.04	NA	0.64	0.0003	0.0002	0.75	0.30	0.0005	0.58	2.34	X		
Zinc	---	Ambient Hi	NA	NA	0.04	NA	264.00	0.0003	0.08	0.75	0.30	0.19	37.29	372.89	X		
Total PCBs	---	Ambient Hi	NA	NA	0.04	NA	14.80	0.0003	0.004	0.75	0.30	0.01	0.16	4.95	X		
Arsenic	---	Ambient Lo	NA	NA	0.03	NA	27.00	0.0002	0.005	0.50	0.60	0.004	14.64	58.57	X		
Cadmium	---	Ambient Lo	NA	NA	0.03	NA	1.90	0.0002	0.0004	0.50	0.60	0.0003	0.15	1.99	X		
Copper	---	Ambient Lo	NA	NA	0.03	NA	81.00	0.0002	0.01	0.50	0.60	0.01	3.34	51.30	X		
Lead	---	Ambient Lo	NA	NA	0.03	NA	95.00	0.0002	0.02	0.50	0.60	0.01	0.003	15.89		X	
Mercury	---	Ambient Lo	NA	NA	0.03	NA	0.32	0.0002	0.0001	0.50	0.60	0.00005	0.09	0.41	X		
Selenium	---	Ambient Lo	NA	NA	0.03	NA	0.64	0.0002	0.0001	0.50	0.60	0.0001	0.58	2.34	X		
Zinc	---	Ambient Lo	NA	NA	0.03	NA	264.00	0.0002	0.05	0.50	0.60	0.04	37.29	372.89	X		
Total PCBs	---	Ambient Lo	NA	NA	0.03	NA	14.80	0.0002	0.003	0.50	0.60	0.002	0.16	4.95	X		
Lead	---	Amb Typical	NA	NA	0.03	NA	95.00	0.0002	0.02	0.75	0.44	0.04	0.003	15.89		X	

TABLE T6-9

NORTHERN HARRIER DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Notes:

Ambient Hi	The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo	The low dose calculation using the Tidal Area 99th percent ambient value
Amb Typical	The typical dose calculation using the Tidal Area 99th percent ambient value
BW	Body weight
DL	Detection limit
IR_{prey}	Ingestion rate of prey
IR_{soil}	Ingestion rate of soil
kg/day	Kilograms per day
mg/d	Milligrams per day
mg/kg	Milligrams per kilogram
mg/kg/day	Milligrams per kilogram per day
NA	Not available
PCB	Polychlorinated biphenyl
[prey]	Concentration of chemical in prey
[soil]	Concentration of chemical in soil
SUF	Site use factor
TRV	Toxicity reference value
UCL	Upper confidence limit

a Chemicals were selected based on available TRV information

b The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1

c One-half the detection limit was used as the concentration when a chemical was below the DL.

--- Not applicable to the analysis

TABLE T6-10

NORTHERN HARRIER HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sediment Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	WHSSBK06	0.04	0.01	NA	14.64	58.57	0.0002	0.003	0.001	NA	NA
Cadmium	WHSSBI02	0.02	0.004	NA	0.15	1.99	0.002	0.14	0.01	NA	NA
Copper	WHSSBH03	0.70	0.15	NA	3.34	51.30	0.003	0.21	0.01	NA	NA
Lead	WHSSBF03	0.51	0.11	0.28	0.003	15.89	0.007	**168.97**	0.03	**93.40**	0.02
	95UCL[a]	0.14	0.03	0.08	0.003	15.89	0.002	**47.64**	0.01	**26.35**	0.005
Mercury	WHSSB024	0.01	0.002	NA	0.09	0.41	0.004	0.08	0.02	NA	NA
Selenium	WHSSBC02	0.06	0.01	NA	0.58	2.34	0.005	0.10	0.02	NA	NA
Zinc	WHSSBI02	7.26	1.54	NA	37.29	372.89	0.004	0.19	0.02	NA	NA
Total PCBs	WHSSB009	0.003	0.001	NA	0.16	4.95	0.0001	0.02	0.001	NA	NA
Arsenic	Ambient[b]	0.02	0.004	NA	14.64	58.57	0.0001	0.001	0.0003	NA	NA
Cadmium	Ambient[b]	0.001	0.0003	NA	0.15	1.99	0.0001	0.01	0.001	NA	NA
Copper	Ambient[b]	0.06	0.01	NA	3.34	51.30	0.0002	0.02	0.001	NA	NA
Lead	Ambient[b]	0.07	0.01	0.04	0.003	15.89	0.001	**23.19**	0.004	**12.82**	0.002
Mercury	Ambient[b]	0.0002	0.00005	NA	0.09	0.41	0.0001	0.003	0.001	NA	NA
Selenium	Ambient[b]	0.0005	0.0001	NA	0.58	2.34	0.00004	0.001	0.0002	NA	NA
Zinc	Ambient[b]	0.19	0.04	NA	37.29	372.89	0.0001	0.01	0.001	NA	NA
Total PCBs	Ambient[b]	0.01	0.002	NA	0.16	4.95	0.0005	0.07	0.002	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

HQ Hazard quotient

mg/kg/day Milligrams per kilogram per day

NA Not available

PCB Polychlorinated biphenyl

TRV Toxicity reference value

UCL Upper confidence limit

a The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1

b The Tidal Area 99th percent ambient value

TABLE T6-11

NORTHERN HARRIER DIOXIN DOSE CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	Dose Type	[Prey] (µm/kg)	IR_{prey} (kg/day)	Ingestion from Prey (µg/day)	IR_{soil} (kg/day)	[Soil] (µg/kg)	Ingestion from Soil (µg/day)	SUF	BW (kg)	Dose (µg/kg/day)[a]	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
PCDD/Fs	WHSSB008	High	0.003	0.04	0.0001	0.0003	0.82	0.0002	0.75	0.30	0.001	0.003	0.35	X		
PCDD/Fs	WHSSB009	High	0.003	0.04	0.0001	0.0003	1.46	0.0004	0.75	0.30	0.001	0.003	0.35	X		
PCDD/Fs	WHSSB010	High	0.003	0.04	0.0001	0.0003	0.42	0.0001	0.75	0.30	0.001	0.003	0.35	X		
PCDD/Fs	WHSSB016	High	0.003	0.04	0.0001	0.0003	1.48	0.0004	0.75	0.30	0.001	0.003	0.35	X		
PCDD/Fs	WHSSB019	High	0.003	0.04	0.0001	0.0003	0.67	0.0002	0.75	0.30	0.001	0.003	0.35	X		
PCDD/Fs	WHSSB050	High	0.003	0.04	0.0001	0.0003	1.08	0.0003	0.75	0.30	0.001	0.003	0.35	X		
PCDD/Fs	WHSSB051	High	0.003	0.04	0.0001	0.0003	0.82	0.0002	0.75	0.30	0.001	0.003	0.35	X		
PCDD/Fs	WHSSB008	Low	0.003	0.03	0.0001	0.0002	0.82	0.0002	0.50	0.60	0.0002	0.003	0.35	X		
PCDD/Fs	WHSSB009	Low	0.003	0.03	0.0001	0.0002	1.46	0.0003	0.50	0.60	0.0003	0.003	0.35	X		
PCDD/Fs	WHSSB010	Low	0.003	0.03	0.0001	0.0002	0.42	0.0001	0.50	0.60	0.0001	0.003	0.35	X		
PCDD/Fs	WHSSB016	Low	0.003	0.03	0.0001	0.0002	1.48	0.0003	0.50	0.60	0.0003	0.003	0.35	X		
PCDD/Fs	WHSSB019	Low	0.003	0.03	0.0001	0.0002	0.67	0.0001	0.50	0.60	0.0002	0.003	0.35	X		
PCDD/Fs	WHSSB050	Low	0.003	0.03	0.0001	0.0002	1.08	0.0002	0.50	0.60	0.0002	0.003	0.35	X		
PCDD/Fs	WHSSB051	Low	0.003	0.03	0.0001	0.0002	0.82	0.0002	0.50	0.60	0.0002	0.003	0.35	X		

Notes:

BW Body weight
IR_{prey} Ingestion rate of prey
IR_{soil} Ingestion rate of soil
kg/day Kilograms per day
NA Not available
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
[prey] Concentration of chemical in prey
[soil] Concentration of chemical in soil
SUF Site use factor
TRV Toxicity reference value
µg/day Micrograms per day
µg/kg/day Micrograms per kilogram per day
µg/kg Micrograms per kilogram

a Point doses were calculated for each sample location

TABLE T6-12

NORTHERN HARRIER DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE WOOD HOGGER TERRESTRIAL UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (µg/kg/day)	Low Dose (µg/kg/day)	Low TRV (µg/kg/day)	High TRV (µg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)
PCDD/Fs	WHSSB008	0.001	0.0002	0.003	0.35	0.001	0.25	0.003
PCDD/Fs	WHSSB009	0.001	0.0003	0.003	0.35	0.001	0.38	0.004
PCDD/Fs	WHSSB010	0.001	0.0001	0.003	0.35	0.0004	0.17	0.002
PCDD/Fs	WHSSB016	0.001	0.0003	0.003	0.35	0.001	0.39	0.004
PCDD/Fs	WHSSB019	0.001	0.0002	0.003	0.35	0.000	0.22	0.002
PCDD/Fs	WHSSB050	0.001	0.0002	0.003	0.35	0.001	0.30	0.003
PCDD/Fs	WHSSB051	0.001	0.0002	0.003	0.35	0.001	0.25	0.003

Notes:

HQ	Hazard quotient
PCDD	Polychlorinated dibenzodioxin
PCDF	Polychlorinated dibenzofuran
SUF	Site use factor
TRV	Toxicity reference value
µg/kg/day	Micrograms per kilogram per day

ATTACHMENT T7

FOOD-CHAIN MODELING CALCULATIONS FOR THE OTTER SLUICE (NORTH AND SOUTH)

LIST OF TABLES

Table

T7-1 GREAT BLUE HERON DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT

T7-2 GREAT BLUE HERON HAZARD QUOTIENT CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT

T7-3 CALIFORNIA BLACK RAIL DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT

T7-4 CALIFORNIA BLACK RAIL HAZARD QUOTIENT CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT

T7-5 RIVER OTTER DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT

T7-6 RIVER OTTER HAZARD QUOTIENT CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT

T7-7 GREAT BLUE HERON DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT

T7-8 GREAT BLUE HERON HAZARD QUOTIENT CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT

T7-9 CALIFORNIA BLACK RAIL DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT

T7-10 CALIFORNIA BLACK RAIL HAZARD QUOTIENT CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT

T7-11 RIVER OTTER DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT

T7-12 RIVER OTTER HAZARD QUOTIENT CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT

T7-13 GREAT BLUE HERON DIOXIN DOSE CALCULATIONS IN THE OTTER SLUICE

T7-14 GREAT BLUE HERON DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE OTTER SLUICE

T7-15 CALIFORNIA BLACK RAIL DIOXIN DOSE CALCULATIONS IN THE OTTER SLUICE

T7-16 CALIFORNIA BLACK RAIL DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE OTTER SLUICE

T7-17 RIVER OTTER DIOXIN DOSE CALCULATIONS IN THE OTTER SLUICE

T7-18 RIVER OTTER DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE OTTER SLUICE

TABLE T7-1

GREAT BLUE HERON DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 3.3%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose[b] (mg/kg day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	RADSBA07	High	0.11	0.12	0.11	0.01	47.20	0.003	0.16	1.00	2.09	0.08	2.70	10.80	X		
Copper	RADSBA07	High	0.11	1.20	0.11	0.13	272.00	0.003	0.94	1.00	2.09	0.51	0.62	8.94	X		
Lead	RADSBA02	High	0.11	0.07	0.11	0.01	182.00	0.003	0.63	1.00	2.09	0.31	0.0005	2.93		X	
	95 UCL[d]	High	0.11	0.07	0.11	0.01	87.40	0.003	0.30	1.00	2.09	0.15	0.0005	2.93		X	
Mercury	RADSL001	High	0.11	0.07	0.11	0.01	1.60	0.003	0.01	1.00	2.09	0.01	0.02	0.08	X		
Nickel	RADSBA07	High	0.11	0.48	0.11	0.05	140.00	0.003	0.49	1.00	2.09	0.26	0.35	13.41	X		
Selenium	OSLS001	High	0.11	0.49	0.11	0.05	1.20	0.003	0.004	1.00	2.09	0.03	0.11	0.43	X		
Zinc	RADSBA07	High	0.11	20.40	0.11	2.14	496.00	0.003	1.72	1.00	2.09	1.85	6.87	68.73	X		
Total DDTs[c]	RADSB001	High	0.11	0.02	0.11	0.002	0.01	0.003	0.00002	1.00	2.09	0.001	0.01	0.63	X		
Arsenic	RADSB006	Low	0.09	0.12	0.09	0.01	47.20	0.003	0.15	0.75	2.48	0.05	2.70	10.80	X		
Copper	RADSBA07	Low	0.09	1.20	0.09	0.11	272.00	0.003	0.84	0.75	2.48	0.29	0.62	8.94	X		
Lead	RADSBA02	Low	0.09	0.07	0.09	0.01	182.00	0.003	0.56	0.75	2.48	0.17	0.0005	2.93		X	
	95 UCL[d]	Low	0.09	0.07	0.09	0.01	87.40	0.003	0.27	0.75	2.48	0.08	0.0005	2.93		X	
Mercury	RADSL001	Low	0.09	0.07	0.09	0.01	1.60	0.003	0.005	0.75	2.48	0.003	0.02	0.08	X		
Nickel	RADSBA07	Low	0.09	0.48	0.09	0.05	140.00	0.003	0.43	0.75	2.48	0.14	0.35	13.41	X		
Selenium	OSLS001	Low	0.09	0.49	0.09	0.05	1.20	0.003	0.004	0.75	2.48	0.02	0.11	0.43	X		
Zinc	RADSBA07	Low	0.09	20.40	0.09	1.92	496.00	0.003	1.54	0.75	2.48	1.05	6.87	68.73	X		
Total DDTs[c]	RADSB001	Low	0.09	0.02	0.09	0.002	0.01	0.003	0.00002	0.75	2.48	0.001	0.01	0.63	X		
Lead	RADSBA02	Typical	0.10	0.07	0.10	0.01	182.00	0.003	0.60	1.00	2.39	0.25	0.0005	2.93		X	
	95 UCL[d]	Typical	0.10	0.07	0.10	0.01	87.40	0.003	0.29	1.00	2.39	0.12	0.0005	2.93		X	
Arsenic	---	Ambient Hi	0.11	NA	0.11	NA	15.30	0.003	0.05	1.00	2.09	0.03	2.70	10.80	X		
Copper	---	Ambient Hi	0.11	NA	0.11	NA	68.10	0.003	0.24	1.00	2.09	0.11	0.62	8.94	X		
Lead	---	Ambient Hi	0.11	NA	0.11	NA	43.20	0.003	0.15	1.00	2.09	0.07	0.0005	2.93		X	
Mercury	---	Ambient Hi	0.11	NA	0.11	NA	0.43	0.003	0.001	1.00	2.09	0.001	0.02	0.08	X		
Nickel	---	Ambient Hi	0.11	NA	0.11	NA	112.00	0.003	0.39	1.00	2.09	0.19	0.35	13.41	X		
Selenium	---	Ambient Hi	0.11	NA	0.11	NA	0.64	0.003	0.002	1.00	2.09	0.001	0.11	0.43	X		
Zinc	---	Ambient Hi	0.11	NA	0.11	NA	158.00	0.003	0.55	1.00	2.09	0.26	6.87	68.73	X		
Arsenic	---	Ambient Lo	0.09	NA	0.09	NA	15.30	0.003	0.05	0.75	2.48	0.01	2.70	10.80	X		
Copper	---	Ambient Lo	0.09	NA	0.09	NA	68.10	0.003	0.21	0.75	2.48	0.06	0.62	8.94	X		
Lead	---	Ambient Lo	0.09	NA	0.09	NA	43.20	0.003	0.13	0.75	2.48	0.04	0.0005	2.93		X	
Mercury	---	Ambient Lo	0.09	NA	0.09	NA	0.43	0.003	0.001	0.75	2.48	0.0004	0.02	0.08	X		
Nickel	---	Ambient Lo	0.09	NA	0.09	NA	112.00	0.003	0.35	0.75	2.48	0.11	0.35	13.41			

TABLE T7-1

GREAT BLUE HERON DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 3.3%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose[b] (mg/kg day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Selenium	---	Ambient Lo	0.09	NA	0.09	NA	0.64	0.003	0.002	0.75	2.48	0.001	0.11	0.43	X		
Zinc	---	Ambient Lo	0.09	NA	0.09	NA	158.00	0.003	0.49	0.75	2.48	0.15	6.87	68.73	X		
Lead	---	Amb Typical	0.10	NA	0.10	NA	43.20	0.003	0.14	1.00	2.39	0.06	0.0005	2.93		X	

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th ambient value
BW Body weight
DDT Dichlorodiphenyltrichloroethane
[fish] Concentration of chemical in fish
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b Point doses were calculated for each sample location
c Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
d The dose for the 95 percent upper cofidence limit was only calculated for chemicals with an HQ greater than 1
--- Not applicable to the analysis

TABLE T7-2

GREAT BLUE HERON HAZARD QUOTIENT CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	RADSBA07	0.08	0.05	NA	2.70	10.80	0.004	0.03	0.01	NA	NA
Selenium	OS1S001	0.03	0.02	NA	0.11	0.43	0.03	0.25	0.06	NA	NA
Copper	RADSBA07	0.51	0.29	NA	0.62	8.94	0.03	0.83	0.06	NA	NA
Lead	RADSBA02	0.31	0.17	0.25	0.0005	2.93	0.06	**622.97**	0.10	**516.23**	0.0002
	95 UCL[a]	0.15	0.08	0.12	0.0005	2.93	0.03	**302.89**	0.05	**251.00**	0.0002
Mercury	RADSL001	0.006	0.003	NA	0.02	0.08	0.05	0.38	0.08	NA	NA
Nickel	RADSBA07	0.26	0.14	NA	0.35	13.41	0.01	0.72	0.02	NA	NA
Zinc	RADSBA07	1.85	1.05	NA	6.87	68.73	0.02	0.27	0.03	NA	NA
Total DDTs[b]	RADSB001	0.001	0.001	NA	0.01	0.63	0.0008	0.07	0.001	NA	NA
Arsenic	Ambient[c]	0.03	0.01	NA	2.70	10.8	0.001	0.009	0.002	NA	NA
Selenium	Ambient[c]	0.001	0.001	NA	0.11	0.43	0.001	0.010	0.002	NA	NA
Copper	Ambient[c]	0.11	0.06	NA	0.62	8.94	0.007	0.18	0.013	NA	NA
Lead	Ambient[c]	0.07	0.04	0.06	0.0005	2.93	0.01	**146.17**	0.02	**121.12**	0.0002
Mercury	Ambient[c]	0.0007	0.0004	NA	0.02	0.08	0.005	0.044	0.009	NA	NA
Nickel	Ambient[c]	0.19	0.11	NA	0.35	13.41	0.008	0.52	0.01	NA	NA
Zinc	Ambient[c]	0.26	0.15	NA	6.87	68.73	0.002	0.04	0.004	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
TRV Toxicity reference value
UCL Upper confidence limit

a The dose for the 95 percent upper cofidence limit was only calculated for chemicals with an HQ greater than 1
b Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
c The Tidal Area 99th percent ambient value

TABLE T7-3

CALIFORNIA BLACK RAIL DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[clam] (mg/kg)	IR_{clam} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 18%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	RADSBA07	High	0.01	0.61	0.01	0.005	47.20	0.001	0.07	1.00	0.02	3.48	204.70	819.05	X		
Copper	RADSBA07	High	0.01	5.00	0.01	0.04	272.00	0.001	0.38	1.00	0.02	20.61	46.66	678.60	X		
Lead	RADSBA02	High	0.01	0.66	0.01	0.01	182.00	0.001	0.26	1.00	0.02	12.76	0.04	222.22		X	
	95 UCL[b]	High	0.01	0.66	0.01	0.01	87.40	0.001	0.12	1.00	0.02	6.26	0.04	222.22		X	
Mercury	RADSB004	High	0.01	0.04	0.01	0.0003	1.60	0.001	0.002	1.00	0.02	0.13	1.24	5.71	X		
Nickel	RADSBA07	High	0.01	0.48	0.01	0.004	140.00	0.001	0.20	1.00	0.02	9.81	26.89	1017.50	X		
Selenium	OSLS001	High	0.01	0.58	0.01	0.005	1.20	0.001	0.002	1.00	0.02	0.30	8.09	79.47	X		
Zinc	RADSBA07	High	0.01	16.40	0.01	0.13	496.00	0.001	0.70	1.00	0.02	40.36	521.50	5215.00	X		
DDE	RADSB002	High	0.01	0.01	0.01	0.0001	0.01	0.001	0.00001	1.00	0.02	0.01	NA	19.05	X		
Total DDTs[c]	RADSB001	High	0.01	0.02	0.01	0.0002	0.01	0.001	0.00001	1.00	0.02	0.01	1.00	47.62	X		
Arsenic	RADSBA07	Low	0.005	0.61	0.005	0.003	47.20	0.001	0.04	1.00	0.05	0.92	204.70	819.05	X		
Copper	RADSBA07	Low	0.005	5.00	0.005	0.02	272.00	0.001	0.23	1.00	0.05	5.43	46.66	678.60	X		
Lead	RADSBA02	Low	0.005	0.66	0.005	0.003	182.00	0.001	0.15	1.00	0.05	3.36	0.04	222.22		X	
	95 UCL[b]	Low	0.005	0.66	0.005	0.003	87.40	0.001	0.07	1.00	0.05	1.65	0.04	222.22		X	
Mercury	RADSB004	Low	0.005	0.04	0.005	0.0002	1.60	0.001	0.001	1.00	0.05	0.03	1.24	5.71	X		
Nickel	RADSBA07	Low	0.005	0.48	0.005	0.002	140.00	0.001	0.12	1.00	0.05	2.58	26.89	1017.50	X		
Selenium	OSLS001	Low	0.005	0.58	0.005	0.003	1.20	0.001	0.001	1.00	0.05	0.08	8.09	79.47	X		
Zinc	RADSBA07	Low	0.005	16.40	0.005	0.08	496.00	0.001	0.41	1.00	0.05	10.64	521.50	5215.00	X		
DDE	RADSB002	Low	0.005	0.01	0.005	0.0001	0.01	0.001	0.00001	1.00	0.05	0.002	NA	19.05	X		
Total DDTs[c]	RADSB001	Low	0.005	0.02	0.005	0.0001	0.01	0.001	0.00001	1.00	0.05	0.002	1.00	47.62	X		
Lead	RADSBA02	Typical	0.01	0.66	0.01	0.004	182.00	0.001	0.20	1.00	0.03	6.61	0.04	222.22		X	
	95 UCL[b]	Typical	0.01	0.66	0.01	0.004	87.40	0.001	0.10	1.00	0.03	3.24	0.04	222.22		X	
Arsenic	---	Ambient Hi	0.01	NA	0.01	NA	15.30	0.001	0.02	1.00	0.02	1.05	204.70	819.05	X		
Copper	---	Ambient Hi	0.01	NA	0.01	NA	68.10	0.001	0.10	1.00	0.02	4.68	46.66	678.60	X		
Lead	---	Ambient Hi	0.01	NA	0.01	NA	43.20	0.001	0.06	1.00	0.02	2.97	0.04	222.22		X	
Mercury	---	Ambient Hi	0.01	NA	0.01	NA	0.43	0.001	0.001	1.00	0.02	0.03	1.24	5.71	X		
Nickel	---	Ambient Hi	0.01	NA	0.01	NA	112.00	0.001	0.16	1.00	0.02	7.70	26.89	1017.50	X		
Selenium	---	Ambient Hi	0.01	NA	0.01	NA	0.64	0.001	0.0009	1.00	0.02	0.04	8.09	79.47	X		
Zinc	---	Ambient Hi	0.01	NA	0.01	NA	158.00	0.001	0.22	1.00	0.02	10.86	521.50	5215.00	X		
Total DDTs[c]	---	Ambient Hi	0.01	NA	0.01	NA	0.01	0.001	0.00001	1.00	0.02	0.0005	1.00	47.62	X		
Arsenic	---	Ambient Lo	0.005	NA	0.005	NA	15.30	0.001	0.01	1.00	0.05	0.28	204.70	819.05	X		
Copper	---	Ambient Lo	0.005	NA	0.005	NA	68.10	0.001	0.06	1.00	0.05	1.23	46.66	678.60	X		

TABLE T7-3

CALIFORNIA BLACK RAIL DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[clam] (mg/kg)	IR_{clam} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 18%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Lead	---	Ambient Lo	0.005	NA	0.005	NA	43.20	0.001	0.04	1.00	0.05	0.78	0.04	222.22		X	
Mercury	---	Ambient Lo	0.005	NA	0.005	NA	0.43	0.001	0.0004	1.00	0.05	0.01	1.24	5.71	X		
Nickel	---	Ambient Lo	0.005	NA	0.005	NA	112.00	0.001	0.09	1.00	0.05	2.03	26.89	1017.50	X		
Selenium	---	Ambient Lo	0.005	NA	0.005	NA	0.64	0.001	0.001	1.00	0.05	0.01	8.09	79.47	X		
Zinc	---	Ambient Lo	0.005	NA	0.005	NA	158.00	0.001	0.13	1.00	0.05	2.86	521.50	5215.00	X		
Total DDTs[c]	---	Ambient Lo	0.005	NA	0.005	NA	0.01	0.001	0.00001	1.00	0.05	0.0001	1.00	47.62	X		
Lead	---	Amb Typical	0.01	NA	0.01	NA	43.20	0.001	0.05	1.00	0.03	1.54	0.04	222.22		X	

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th percent ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th percent ambient value
BW Body weight
[clam] Concentration of chemical in clam
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of sediment
kg/day Kilograms per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b The HQ for the 95UCL was only calculated for chemicals with an HQ greater than 1
c Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
--- Not applicable to the analysis

TABLE T7-4
CALIFORNIA BLACK RAIL HAZARD QUOTIENT CALCULATIONS
IN THE NORTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	RADSBA07	3.48	0.92	NA	204.70	819.05	0.001	0.02	0.004	NA	NA
Copper	RADSBA07	20.61	5.43	NA	46.66	678.60	0.01	0.44	0.03	NA	NA
Lead	RADSBA02	12.76	3.36	6.61	0.04	222.22	0.02	**342.22**	0.06	**177.20**	0.03
	95 UCL[a]	6.26	1.65	3.24	0.04	222.22	0.01	**167.85**	0.03	**86.92**	0.01
Mercury	RADSB004	0.13	0.03	NA	1.24	5.71	0.01	0.10	0.02	NA	NA
Nickel	RADSB005	9.81	2.58	NA	26.89	1017.50	0.003	0.36	0.01	NA	NA
Selenium	OSLS001	0.30	0.08	NA	8.09	79.47	0.001	0.04	0.004	NA	NA
Zinc	RADSBA07	40.36	10.64	NA	521.50	5215.00	0.002	0.08	0.01	NA	NA
DDE	RADSB002	0.01	0.002	NA	NA	19.05	0.0001	NA	0.0003	NA	NA
Total DDTs[b]	RADSB001	0.01	0.002	NA	1.00	47.62	0.0001	0.01	0.0002	NA	NA
Arsenic	Ambient[c]	1.05	0.28	NA	204.70	819.05	0.0003	0.01	0.001	NA	NA
Copper	Ambient[c]	4.68	1.23	NA	46.66	678.60	0.002	0.10	0.01	NA	NA
Lead	Ambient[c]	2.97	0.78	1.54	0.04	222.22	0.004	**79.63**	0.01	**41.23**	0.01
Mercury	Ambient[c]	0.03	0.01	NA	1.24	5.71	0.001	0.02	0.01	NA	NA
Nickel	Ambient[c]	7.70	2.03	NA	26.89	1017.50	0.002	0.29	0.01	NA	NA
Selenium	Ambient[c]	0.04	0.01	NA	8.09	79.47	0.0001	0.01	0.001	NA	NA
Zinc	Ambient[c]	10.86	2.86	NA	521.50	5215.00	0.0005	0.02	0.002	NA	NA
Total DDTs[b]	Ambient[c]	0.0005	0.0001	NA	1.00	47.62	0.000003	0.0005	0.00001	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

DDE Dichlorodiphenyldichloroethene

DDT Dichlorodiphenyltrichloroethane

HQ Hazard quotient

mg/kg/day Milligrams per kilogram per day

TRV Toxicity reference value

UCL Upper confidence limit

a The HQ for the 95UCL was only calculated for chemicals with an HQ > 1

b Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT

c The Tidal Area 99th percent ambient value

TABLE T7-5
RIVER OTTER DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (50% IR_{prey})	[clam] (mg/kg)	IR_{clam} (kg/day) (50% IR_{prey})	Ingestion from Aquatic Prey (mg/d)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 1.0%	Ingestion from Sediment (mg/d)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Arsenic	RADSBA07	High	0.47	0.12	0.23	0.61	0.23	0.17	47.20	0.005	0.22	0.50	4.74	0.04	0.14	1.60	X		
Copper	RADSBA07	High	0.47	1.20	0.23	5.00	0.23	1.44	272.00	0.005	1.26	0.50	4.74	0.29	0.66	148.00	X		
Lead	RADSBA02	High	0.47	0.07	0.23	0.66	0.23	0.17	182.00	0.005	0.85	0.50	4.74	0.11	0.001	52.61		X	
	95 UCL[b]	High	0.47	0.07	0.23	0.66	0.23	0.17	87.40	0.005	0.41	0.50	4.74	0.06	0.001	52.61		X	
Mercury	RADSB004	High	0.47	0.07	0.23	0.04	0.23	0.03	1.60	0.005	0.01	0.50	4.74	0.003	0.02	0.15	X		
Nickel	RADSBA07	High	0.47	0.48	0.23	0.48	0.23	0.22	140.00	0.005	0.65	0.50	4.74	0.09	0.06	13.19		X	
	95 UCL[b]	High	0.47	0.48	0.23	0.48	0.23	0.22	87.10	0.005	0.41	0.50	4.74	0.07	0.06	13.19		X	
Selenium	OSLS001	High	0.47	0.49	0.23	0.58	0.23	0.25	1.20	0.005	0.01	0.50	4.74	0.03	0.02	0.28		X	
	95 UCL[b]	High	0.47	0.49	0.23	0.58	0.23	0.25	1.10	0.005	0.01	0.50	4.74	0.03	0.02	0.28		X	
Zinc	RADSBA07	High	0.47	20.40	0.23	16.40	0.23	8.56	496.00	0.005	2.31	0.50	4.74	1.15	2.27	157.33	X		
Chlordane	RADSBA07	High	0.47	0.002	0.23	0.001	0.23	0.001	0.001	0.005	0.00001	0.50	4.74	0.000	0.04	1.95	X		
DDE	RADSB002	High	0.47	0.01	0.23	0.01	0.23	0.005	0.01	0.005	0.00003	0.50	4.74	0.001	NA	0.36	X		
Total DDTs[c]	RADSB001	High	0.47	0.02	0.23	0.02	0.23	0.01	0.01	0.005	0.00003	0.50	4.74	0.001	0.01	0.89	X		
Naphthalene	RADSB001	High	0.47	NA	0.23	NA	0.23	NA	0.21	0.005	0.001	0.50	4.74	0.0001	21.44	63.94	X		
Arsenic	RADSBA07	Low	0.25	0.12	0.12	0.61	0.12	0.09	47.20	0.002	0.12	0.25	10.42	0.005	0.14	1.60	X		
Copper	RADSBA07	Low	0.25	1.20	0.12	5.00	0.12	0.77	272.00	0.002	0.67	0.25	10.42	0.03	0.66	148.00	X		
Lead	RADSBA02	Low	0.25	0.07	0.12	0.66	0.12	0.09	182.00	0.002	0.45	0.25	10.42	0.01	0.001	52.61		X	
	95 UCL[b]	Low	0.25	0.07	0.12	0.66	0.12	0.09	87.40	0.002	0.22	0.25	10.42	0.01	0.001	52.61		X	
Mercury	RADSB004	Low	0.25	0.07	0.12	0.04	0.12	0.01	1.60	0.002	0.004	0.25	10.42	0.0004	0.02	0.15	X		
Nickel	RADSBA07	Low	0.25	0.48	0.12	0.48	0.12	0.12	140.00	0.002	0.35	0.25	10.42	0.01	0.06	13.19	X		
	95 UCL[b]	Low	0.25	0.48	0.12	0.48	0.12	0.12	87.10	0.002	0.22	0.25	10.42	0.01	0.06	13.19	X		
Selenium	OSLSL001	Low	0.25	0.49	0.12	0.58	0.12	0.13	1.20	0.002	0.003	0.25	10.42	0.003	0.02	0.28	X		
	95 UCL[b]	Low	0.25	0.49	0.12	0.58	0.12	0.13	1.10	0.002	0.003	0.25	10.42	0.003	0.02	0.28	X		
Zinc	RADSBA07	Low	0.25	20.40	0.12	16.40	0.12	4.54	496.00	0.002	1.23	0.25	10.42	0.14	2.27	157.33	X		
Chlordane	RADSBA07	Low	0.25	0.002	0.12	0.001	0.12	0.0005	0.001	0.002	0.000003	0.25	10.42	0.00001	0.04	1.95	X		
DDE	RADSB002	Low	0.25	0.01	0.12	0.01	0.12	0.003	0.01	0.002	0.00002	0.25	10.42	0.0001	NA	0.36	X		
Total DDTs[c]	RADSB001	Low	0.25	0.02	0.12	0.02	0.12	0.01	0.01	0.002	0.00002	0.25	10.42	0.0001	0.01	0.89	X		
Naphthalene	RADSB001	Low	0.25	NA	0.12	NA	0.12	NA	0.21	0.002	0.001	0.25	10.42	0.00001	21.44	63.94	X		
Lead	RADSBA02	Typical	0.36	0.07	0.18	0.66	0.18	0.13	182.00	0.004	0.65	0.50	8.18	0.05	0.001	52.61		X	
	95 UCL[b]	Typical	0.36	0.07	0.18	0.66	0.18	0.13	87.40	0.004	0.31	0.50	8.18	0.03	0.001	52.61		X	
Nickel	RADSBA07	Typical	0.36	0.48	0.18	0.48	0.18	0.17	140.00	0.004	0.50	0.50	8.18	0.04	0.06	13.19	X		
	95 UCL[b]	Typical	0.36	0.48	0.18	0.48	0.18	0.17	87.40	0.004	0.31	0.50	8.18	0.03	0.06	13.19	X		
Selenium	OSLSL001	Typical	0.36	0.49	0.18	0.58	0.18	0.19	1.20	0.004	0.004	0.50	8.18	0.01	0.02	0.28	X		
	95 UCL[b]	Typical	0.36	0.49	0.18	0.58	0.18	0.19	1.10	0.004	0.004	0.50	8.18	0.01	0.02	0.28	X		
Arsenic	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	15.30	0.005	0.07	0.50	4.74	0.01	0.14	1.60	X		
Copper	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	68.10	0.005	0.32	0.50	4.74	0.03	0.66	148.00	X		
Lead	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	43.20	0.005	0.20	0.50	4.74	0.02	0.001	52.61		X	
Mercury	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	0.43	0.005	0.002	0.50	4.74	0.0002	0.02	0.15	X		

TABLE T7-5
RIVER OTTER DOSE CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (50% IR_{prey})	[clam] (mg/kg)	IR_{clam} (kg/day) (50% IR_{prey})	Ingestion from Aquatic Prey (mg/d)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 1.0%	Ingestion from Sediment (mg/d)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Nickel	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	112.00	0.005	0.52	0.50	4.74	0.05	0.06	13.19	X		
Selenium	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	0.64	0.005	0.003	0.50	4.74	0.0003	0.02	0.28	X		
Zinc	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	158.00	0.005	0.73	0.50	4.74	0.08	2.27	157.33	X		
DDE	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	0.01	0.005	0.00003	0.50	4.74	0.000003	NA	0.36	X		
Total DDTs[c]	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	0.01	0.005	0.00003	0.50	4.74	0.000003	0.01	0.89	X		
Arsenic	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	15.30	0.002	0.04	0.25	10.42	0.001	0.14	1.60	X		
Copper	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	68.10	0.002	0.17	0.25	10.42	0.004	0.66	148.00	X		
Lead	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	43.20	0.002	0.11	0.25	10.42	0.003	0.001	52.61		X	
Mercury	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	0.43	0.002	0.001	0.25	10.42	0.00003	0.02	0.15	X		
Nickel	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	112.00	0.002	0.28	0.25	10.42	0.01	0.06	13.19	X		
Selenium	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	0.64	0.002	0.002	0.25	10.42	0.00004	0.02	0.28	X		
Zinc	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	158.00	0.002	0.390	0.25	10.42	0.01	2.27	157.33	X		
DDE	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	0.01	0.002	0.00002	0.25	10.42	0.0000004	NA	0.36	X		
Total DDTs[c]	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	0.01	0.002	0.00002	0.25	10.42	0.0000004	0.01	0.89	X		
Lead	---	Amb Typical	0.36	NA	0.18	NA	0.18	NA	43.20	0.004	0.15	0.50	8.18	0.01	0.001	52.61		X	
Nickel	---	Amb Typical	0.36	NA	0.18	NA	0.18	NA	112.00	0.004	0.40	0.50	8.18	0.02	0.06	13.19	X		
Selenium	---	Amb Typical	0.36	NA	0.18	NA	0.18	NA	0.64	0.004	0.002	0.50	8.18	0.0001	0.02	0.28	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th percent ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th percent ambient value
BW Body weight
[clam] Concentration of chemical in clam
DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
[fish] Concentration of chemical in fish
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of soil

kg/day Kilograms per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1
c Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
--- Not applicable to the analysis

TABLE T7-6

RIVER OTTER HAZARD QUOTIENT CALCULATIONS IN THE NORTH OTTER SLUICE AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Arsenic	RADSBA07	0.04	0.005	NA	0.14	1.60	0.003	0.29	0.03	NA	NA
Copper	RADSBA07	0.29	0.03	NA	0.66	148.00	0.0002	0.43	0.002	NA	NA
Lead	RADSBA02	0.11	0.01	0.05	0.001	52.61	0.0002	**178.63**	0.002	**79.21**	0.001
	95 UCL[a]	0.06	0.01	0.03	0.001	52.61	0.0001	**101.29**	0.001	**44.91**	0.001
Mercury	RADSB004	0.003	0.0004	NA	0.02	0.15	0.003	0.23	0.02	NA	NA
Nickel	RADSBA07	0.09	0.01	0.04	0.06	13.19	0.001	**1.66**	0.01	0.74	0.003
	95 UCL[a]	0.07	0.01	0.03	0.06	13.19	0.001	**1.19**	0.01	0.53	0.002
Selenium	OSLS001	0.03	0.003	0.01	0.02	0.28	0.01	**1.38**	0.09	0.61	0.04
	95 UCL[a]	0.03	0.003	0.01	0.02	0.28	0.01	1.38	0.09	0.61	0.04
Zinc	RADSBA07	1.15	0.14	NA	2.27	157.33	0.001	0.50	0.01	NA	NA
Chlordanes	RADSBA07	0.0001	0.00001	NA	0.04	1.95	0.00001	0.002	0.00005	NA	NA
DDE	RADSB002	0.001	0.0001	NA	NA	0.36	0.0002	NA	0.001	NA	NA
Total DDTs[b]	RADSB001	0.001	0.0001	NA	0.01	0.89	0.0001	0.14	0.001	NA	NA
Naphthalene	RADSB001	0.0001	0.00001	NA	21.44	63.94	0.0000002	0.000005	0.000002	NA	NA
Arsenic	Ambient[c]	0.01	0.001	NA	0.14	1.60	0.001	0.05	0.005	NA	NA
Copper	Ambient[c]	0.03	0.004	NA	0.66	148.00	0.00003	0.05	0.0002	NA	NA
Lead	Ambient[c]	0.02	0.003	0.01	0.001	52.61	0.00005	**35.32**	0.0004	**15.66**	0.0002
Mercury	Ambient[c]	0.0002	0.00003	NA	0.02	0.15	0.0002	0.01	0.001	NA	NA
Nickel	Ambient[c]	0.05	0.01	0.02	0.06	13.19	0.0005	0.99	0.004	0.44	0.002
Selenium	Ambient[c]	0.0003	0.00004	0.00	0.02	0.28	0.0001	0.02	0.001	0.01	0.0005
Zinc	Ambient[c]	0.08	0.01	NA	2.27	157.33	0.00006	0.03	0.0005	NA	NA
DDE	Ambient[c]	0.000003	0.0000004	NA	NA	0.36	0.000001	NA	0.00001	NA	NA
Total DDTs[b]	Ambient[c]	0.000003	0.0000005	NA	0.01	0.89	0.000001	0.0005	0.000004	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
NA Not available
TRV Toxicity reference value
UCL Upper confidence limit

a The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1
b Total DDTs are the sum of dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethene, and DDT
c The Tidal Area 99th percent ambient value

TABLE T7-7

GREAT BLUE HERON DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 3.3%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose[b] (mg/kg day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Cadmium	WHSSB002	High	0.11	0.01	0.11	0.001	4.20	0.003	0.01	1.00	2.09	0.01	0.03	0.37	X		
Copper	WHSSBA02	High	0.11	2.20	0.11	0.23	105.00	0.003	0.36	1.00	2.09	0.28	0.62	8.94	X		
Lead	WHSSB002	High	0.11	0.07	0.11	0.01	99.50	0.003	0.34	1.00	2.09	0.17	0.0005	2.93		X	
	95 UCL[c]	High	0.11	0.07	0.11	0.01	60.90	0.003	0.21	1.00	2.09	0.10	0.0005	2.93		X	
Mercury	WHSSB022	High	0.11	0.10	0.11	0.01	18.50	0.003	0.06	1.00	2.09	0.04	0.02	0.08		X	
	WHSSBB05	High	0.11	0.10	0.11	0.01	0.82	0.003	0.003	1.00	2.09	0.01	0.02	0.08	X		
Nickel	WHSSB001	High	0.11	0.08	0.11	0.01	123.00	0.003	0.43	1.00	2.09	0.21	0.35	13.41	X		
Selenium	WHSSB001	High	0.11	0.52	0.11	0.05	3.50	0.003	0.01	1.00	2.09	0.03	0.11	0.43	X		
Zinc	WHSSB002	High	0.11	26.40	0.11	2.77	605.00	0.003	2.10	1.00	2.09	2.33	6.87	68.73	X		
Total PCBs	OSLSL008	High	0.11	0.01	0.11	0.001	0.02	0.003	0.0001	1.00	2.09	0.001	0.03	0.91	X		
Cadmium	WHSSB002	Low	0.09	0.01	0.09	0.001	4.20	0.003	0.01	1.00	2.48	0.01	0.03	0.37	X		
Copper	WHSSBA02	Low	0.09	2.20	0.09	0.21	105.00	0.003	0.33	0.75	2.48	0.16	0.62	8.94	X		
Lead	WHSSB002	Low	0.09	0.07	0.09	0.01	99.50	0.003	0.31	0.75	2.48	0.10	0.0005	2.93		X	
	95 UCL[c]	Low	0.09	0.07	0.09	0.01	60.90	0.003	0.19	0.75	2.48	0.06	0.0005	2.93		X	
Mercury	WHSSB022	Low	0.09	0.10	0.09	0.01	18.50	0.003	0.06	0.75	2.48	0.02	0.02	0.08		X	
	WHSSBB05	Low	0.09	0.10	0.09	0.01	0.82	0.003	0.00	0.75	2.48	0.004	0.02	0.08	X		
Nickel	WHSSB001	Low	0.09	0.08	0.09	0.01	123.00	0.003	0.38	0.75	2.48	0.12	0.35	13.41	X		
Selenium	WHSSB001	Low	0.09	0.52	0.09	0.05	3.50	0.003	0.01	0.75	2.48	0.02	0.11	0.43	X		
Zinc	WHSSB002	Low	0.09	26.40	0.09	2.48	605.00	0.003	1.88	0.75	2.48	1.32	6.87	68.73	X		
Total PCBs	OSLSL008	Low	0.09	0.01	0.09	0.001	0.02	0.003	0.0001	0.75	2.48	0.0004	0.03	0.91	X		
Lead	WHSSB002	Typical	0.10	0.07	0.10	0.01	99.50	0.003	0.33	1.00	2.39	0.14	0.0005	2.93		X	
	95 UCL[c]	Typical	0.10	0.07	0.10	0.01	60.90	0.003	0.20	1.00	2.39	0.09	0.0005	2.93		X	
Mercury	WHSSB022	Typical	0.10	0.10	0.10	0.01	18.50	0.003	0.06	1.00	2.39	0.03	0.02	0.08		X	
Cadmium	---	Ambient Hi	0.11	NA	0.11	NA	0.33	0.003	0.001	1.00	2.09	0.0005	0.03	0.37	X		
Copper	---	Ambient Hi	0.11	NA	0.11	NA	68.10	0.003	0.24	1.00	2.09	0.11	0.62	8.94	X		
Lead	---	Ambient Hi	0.11	NA	0.11	NA	43.20	0.003	0.15	1.00	2.09	0.07	0.0005	2.93		X	
Mercury	---	Ambient Hi	0.11	NA	0.11	NA	0.43	0.003	0.001	1.00	2.09	0.0007	0.02	0.08	X		
	---	Ambient Hi	0.10	NA	0.11	NA	0.43	0.003	0.001	1.00	2.39	0.0006	0.02	0.08	X		
Nickel	---	Ambient Hi	0.11	NA	0.11	NA	112.00	0.003	0.39	1.00	2.09	0.19	0.35	13.41			
Selenium	---	Ambient Hi	0.11	NA	0.11	NA	0.64	0.003	0.002	1.00	2.09	0.001	0.11	0.43	X		
Zinc	---	Ambient Hi	0.11	NA	0.11	NA	158.00	0.003	0.55	1.00	2.09	0.26	6.87	68.73	X		
Cadmium	---	Ambient Lo	0.09	NA	0.09	NA	0.33	0.003	0.001	0.75	2.48	0.0003	0.03	0.37	X		
Copper	---	Ambient Lo	0.09	NA	0.09	NA	68.10	0.003	0.21	0.75	2.48	0.06	0.62	8.94	X		

TABLE T7-7

GREAT BLUE HERON DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 3.3%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose[b] (mg/kg day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Lead	---	Ambient Lo	0.09	NA	0.09	NA	43.20	0.003	0.13	0.75	2.48	0.04	0.0005	2.93		X	
Mercury	---	Ambient Lo	0.09	NA	0.09	NA	0.43	0.003	0.00	0.75	2.48	0.0004	0.02	0.08	X		
Nickel	---	Ambient Lo	0.09	NA	0.09	NA	112.00	0.003	0.35	0.75	2.48	0.11	0.35	13.41			
Selenium	---	Ambient Lo	0.09	NA	0.09	NA	0.64	0.003	0.002	0.75	2.48	0.0006	0.11	0.43	X		
Zinc	---	Ambient Lo	0.09	NA	0.09	NA	158.00	0.003	0.49	0.75	2.48	0.15	6.87	68.73	X		
Lead	---	Amb Typical	0.10	NA	0.10	NA	43.20	0.003	0.14	1.00	2.39	0.06	0.0005	2.93		X	

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th ambient value
BW Body weight
[fish] Concentration of chemical in fish
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of soil
kg/day Kilograms per day
mg/d Milligrams per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b Point doses were calculated for each sample location
c The dose for the 95 percent upper confidence limit was only calculated for chemicals with an HQ greater than 1
--- Not applicable to the analysis

TABLE T7-8

GREAT BLUE HERON HAZARD QUOTIENT CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Cadmium	WHSSB002	0.01	0.01	NA	0.03	0.37	0.02	0.28	0.02	NA	NA
Copper	WHSSBA02	0.28	0.16	NA	0.62	8.94	0.02	0.46	0.03	NA	NA
	WHSSB002	0.28	0.16	NA	0.62	8.94	0.02	0.46	0.03	NA	NA
Lead	WHSSB002	0.17	0.10	0.14	0.0005	2.93	0.03	**343.83**	0.06	**284.92**	0.05
	95 UCL[a]	0.10	0.06	0.09	0.0005	2.93	0.02	**213.23**	0.04	**176.70**	NA
Mercury	WHSSB022	0.04	0.02	0.03	0.02	0.08	0.27	**2.19**	0.47	**1.81**	0.39
	WHSSB001	0.01	0.003	NA	0.02	0.08	0.04	0.36	0.08	NA	NA
Nickel	WHSSB001	0.21	0.12	NA	0.35	13.41	0.01	0.52	0.01	NA	NA
Selenium	WHSSB001	0.03	0.02	NA	0.11	0.43	0.04	0.30	0.07	NA	NA
Zinc	WHSSB002	2.33	1.32	NA	6.87	68.73	0.02	0.34	0.03	NA	NA
Total PCBs	OSLSL008	0.001	0.0004	NA	0.03	0.91	0.0004	0.02	0.001	NA	NA
Cadmium	Ambient[b]	0.001	0.0003	NA	0.03	0.37	0.001	0.02	0.001	NA	NA
Copper	Ambient[b]	0.11	0.10	NA	0.62	8.94	0.01	0.18	0.01	NA	NA
Lead	Ambient[b]	0.07	0.04	0.06	0.0005	2.93	0.01	**146.17**	0.02	**127.07**	0.0002
Mercury	Ambient[b]	0.00	0.002	0.0006	0.02	0.08	0.03	0.04	0.01	0.04	NA
Nickel	Ambient[b]	0.19	0.11	NA	0.35	13.41	0.01	0.52	0.01	NA	NA
Selenium	Ambient[b]	0.001	0.01	NA	0.11	0.43	0.03	0.01	0.002	NA	NA
Zinc	Ambient[b]	0.26	0.73	NA	6.87	68.73	0.01	0.04	0.004	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

HQ Hazard quotient

mg/kg/day Milligrams per kilogram per day

NA Not available

PCB Polychlorinated biphenyl

TRV Toxicity reference value

a The dose for the 95 percent upper cofidence limit was only calculated for chemicals with an HQ greater than 1

b The Tidal Area 99th percent ambient value

TABLE T7-9

CALIFORNIA BLACK RAIL DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[clam] (mg/kg)	IR_{clam} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 18%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose[b] (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Cadmium	WHSSB002	High	0.01	0.11	0.01	0.001	4.20	0.001	0.01	1.00	0.02	0.33	2.03	27.81	X		
Copper	WHSSBA02	High	0.01	5.00	0.01	0.04	105.00	0.001	0.15	1.00	0.02	9.13	46.66	678.60	X		
Lead	WHSSB002	High	0.01	0.23	0.01	0.002	99.50	0.001	0.14	1.00	0.02	6.93	0.04	222.22		X	
	95 UCL[c]	High	0.01	0.23	0.01	0.002	60.90	0.001	0.09	1.00	0.02	4.27	0.04	222.22		X	
Mercury	WHSSB022	High	0.01	0.04	0.01	0.0003	18.50	0.001	0.03	1.00	0.02	1.29	1.24	5.71		X	
	WHSSBB05	High	0.01	0.04	0.01	0.0003	0.82	0.001	0.001	1.00	0.02	0.07	1.24	5.71	X		
Nickel	WHSSB001	High	0.01	0.55	0.01	0.004	123.00	0.001	0.17	1.00	0.02	8.67	26.89	1017.50			
Selenium	WHSSB001	High	0.01	0.51	0.01	0.004	3.50	0.001	0.005	1.00	0.02	0.44	8.09	79.47	X		
Zinc	WHSSB002	High	0.01	17.70	0.01	0.14	605.00	0.001	0.85	1.00	0.02	48.36	521.50	5215.00	X		
Total PCBs	OSLSL008	High	0.01	0.01	0.01	0.0001	0.02	0.001	0.00002	1.00	0.02	0.01	2.29	69.16	X		
Cadmium	WHSSB002	Low	0.005	0.11	0.005	0.001	4.20	0.001	0.004	1.00	0.05	0.09	2.03	27.81	X		
Copper	WHSSBA02	Low	0.005	5.00	0.005	0.02	105.00	0.001	0.09	1.00	0.05	2.41	46.66	678.60	X		
Lead	WHSSB002	Low	0.005	0.23	0.005	0.001	99.50	0.001	0.08	1.00	0.05	1.83	0.04	222.22		X	
	95 UCL[c]	Low	0.005	0.23	0.005	0.001	60.90	0.001	0.05	1.00	0.05	1.13	0.04	222.22		X	
Mercury	WHSSB022	Low	0.005	0.04	0.005	0.0002	18.50	0.001	0.02	1.00	0.05	0.34	1.24	5.71	X		
	WHSSBB05	Low	0.005	0.04	0.005	0.0002	0.82	0.001	0.001	1.00	0.05	0.02	1.24	5.71	X		
Nickel	WHSSB001	Low	0.005	0.55	0.005	0.003	123.00	0.001	0.10	1.00	0.05	2.28	26.89	1017.50			
Selenium	WHSSB001	Low	0.005	0.51	0.005	0.002	3.50	0.001	0.003	1.00	0.05	0.11	8.09	79.47	X		
Zinc	WHSSB002	Low	0.005	17.70	0.005	0.08	605.00	0.001	0.50	1.00	0.05	12.74	521.50	5215.00	X		
Total PCBs	OSLSL008	Low	0.005	0.01	0.005	0.0001	0.02	0.001	0.00001	1.00	0.05	0.002	2.29	69.16	X		
Lead	WHSSB002	Typical	0.01	0.23	0.01	0.001	99.50	0.001	0.11	1.00	0.03	3.59	0.04	222.22		X	
	95 UCL[c]	Typical	0.01	0.23	0.01	0.001	60.90	0.001	0.07	1.00	0.03	2.21	0.04	222.22		X	
Mercury	WHSSB022	Typical	0.01	0.04	0.01	0.0002	18.50	0.001	0.02	1.00	0.03	0.67	1.24	5.71	X		
Cadmium	---	Ambient Hi	0.01	NA	0.01	NA	0.33	0.001	0.0005	1.00	0.02	0.02	2.03	27.81	X		
Copper	---	Ambient Hi	0.01	NA	0.01	NA	68.10	0.001	0.10	1.00	0.02	4.68	46.66	678.60	X		
Lead	---	Ambient Hi	0.01	NA	0.01	NA	43.20	0.001	0.06	1.00	0.02	2.97	0.04	222.22		X	
Mercury	---	Ambient Hi	0.01	NA	0.01	NA	0.32	0.001	0.0005	1.00	0.02	0.02	1.24	5.71	X		
Nickel	---	Ambient Hi	0.01	NA	0.01	NA	112.00	0.001	0.16	1.00	0.02	7.70	26.89	1017.50	X		
Selenium	---	Ambient Hi	0.01	NA	0.01	NA	0.64	0.001	0.001	1.00	0.02	0.04	8.09	79.47	X		
Zinc	---	Ambient Hi	0.01	NA	0.01	NA	158.00	0.001	0.22	1.00	0.02	10.86	521.50	5215.00	X		
Total PCBs	---	Ambient Hi	0.01	NA	0.01	NA	14.80	0.001	0.02	1.00	0.02	1.02	2.29	69.16	X		
Cadmium	---	Ambient Lo	0.005	NA	0.005	NA	0.33	0.001	0.0003	1.00	0.05	0.01	2.03	27.81	X		
Copper	---	Ambient Lo	0.005	NA	0.005	NA	68.10	0.001	0.06	1.00	0.05	1.23	46.66	678.60	X		
Lead	---	Ambient Lo	0.005	NA	0.005	NA	43.20	0.001	0.04	1.00	0.05	0.78	0.04	222.22		X	
Mercury	---	Ambient Lo	0.005	NA	0.005	NA	0.32	0.001	0.0003	1.00	0.05	0.01	1.24	5.71	X		

TABLE T7-9

CALIFORNIA BLACK RAIL DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[clam] (mg/kg)	IR_{clam} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (mg/day)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 18%	Ingestion from Sediment (mg/day)	SUF	BW (kg)	Dose[b] (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Nickel	---	Ambient Lo	0.005	NA	0.005	NA	112.00	0.001	0.09	1.00	0.05	2.03	26.89	1017.50	X		
Selenium	---	Ambient Lo	0.005	NA	0.005	NA	0.64	0.001	0.001	1.00	0.05	0.01	8.09	79.47	X		
Zinc	---	Ambient Lo	0.005	NA	0.005	NA	158.00	0.001	0.13	1.00	0.05	2.86	521.50	5215.00	X		
Total PCBs	---	Ambient Lo	0.005	NA	0.005	NA	14.80	0.001	0.01	1.00	0.05	0.27	2.29	69.16	X		
Lead	---	Amb Typical	0.01	NA	0.01	NA	43.20	0.001	0.05	1.00	0.03	1.54	0.04	222.22		X	
Mercury	---	Amb Typical	0.01	NA	0.01	NA	0.32	0.001	0.0004	1.00	0.03	0.01	1.24	5.71	X		

Notes:

Ambient Hi The high dose calculation using the Tidal Area 99th percent ambient value
Ambient Lo The low dose calculation using the Tidal Area 99th percent ambient value
Amb Typical The typical dose calculation using the Tidal Area 99th percent ambient value
BW Body weight
[clam] Concentration of chemical in clam
DDT Dichlorodiphenyltrichloroethane
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of sediment
kg/day Kilograms per day
mg/kg Milligrams per kilogram
mg/kg/day Milligrams per kilogram per day
NA Not available
PCB Polychlorinated biphenyl
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
UCL Upper confidence limit

a Chemicals were selected based on available TRV information
b Point doses were calculated for each sample location
c The HQ for the 95UCL was only calculated for chemicals with an HQ greater than 1
--- Not applicable to the analysis

TABLE T7-10

CALIFORNIA BLACK RAIL HAZARD QUOTIENT CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Cadmium	WHSSB002	0.33	0.09	NA	2.03	27.81	0.003	0.16	0.01	NA	NA
Copper	WHSSBA02	9.13	2.41	NA	46.66	678.60	0.004	0.20	0.01	NA	NA
Lead	WHSSB002	6.93	1.83	3.59	0.04	222.22	0.01	**185.75**	0.03	**96.18**	0.02
	95UCL[a]	4.27	1.13	2.21	0.04	222.22	0.01	**114.61**	0.02	**59.34**	0.01
Mercury	WHSSB022	1.29	0.34	0.67	1.24	5.71	0.06	**1.04**	0.23	0.54	0.12
	WHSSBB05	0.07	0.02	NA	1.24	5.71	0.003	0.06	0.01	NA	NA
Nickel	WHSSB001	8.67	2.28	NA	26.89	1017.50	0.002	0.32	0.01	NA	NA
Selenium	WHSSB001	0.44	0.11	NA	8.09	79.47	0.001	0.05	0.01	NA	NA
Zinc	WHSSB002	48.36	12.74	NA	521.50	5215.00	0.002	0.09	0.01	NA	NA
Total PCBs	OSLSL008	0.01	0.002	NA	2.29	69.16	0.00002	0.003	0.0001	NA	NA
Cadmium	Ambient[b]	0.02	0.01	NA	2.03	27.81	0.0002	0.01	0.001	NA	NA
Copper	Ambient[b]	4.68	1.23	NA	46.66	678.60	0.002	0.10	0.01	NA	NA
Lead	Ambient[b]	2.97	0.78	1.54	0.04	222.22	0.004	**79.63**	0.01	**41.23**	0.01
Mercury	Ambient[b]	0.02	0.01	0.01	1.24	5.71	0.001	0.02	0.004	0.01	0.002
Nickel	Ambient[b]	7.70	2.03	NA	26.89	1017.50	0.002	0.29	0.01	NA	NA
Selenium	Ambient[b]	0.04	0.01	NA	8.09	79.47	0.0001	0.01	0.001	NA	NA
Zinc	Ambient[b]	10.86	2.86	NA	521.50	5215.00	0.001	0.02	0.002	NA	NA
Total PCBs	Ambient[b]	0.03	0.002	NA	2.29	69.16	0.00002	0.01	0.0004	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

HQ Hazard quotient

mg/kg/day Milligrams per kilogram per day

PCB Polychlorinated biphenyl

TRV Toxicity reference value

UCL Upper confidence limit

a The HQ for the 95UCL was only calculated for chemicals with an HQ > 1

b The Tidal Area 99th percent ambient value

TABLE T7-11

RIVER OTTER DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (50% IR_{prey})	[clam] (mg/kg)	IR_{clam} (kg/day) (50% IR_{prey})	Ingestion from Aquatic Prey (mg/d)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 1.0%	Ingestion from Sediment (mg/d)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Cadmium	WHSSB002	High	0.47	0.01	0.23	0.11	0.23	0.03	4.20	0.005	0.02	0.50	4.74	0.01	0.02	0.66	X		
Copper	WHSSBA02	High	0.47	2.20	0.23	5.00	0.23	1.67	105.00	0.005	0.49	0.50	4.74	0.23	0.66	148.00	X		
Lead	WHSSB002	High	0.47	0.07	0.23	0.23	0.23	0.07	99.50	0.005	0.46	0.50	4.74	0.06	0.001	52.61		X	
	95 UCL[b]	High	0.47	0.07	0.23	0.23	0.23	0.07	60.90	0.005	0.28	0.50	4.74	0.04	0.001	52.61		X	
Mercury	WHSSB022	High	0.47	0.10	0.23	0.04	0.23	0.03	18.50	0.005	0.09	0.50	4.74	0.01	0.02	0.15	X		
Nickel	WHSSB001	High	0.47	0.08	0.23	0.55	0.23	0.15	123.00	0.005	0.57	0.50	4.74	0.08	0.06	13.19		X	
	95 UCL[b]	High	0.47	0.08	0.23	0.55	0.23	0.15	77.40	0.005	0.36	0.50	4.74	0.05	0.06	13.19	X		
Selenium	WHSSB001	High	0.47	0.52	0.23	0.51	0.23	0.24	3.50	0.005	0.02	0.50	4.74	0.03	0.02	0.28		X	
	95 UCL[b]	High	0.47	0.52	0.23	0.51	0.23	0.24	1.40	0.005	0.01	0.50	4.74	0.03	0.02	0.28		X	
Zinc	WHSSB002	High	0.47	26.40	0.23	17.70	0.23	10.25	605.00	0.005	2.81	0.50	4.74	1.38	2.27	157.33	X		
Chlordanes	OSLSL008	High	0.47	0.001	0.23	0.001	0.23	0.0005	0.001	0.005	0.00001	0.50	4.74	0.00005	0.004	1.95	X		
Heptachlor	WHSSL001	High	0.47	0.01	0.23	0.01	0.23	0.002	0.002	0.005	0.00001	0.50	4.74	0.0002	0.04	2.70	X		
Lindane	WHSSB002	High	0.47	0.0020	0.23	0.0006	0.23	0.001	0.001	0.005	0.00001	0.50	4.74	0.0001	0.02	0.87	X		
Methoxychlor	OSLSL008	High	0.47	0.0013	0.23	0.002	0.23	0.001	0.01	0.005	0.00002	0.50	4.74	0.0001	1.12	22.44	X		
Total PCBs	OSLSL008	High	0.47	0.01	0.23	0.01	0.23	0.006	0.02	0.005	0.0001	0.50	4.74	0.0006	0.08	0.29	X		
Cadmium	WHSSB002	Low	0.25	0.01	0.12	0.11	0.12	0.01	4.20	0.002	0.01	0.25	10.42	0.001	0.02	0.66	X		
Copper	WHSSBA02	Low	0.25	2.20	0.12	5.00	0.12	0.89	105.00	0.002	0.26	0.25	10.42	0.03	0.66	148.00	X		
Lead	WHSSB002	Low	0.25	0.07	0.12	0.23	0.12	0.04	99.50	0.002	0.25	0.25	10.42	0.01	0.001	52.61		X	
	95 UCL[b]	Low	0.25	0.07	0.12	0.23	0.12	0.04	60.90	0.002	0.15	0.25	10.42	0.004	0.001	52.61		X	
Mercury	WHSSB022	Low	0.25	0.10	0.12	0.04	0.12	0.02	18.50	0.002	0.05	0.25	10.42	0.002	0.02	0.15	X		
Nickel	WHSSB001	Low	0.25	0.08	0.12	0.55	0.12	0.08	123.00	0.002	0.30	0.25	10.42	0.01	0.06	13.19	X		
	95 UCL[b]	Low	0.25	0.08	0.12	0.55	0.12	0.08	77.40	0.002	0.19	0.25	10.42	0.01	0.06	13.19	X		
Selenium	WHSSB001	Low	0.25	0.52	0.12	0.51	0.12	0.13	3.50	0.002	0.01	0.25	10.42	0.003	0.02	0.28	X		
	95 UCL[b]	Low	0.25	0.52	0.12	0.51	0.12	0.13	1.40	0.002	0.003	0.25	10.42	0.003	0.02	0.28	X		
Zinc	WHSSB002	Low	0.25	26.40	0.12	17.70	0.12	5.45	605.00	0.002	1.49	0.25	10.42	0.17	2.27	157.33	X		
Chlordanes	OSLSL008	Low	0.25	0.001	0.12	0.001	0.12	0.0002	0.001	0.002	0.000004	0.25	10.42	0.00001	0.004	1.95	X		
Heptachlor	WHSSL001	Low	0.25	0.01	0.12	0.01	0.12	0.001	0.002	0.002	0.000004	0.25	10.42	0.00003	0.04	2.70	X		
Lindane	WHSSB002	Low	0.25	0.0020	0.12	0.0006	0.12	0.0003	0.001	0.002	0.000003	0.25	10.42	0.00001	0.02	0.87	X		
Methoxychlor	OSLSL008	Low	0.25	0.0013	0.12	0.002	0.12	0.0004	0.01	0.002	0.00001	0.25	10.42	0.00001	1.12	22.44	X		
Total PCBs	OSLSL008	Low	0.25	0.01	0.12	0.01	0.12	0.003	0.02	0.002	0.00004	0.25	10.42	0.0001	0.08	0.29	X		
Lead	WHSSB002	Typical	0.36	0.07	0.18	0.23	0.18	0.05	99.50	0.004	0.35	0.50	8.18	0.02	0.001	52.61		X	
	95 UCL[b]	Typical	0.36	0.07	0.18	0.23	0.18	0.05	60.90	0.004	0.22	0.50	8.18	0.02	0.001	52.61		X	
Nickel	WHSSB001	Typical	0.36	0.08	0.18	0.55	0.18	0.11	123.00	0.004	0.44	0.50	8.18	0.03	0.06	13.19	X		
	95 UCL[b]	Typical	0.36	0.08	0.18	0.55	0.18	0.11	77.40	0.004	0.28	0.50	8.18	0.02	0.06	13.19	X		
Selenium	WHSSB001	Typical	0.36	0.52	0.18	0.51	0.18	0.18	3.50	0.004	0.01	0.50	8.18	0.01	0.02	0.28	X		
	95 UCL[b]	Typical	0.36	0.52	0.18	0.51	0.18	0.18	1.40	0.004	0.005	0.50	8.18	0.01	0.02	0.28	X		
Cadmium	--	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	0.33	0.005	0.002	0.50	4.74	0.0002	0.02	0.66	X		
Copper	--	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	68.10	0.005	0.32	0.50	4.74	0.03	0.66	148.00	X		

TABLE T7-11

RIVER OTTER DOSE CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT
TIDAL AREA QEA, NWS SBD CONCORD

Chemical[a]	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (mg/kg)	IR_{fish} (kg/day) (50% IR_{prey})	[clam] (mg/kg)	IR_{clam} (kg/day) (50% IR_{prey})	Ingestion from Aquatic Prey (mg/d)	[sediment] (mg/kg)	$IR_{sediment}$ (kg/day) 1.0%	Ingestion from Sediment (mg/d)	SUF	BW (kg)	Dose (mg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
Lead	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	43.20	0.005	0.20	0.50	4.74	0.02	0.001	52.61		X	
Mercury	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	0.43	0.005	0.002	0.50	4.74	0.0002	0.02	0.15	X		
Nickel	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	112.00	0.005	0.52	0.50	4.74	0.05	0.06	13.19	X		
Selenium	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	0.64	0.005	0.003	0.50	4.74	0.0003	0.02	0.28	X		
Zinc	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	158.00	0.005	0.73	0.50	4.74	0.08	2.27	157.33	X		
Total PCBs	---	Ambient Hi	0.47	NA	0.23	NA	0.23	NA	0.02	0.005	0.0001	0.50	4.74	0.00001	0.08	0.29	X		
Cadmium	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	0.33	0.002	0.001	0.25	10.42	0.00002	0.02	0.66	X		
Copper	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	68.10	0.002	0.17	0.25	10.42	0.004	0.56	148.00	X		
Lead	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	43.20	0.002	0.11	0.25	10.42	0.003	0.001	52.61		X	
Mercury	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	0.43	0.002	0.001	0.25	10.42	0.00003	0.02	0.15	X		
Nickel	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	112.00	0.002	0.28	0.25	10.42	0.01	0.06	13.19	X		
Selenium	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	0.64	0.002	0.002	0.25	10.42	0.00004	0.02	0.28	X		
Zinc	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	158.00	0.002	0.39	0.25	10.42	0.01	2.27	157.33	X		
Total PCBs	---	Ambient Lo	0.25	NA	0.12	NA	0.12	NA	0.02	0.002	0.00004	0.25	10.42	0.000001	0.08	0.29	X		
Lead	---	Amb Typical	0.36	NA	0.18	NA	0.18	NA	43.20	0.004	0.15	0.50	8.18	0.01	0.001	52.61		X	
Nickel	---	Amb Typical	0.36	NA	0.18	NA	0.18	NA	112.00	0.004	0.40	0.50	8.18	0.02	0.06	13.19	X		
Selenium	---	Amb Typical	0.36	NA	0.18	NA	0.18	NA	0.64	0.004	0.002	0.50	8.18	0.0001	0.02	0.28	X		

Notes:

Ambient Hi **The high dose calculation using the Tidal Area 99th percent ambient value**
Ambient Lo **The low dose calculation using the Tidal Area 99th percent ambient value**
Amb Typical **The typical dose calculation using the Tidal Area 99th percent ambient value**
BW **Body weight**
[clam] **Concentration of chemical in clam**
[fish] **Concentration of chemical in fish**
IR_{prey} **Ingestion rate of prey**
$IR_{sediment}$ **Ingestion rate of soil**
kg/day **Kilograms per day**
mg/kg **Milligrams per kilogram**
mg/kg/day **Milligrams per kilogram per day**
NA **Not available**
PCB **Polychlorinated biphenyl**
[sediment] **Concentration of chemical in sediment**
SUF **Site use factor**
TRV **Toxicity reference value**
UCL **Upper confidence limit**

a **Chemicals were selected based on available TRV information**
b **The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1**
--- **Not applicable to the analysis**

TABLE T7-12

RIVER OTTER HAZARD QUOTIENT CALCULATIONS IN THE SOUTH OTTER SLUICE AQUATIC UNIT TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (mg/kg/day)	Low Dose (mg/kg/day)	Typical Dose (mg/kg/day)	Low TRV (mg/kg/day)	High TRV (mg/kg/day)	HQ_1 (Low Dose/ High TRV)	HQ_2 (High Dose/ Low TRV)	HQ_3 (High Dose/ High TRV)	HQ_4 (Typical Dose/ Low TRV)	HQ_5 (Typical Dose/ High TRV)
Cadmium	WHSSB002	0.01	0.00	NA	0.02	0.66	0.001	0.33	0.01	NA	NA
Copper	WHSSBA02	0.23	0.03	NA	0.66	148.00	0.0002	0.35	0.002	NA	NA
Lead	WHSSB002	0.06	0.01	0.02	0.001	52.61	0.0001	**93.60**	0.001	**41.51**	0.0005
	95 UCL[a]	0.04	0.004	0.02	0.001	52.61	0.0001	**62.05**	0.001	**27.51**	0.0003
Mercury	WHSSB022	0.01	0.002	NA	0.02	0.15	0.01	0.83	0.08	NA	NA
Nickel	WHSSB001	0.08	0.01	0.03	0.06	13.19	0.001	**1.36**	0.01	0.60	0.003
	95 UCL[a]	0.05	0.01	0.02	0.06	13.19	0.0005	0.96	0.004	0.43	0.002
Selenium	WHSSB001	0.03	0.003	0.01	0.02	0.28	0.01	**1.39**	0.10	0.62	0.04
	95 UCL[a]	0.03	0.003	0.01	0.02	0.28	0.01	**1.34**	0.09	0.59	0.04
Zinc	WHSSB002	1.38	0.17	NA	2.27	157.33	0.001	0.61	0.01	NA	NA
Chlordanes	OSLSL008	0.00005	0.00001	NA	0.004	1.95	0.000003	0.01	0.00003	NA	NA
Heptachlor	WHSSL001	0.0002	0.00003	NA	0.04	2.70	0.00001	0.01	0.0001	NA	NA
Lindane	WHSSB002	0.0001	0.00001	NA	0.02	0.87	0.00001	0.003	0.0001	NA	NA
Methoxychlor	OSLSL008	0.0001	0.00001	NA	1.12	22.44	0.0000005	0.0001	0.000004	NA	NA
Total PCBs	OSLSL008	0.001	0.00008	NA	0.08	0.29	0.0003	0.01	0.002	NA	NA
Cadmium	Ambient[b]	0.0002	0.00002	NA	0.02	0.66	0.00003	0.01	0.0002	NA	NA
Copper	Ambient[b]	0.03	0.004	NA	0.66	148.00	0.00003	0.05	0.0002	NA	NA
Lead	Ambient[b]	0.02	0.003	0.01	0.001	52.61	0.00005	**35.32**	0.0004	**15.66**	0.0002
Mercury	Ambient[b]	0.0002	0.00003	NA	0.02	0.15	0.0002	0.01	0.001	NA	NA
Nickel	Ambient[b]	0.05	0.01	0.02	0.06	13.19	0.0005	0.99	0.004	NA	NA
Selenium	Ambient[b]	0.0003	0.00	0.0001	0.02	0.28	0.0001	0.02	0.001	NA	NA
Zinc	Ambient[b]	0.08	0.01	NA	2.27	157.33	0.0001	0.03	0.0005	NA	NA
Total PCBs	Ambient[b]	0.00001	0.000001	NA	0.08	0.29	0.000003	0.0001	0.00003	NA	NA

Notes: **Bold font indicates an HQ greater than 1**

DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg/day Milligrams per kilogram per day
UCL Upper confidence limit

a The dose for the 95UCL was only calculated for chemicals with an HQ greater than 1

b The Tidal Area 99th percent ambient value

TABLE T7-13

GREAT BLUE HERON DIOXIN DOSE CALCULATIONS IN THE OTTER SLUICE TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish]	IR_{fish} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (ug/kg)	[sediment]	$IR_{sediment}$ (kg/day) 3.3%	Ingestion from Sediment (µg/kg)	SUF	BW (kg)	Dose[a] (µg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
PCDD/Fs	OSLSL005	High	0.11	0.0004	0.11	0.00004	0.77	0.003	0.003	1.00	2.09	0.001	0.001	0.06		X	
PCDD/Fs	OSLSL006	High	0.11	0.0004	0.11	0.00004	1.40	0.003	0.005	1.00	2.09	0.002	0.001	0.06		X	
PCDD/Fs	OSLSL007	High	0.11	0.001	0.11	0.0001	0.96	0.003	0.003	1.00	2.09	0.002	0.001	0.06		X	
PCDD/Fs	OSLSL008	High	0.11	0.001	0.11	0.0001	2.57	0.003	0.01	1.00	2.09	0.004	0.001	0.06		X	
PCDD/Fs	OSLSL005	Low	0.09	0.0004	0.09	0.00004	0.77	0.003	0.002	0.75	2.48	0.001	0.001	0.06		X	
PCDD/Fs	OSLSL006	Low	0.09	0.0004	0.09	0.00004	1.40	0.003	0.004	0.75	2.48	0.001	0.001	0.06		X	
PCDD/Fs	OSLSL007	Low	0.09	0.001	0.09	0.0001	0.96	0.003	0.003	0.75	2.48	0.001	0.001	0.06		X	
PCDD/Fs	OSLSL008	Low	0.09	0.001	0.09	0.0001	2.57	0.003	0.01	0.75	2.48	0.002	0.001	0.06		X	
PCDD/Fs	OSLSL005	Typical	0.10	0.0004	0.10	0.00004	0.77	0.003	0.002	1.00	2.39	0.001	0.001	0.06		X	
PCDD/Fs	OSLSL006	Typical	0.10	0.0004	0.10	0.00004	1.40	0.003	0.004	1.00	2.39	0.002	0.001	0.06		X	
PCDD/Fs	OSLSL007	Typical	0.10	0.001	0.10	0.0001	0.96	0.003	0.003	1.00	2.39	0.001	0.001	0.06		X	
PCDD/Fs	OSLSL008	Typical	0.10	0.001	0.10	0.0001	2.57	0.003	0.01	1.00	2.39	0.003	0.001	0.06		X	

Notes:

BW Body weight
[fish] Concentration of chemical in fish
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of sediment
kg/day Kilograms per day
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
µg/kg/day Micrograms per kilogram per day
µg/kg Micrograms per kilogram

a Point doses were calculated for each sample location

TABLE T7-14
GREAT BLUE HERON DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE OTTER SLUICE TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (µg/kg/day)	Low Dose (µg/kg/day)	Typical Dose	Low TRV (µg/kg/day)	High TRV (µg/kg/day)	HQ_1 (Low dose/ High TRV)	HQ_2 (High dose/ Low TRV)	HQ_3 (High dose/ High TRV)	HQ_4 (Typical dose/ Low TRV)	HQ_5 (Typical dose/ High TRV)
PCDD/Fs	OSLSL005	0.001	0.001	0.001	0.001	0.06	0.01	**1.91**	0.02	**1.59**	0.02
PCDD/Fs	OSLSL006	0.002	0.001	0.002	0.001	0.06	0.02	**3.45**	0.03	**2.86**	0.03
PCDD/Fs	OSLSL007	0.002	0.001	0.001	0.001	0.06	0.01	**2.43**	0.02	**2.02**	0.02
PCDD/Fs	OSLSL008	0.004	0.002	0.003	0.001	0.06	0.04	**6.35**	0.06	**5.26**	0.05

Notes: **Bold font indicates a HQ greater than 1**

HQ Hazard quotient
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
SUF Site use factor
TRV Toxicity reference value
µg/kg/day Micrograms per kilogram per day

TABLE T7-15

CALIFORNIA BLACK RAIL DIOXIN DOSE CALCULATIONS IN THE OTTER SLUICE TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	Dose Type	IR_{prey} (kg/day)	[clam] (µg/kg)	IR_{clam} (kg/day) (100% IR_{prey})	Ingestion from Aquatic Prey (µg/kg)	[sediment] (µg/kg)	$IR_{sediment}$ (kg/day) 18%	Ingestion from Sediment (µg/kg)	SUF	BW (kg)	Dose[a] (µg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
PCDD/Fs	OSLSL005	High	0.01	0.0004	0.01	0.000003	0.77	0.001	0.001	1.00	0.02	0.05	0.05	4.89		X	
PCDD/Fs	OSLSL006	High	0.01	0.0004	0.01	0.000003	1.40	0.001	0.002	1.00	0.02	0.10	0.05	4.89		X	
PCDD/Fs	OSLSL007	High	0.01	0.001	0.01	0.000004	0.96	0.001	0.001	1.00	0.02	0.07	0.05	4.89		X	
PCDD/Fs	OSLSL008	High	0.01	0.001	0.01	0.000004	2.57	0.001	0.004	1.00	0.02	0.18	0.05	4.89		X	
PCDD/Fs	OSLSL005	Low	0.005	0.0004	0.005	0.000002	0.77	0.001	0.001	1.00	0.05	0.01	0.05	4.89	X		
PCDD/Fs	OSLSL006	Low	0.005	0.0004	0.005	0.000002	1.40	0.001	0.001	1.00	0.05	0.03	0.05	4.89	X		
PCDD/Fs	OSLSL007	Low	0.005	0.001	0.005	0.000002	0.96	0.001	0.001	1.00	0.05	0.02	0.05	4.89	X		
PCDD/Fs	OSLSL008	Low	0.005	0.001	0.005	0.000002	2.57	0.001	0.002	1.00	0.05	0.05	0.05	4.89	X		
PCDD/Fs	OSLSL005	Typical	0.01	0.0004	0.01	0.000003	0.77	0.001	0.001	1.00	0.03	0.03	0.05	4.89	X		
PCDD/Fs	OSLSL006	Typical	0.01	0.0004	0.01	0.000003	1.40	0.001	0.002	1.00	0.03	0.05	0.05	4.89		X	
PCDD/Fs	OSLSL007	Typical	0.01	0.001	0.01	0.000003	0.96	0.001	0.001	1.00	0.03	0.03	0.05	4.89	X		
PCDD/Fs	OSLSL008	Typical	0.01	0.001	0.01	0.000003	2.57	0.001	0.003	1.00	0.03	0.09	0.05	4.89		X	

Notes:

BW Body weight
[clam] Concentration of chemical in clams
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of sediment
kg/day Kilograms per day
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
µg/kg/day Micrograms per kilogram per day
µg/kg Micrograms per kilogram
a Point doses were calculated for each sample location

TABLE T7-16

CALIFORNIA BLACK RAIL DIOXIN HAZARD QUOTIENT DOSE CALCULATIONS IN THE OTTER SLUICE TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (µg/kg/day)	Low Dose (µg/kg/day)	Typical Dose	Low TRV (µg/kg/day)	High TRV (µg/kg/day)	HQ_1 (Low dose/ High TRV)	HQ_2 (High dose/ Low TRV)	HQ_3 (High dose/ High TRV)	HQ_4 (Typical dose/ Low TRV)	HQ_5 (Typical dose/ High TRV)
PCDD/Fs	OSLSL005	0.05	0.01	0.03	0.05	4.89	0.00	**1.09**	0.01	0.56	0.01
PCDD/Fs	OSLSL006	0.10	0.03	0.05	0.05	4.89	0.01	**1.97**	0.02	**1.02**	0.01
PCDD/Fs	OSLSL007	0.07	0.02	0.03	0.05	4.89	0.00	**1.36**	0.01	0.70	0.01
PCDD/Fs	OSLSL008	0.18	0.05	0.09	0.05	4.89	0.01	**3.61**	0.04	**1.86**	0.02

Notes: **Bold font indicates a HQ greater than 1**

HQ Hazard quotient
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
SUF Site use factor
TRV Toxicity reference value
µg/kg/day Micrograms per kilogram per day

TABLE T7-17

RIVER OTTER DIOXIN DOSE CALCULATIONS IN THE OTTER SLUICE
TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	Dose Type	IR_{prey} (kg/day)	[fish] (µg/kg)	IR_{fish} (kg/day) (50% IR_{prey})	[clam] (µg/kg)	IR_{clam} (kg/day) (50% IR_{prey})	Ingestion from Aquatic Prey (ug/kg)	[sediment] (µg/kg)	$IR_{sediment}$ (kg/day) 1.0%	Ingestion from Sediment (µg/kg)	SUF	BW (kg)	Dose[a] (µg/kg/day)	Low TRV	High TRV	Below Low TRV	Between Low and High TRVs	Above High TRV
PCDD/Fs	OSLSL005	High	0.47	0.0004	0.23	0.0004	0.23	0.0002	0.65	0.005	0.003	0.50	4.74	0.0003	0.0005	0.005	X		
PCDD/Fs	OSLSL006	High	0.47	0.0004	0.23	0.0004	0.23	0.0002	1.21	0.005	0.01	0.50	4.74	0.001	0.0005	0.005	X	X	
PCDD/Fs	OSLSL007	High	0.47	0.001	0.23	0.001	0.23	0.0003	0.79	0.005	0.004	0.50	4.74	0.0004	0.0005	0.005	X		
PCDD/Fs	OSLSL008	High	0.47	0.001	0.23	0.001	0.23	0.0003	2.23	0.005	0.01	0.50	4.74	0.001	0.0005	0.005	X	X	
PCDD/Fs	OSLSL005	Low	0.25	0.0004	0.12	0.0004	0.12	0.0001	0.65	0.002	0.002	0.25	10.42	0.0000	0.0005	0.005	X		
PCDD/Fs	OSLSL006	Low	0.25	0.0004	0.12	0.0004	0.12	0.0001	1.21	0.002	0.003	0.25	10.42	0.0001	0.0005	0.005	X		
PCDD/Fs	OSLSL007	Low	0.25	0.001	0.12	0.001	0.12	0.0002	0.79	0.002	0.002	0.25	10.42	0.0001	0.0005	0.005	X		
PCDD/Fs	OSLSL008	Low	0.25	0.001	0.12	0.001	0.12	0.0002	2.23	0.002	0.01	0.25	10.42	0.0001	0.0005	0.005	X		
PCDD/Fs	OSLSL005	Typical	0.36	0.0004	0.18	0.0004	0.18	0.0001	0.65	0.004	0.002	0.50	8.18	0.0002	0.0005	0.005	X		
PCDD/Fs	OSLSL006	Typical	0.36	0.0004	0.18	0.0004	0.18	0.0001	1.21	0.004	0.004	0.50	8.18	0.0003	0.0005	0.005	X		
PCDD/Fs	OSLSL007	Typical	0.36	0.001	0.18	0.001	0.18	0.0003	0.79	0.004	0.003	0.50	8.18	0.0002	0.0005	0.005	X		
PCDD/Fs	OSLSL008	Typical	0.36	0.001	0.18	0.001	0.18	0.0003	2.23	0.004	0.01	0.50	8.18	0.001	0.0005	0.005	X	X	

Notes:

BW Body weight
[clam] Concentration of chemical in clam
[fish] Concentration of chemical in fish
IR_{prey} Ingestion rate of prey
$IR_{sediment}$ Ingestion rate of sediment
kg/day Kilograms per day
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
[sediment] Concentration of chemical in sediment
SUF Site use factor
TRV Toxicity reference value
µg/kg/day Micrograms per kilogram per day
µg/kg Micrograms per kilogram

a Point doses were calculated for each sample location

TABLE T7-18

RIVER OTTER DIOXIN HAZARD QUOTIENT CALCULATIONS IN THE OTTER SLUICE TIDAL AREA QEA, NWS SBD CONCORD

Chemical	Sample Location	High Dose (µg/kg/day)	Low Dose (µg/kg/day)	Typical Dose	Low TRV (µg/kg/day)	High TRV (µg/kg/day)	HQ_1 (Low dose/ High TRV)	HQ_2 (High dose/ Low TRV)	HQ_3 (High dose/ High TRV)	HQ_4 (Typical dose/ Low TRV)	HQ_5 (Typical dose/ High TRV)
PCDD/Fs	OSLSL005	0.0003	0.00004	0.0002	0.0005	0.005	0.01	0.71	0.07	0.31	0.03
PCDD/Fs	OSLSL006	0.001	0.0001	0.0003	0.0005	0.005	0.02	**1.28**	0.13	0.57	0.06
PCDD/Fs	OSLSL007	0.0004	0.0001	0.0002	0.0005	0.005	0.01	0.88	0.09	0.39	0.04
PCDD/Fs	OSLSL008	0.001	0.0001	0.001	0.0005	0.005	0.03	**2.36**	0.24	**1.05**	0.10

Notes: **Bold font indicates a HQ greater than 1**

HQ Hazard quotient
PCDD Polychlorinated dibenzodioxin
PCDF Polychlorinated dibenzofuran
SUF Site use factor
TRV Toxicity reference value
µg/kg/day Micrograms per kilogram per day

APPENDIX U

NAVY RESPONSES TO AGENCY COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR TIDAL AREA SITES 1, 2, 9, AND 11

RESPONSE TO CALIFORNIA DEPARTMENT OF FISH AND GAME COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR TIDAL AREA SITES 1, 2, 9, AND 11 NAVAL WEAPONS STATION, CONCORD, CALIFORNIA DATED APRIL 16, 1997

This document presents the U.S. Department of the Navy's (Navy) responses to comments received on July 25, 1997 from the California Department of Fish and Game (CDFG) on the draft remedial investigation (RI) report dated April 16, 1997 for Tidal Area Sites 1, 2, 9, and 11, Naval Weapons Station (NWS) Concord, California.

GENERAL COMMENTS

1. **Comment:** **Site 1 - Tidal Areas Landfill: We are concerned with the assumption that further investigation is not needed at the Tidal Area landfill. The principal goal of a remedial action should be to prevent or minimize the release of hazardous or deleterious substances so that they do not migrate to cause substantial danger to the environment. The "presumptive remedy" was not agreed to by DFG, and we do not feel that it will solve the problem of contamination in the wetland area around the site. Without sampling in the landfill itself there is no way to know if contaminants which may migrate to the wetland exist in the upland area. Additional sampling investigating the possibility for contaminant transport through tidally influenced groundwater is recommended. It is also necessary to examine contamination in the sediment in Otter Sluice.**

   Response: The nature and history of the fill in the Tidal Area Landfill was characterized during the site investigation (SI) phase. The contents of the landfill were sampled during prior SI activities, and the proposal to pursue a presumptive remedy (to cap the landfill) has been planned since 1995. No significant contamination was found in the landfill site.

   The Navy, with concurrence from the regulatory agencies, stated in the Tidal Area work plan (PRC Environmental Management, Inc. [PRC] 1995) that the purpose of the RI for the landfill site was to further characterize site hydrogeology and contaminant migration into surrounding waters. This reasoning was based on a presumptive remedy approach to cap the landfill, as is stated in the work plan. Sampling for the RI, consisting of surface and subsurface soil sampling, was conducted around the perimeter of the landfill to assess whether chemicals may be migrating from the landfill.

   The Navy has collected groundwater samples from the 23 existing monitoring wells and from two new monitoring wells to be constructed east of the Tidal Area Landfill. Currently, the Navy is reviewing the data, and a technical memorandum will be submitted summarizing the groundwater investigation at

the end of February 1998. The technical memorandum will be included as an addendum to the draft final RI report.

The Navy's proposed validation efforts were presented to the California Regional Water Quality Control Board (RWQCB) at a meeting on December 18, 1997. Follow-on field work includes collection of tissues for validation of the food-chain model, additional soil and sediment sampling, and aquatic bioassays. Details of the Navy's proposed field work are provided in the attached field sampling addendum (FSA).

2. **Comment:** **Site 2 - R Area Disposal Site: We do not agree with the recommendation of "no further action". This is a known disposal area with contamination which could impact trust resources which should be protected and restored to the extent practicable.**

Response: The Navy believes that site soil and surface water were adequately characterized for the RI. Assessment of the results at this time does not indicate site contamination that poses a risk that would necessitate remediation of the site. The recommendation for no further action will be revisited after the results from the groundwater sampling and additional sampling for the ecological risk assessment (ERA) have been evaluated.

For the ERA, the Navy plans to further evaluate risk to vertebrate receptors through food-chain transfer of chemicals. Pickleweed tissues will be analyzed for metals; these concentrations will be incorporated into the dose estimate for the salt marsh harvest mouse. In addition, small mammal tissues will be analyzed for metals and pesticides to provide a better estimate of the dose of these chemicals to avian receptors at the site. Details of the proposed tissue analyses are presented in Section 2.3 of the FSA attached to these comments.

The Navy also proposes presence/absence surveys for salt marsh harvest mice and black rails in the R Area. Targeted surveys for rare plants, focused on *Grindelia*, are also planned. Please see Section 4.0 and Figure 2 of the FSA for additional details on the biological surveys.

These additional tasks are intended to fill the remaining data gaps at the R Area and provide adequate information to support risk management decisions.

3. **Comment:** **Site 9 - Froid and Taylor Road Sites: We do not agree with the recommendation of "no further action". It is a small site where is may be possible to remove all contaminants with a modest removal action.**

Response: The Navy believes that site soil was adequately characterized for the RI. Assessment of the results at this time does not indicate site contamination that poses a risk that would necessitate remediation of the site. The recommendation for no further action will be revisited after the results from the groundwater sampling and additional sampling for the ERA have been evaluated.

For the ERA, the Navy proposes to further evaluate risk to receptors exposed to site sediments and surface water, particularly wading birds. Four sediment samples and collocated surface water samples will be collected from within the areas of permanent water at this site. Please see Section 1.0 and Figure 1 of the FSA for more detail.

SPECIFIC COMMENTS - VOLUME I

1. Comment: **Page ES-6, Preliminary Recommendations: We disagree with the conclusion by the Navy that no sites pose a significant immediate risk to ecological receptors. At best this document is inconclusive.**

Response: The Navy believes that the original conclusions were justified on the basis of the screening level risk assessment. Additional data collection designed to augment and validate the original risk assessment are described in the attached FSA. Topics in the FSA include (1) additional sediment, soil, and surface water chemistry to characterize Otter Sluice, Froid and Taylor Road, and the Wood Hogger sites; (2) larval fish bioassays to test the toxicity of sediments in Otter Sluice; (3) analysis of tissue residues of several taxa in Otter Sluice, the Wood Hogger, and the R Area; and (4) biological surveys focused on special status species.

2. Comment: **TableES-1, Preliminary Recommendations:**

Site 1, Tidal Landfill: should be expanded to include further sampling, and the possibility of other remedies.

Site 2, R Disposal Area: "No further action" is not an acceptable recommendation for the R Area disposal site. Concentrations of some metals and pesticides are above acceptable limits, and Hazard Indices over 1.0 were calculated for areas throughout the site.

Site 9, Froid and Taylor Roads: "No further action" is not an acceptable recommendation for this site. A removal action is advised.

Site 11, Wood Hogger: Is this recommendation the same as doing a Feasibility Study?

Response: The contents of the landfill were sampled during prior SI activities, and the proposal to pursue a presumptive remedy (to cap the landfill) has been planned since 1995. No significant contamination was found in the landfill site.

The Tidal Area Landfill feasibility study (FS) will assess both capping and no further action using the presumptive remedy approach. If additional site characterization is unnecessary under the presumptive remedy. The rationale for the selection of the presumptive remedy is discussed in more detail in the FS report.

The Navy believes that soil and surface water were adequately characterized for Sites 1, 2, 9, and 11 in the draft RI report. Assessment of the results at this time does not indicate a risk that would necessitate remediation of the site. The recommendation for no further action will be revisited after the results from the groundwater sampling and additional sampling for the ERA have been evaluated.

3. **Comment:** **Page 1-2, Section 1.0, Introduction: Did the results of Phase 1A indicate the potential for groundwater contamination? It is not clear that adequate groundwater samples were taken.**

Response: Please see response to general comment 1.

4. **Comment:** **Page 2-16, Section 2.7.1.2, Confirmation Sampling: Were any contaminants found during the confirmation sampling in 1993?**

Response: The confirmation sampling was conducted to check for the presence of volatile organic compounds (VOC) and semivolatile organic compounds (SVOC). As stated in the referenced section, no VOCs or SVOCs were detected in the 1993 confirmation sampling.

5. **Comment:** **Page 3-1, Section 3.1, Reconnaissance Activities: Who at the Department of Fish and Game was involved in coordination of the field activities, and when were they performed?**

Section 3.2, Soil Investigation: Please summarize the depths of the subsurface soil samples in the text

Response: Dr. Michael Martin was the CDFG representative during planning and execution of the RI field work in the Tidal Area. Reconnaissance activities at the Tidal Area sites were conducted in January 1995.

The text will be revised to summarize the depths of the subsurface soil samples.

6. **Comment:** **Table 3.1: A depth of 2.5 bgs is not adequate to assess impacts to ecological receptors. Some samples at greater depths should be analyzed.**

Response: Samples up to 3 feet below ground surface (bgs) will be evaluated against ambient concentrations and wetland cover values. The Navy considers exposure of most ecological receptors, with the exception of plant roots, to soils below 3 feet bgs highly unlikely at the Tidal Area sites. Exposure to the pickleweed, one of the most prevalent plants in the area, will be evaluated through direct measurement of chemical residues in tissues. See Section 2.3 of the attached FSA for details of the plant tissue analysis.

7. **Comment:** **Page 4-1, Section 4.0, Laws and Regulations: The attached table includes Department of Fish and Game ARARs and TBCs. These sections should be added to the text and to Table 4-1.**

Response: The Navy reviewed the table provided by CDFG to determine which of the cited provisions are chemical- or location-specific applicable or relevant and appropriate requirements (ARAR). As CDFG states, Fish and Game Code Section 1600 provisions do not impose a substantive requirement and are therefore not ARARs. CDFG requested that the provisions be adopted as to be considered (TBC). However, promulgated requirements that not ARARs are also not TBCs by definition. The streambed alteration provisions of Sections 1601 and 1602 of the Fish and Game Code may be action-specific ARARs. However, the RI is evaluating only chemical- and location-specific ARARs except for capping the Tidal Area Landfill. Therefore, streambed alteration provisions will be evaluated in the FS if actions that result in streambed alteration are proposed. The damage provisions of Section 2014 of the Fish and Game Code do not provide chemical-, location-, or action-specific substantive provisions and are not ARARs. The Navy has included the endangered species and rare native plant provisions of the Fish and Game Code as location-specific ARARs. Section 3005 of the Fish and Game Code, relating to taking of birds and mammals, has not yet been included as a location-specific ARAR. The Navy will evaluate this provision as a potential action-specific ARAR during the FS.

8. **Comment:** **Page 6-1, Section 6.0, Chemical Characterization of the Tidal Area Sites: As mentioned above, the Department does not believe that capping the landfill is the proper solution for containing contaminants in a wetland. The contents of the landfill should be characterized.**

Response: Please refer to response to general comment 1.

9. **Comment:** **Page 6-7, Section 6.1.2.2, Lead: If elevated lead at the landfill may be a direct result of disposal activities, removal is appropriate.**

Section 6.1.3, Organic Compounds in Soil: Please summarize results of pesticide detections in the text for the Landfill as it is done for the R Area Disposal Site.

Response: If the elevated lead concentrations detected in surface soil samples collected adjacent to the landfill are a direct result of disposal activities, capping the landfill will halt the migration of lead due to erosion of the landfill material.

Pesticides detected in soil samples collected from the Tidal Area Landfill are summarized in the last paragraph of Section 6.1.2.1, page 6-5.

10. Comment: **Page 6-13, Section 6.2.3.1, Pesticides/PCBs: This section states that pesticides were not found in subsurface samples. Most sampling locations which show elevated DDT levels did not have subsurface samples taken.**

Response: The text will be clarified to indicate that although pesticides were not detected in subsurface soil samples from the R Area Disposal site, subsurface soil samples were not collected at the two locations with the highest concentrations of total dichlorodiphenyltrichloroethane (DDT) in surface soil.

11. Comment: **Page 6-21, Section 6.2.6.1, Inorganic Compounds in Soil: Elevated arsenic concentrations occur in a known disposal area. They may well be from anthropogenic sources.**

Response: The draft final RI report will indicate the potential for arsenic to occur in site soil from both anthropogenic and nonanthropogenic sources.

12. Comment: **Page 8-1, Section 8.0, Contaminant Fate and Transport: I could not locate the COCs in Section 7.6 of the HHRA.**

Response: The text will be revised to indicate that the contaminants of concern (COC) are summarized in Section 7.5 and are listed in Table 7-11.

13. Comment: **Page 9-4, Section 9.2.4, Preliminary Recommendations and Conclusions: The FS which follows for the Tidal Area Landfill should include alternatives other than capping and no further action.**

Response: Presumptive remedies apply to specific remediation scenarios for which analysis and experience consistently indicate one particular remedy as superior. The presumptive remedy approach is promulgated by the U.S. Environmental Protection Agency (EPA) for the express purpose of streamlining the FS process in situations such as these. In the case of landfills that require remedial action, capping is almost always the optimal alternative and hence was selected as the presumed remedy in the Tidal Area work plan (PRC 1995). The alternatives of capping and no further action may both contain monitoring components.

14. Comment: **Page 9-8, Section 9.3.4, Preliminary Recommendations and Conclusions: The levels of contamination in the R Area Disposal Site which may cause impacts to fish and wildlife resources do not support the "no further action" conclusion.**

Response: Please see response to general comment 2.

15. **Comment:** **Page 9-15, Section 9.5.4, Preliminary Recommendations and Conclusions: "No further action" is not appropriate for an area with HI greater than 1. Further investigation is needed.**

Response: Please see the attached FSA for the Navy's proposed plan to complete the data collection necessary to reach risk management decisions at the four Tidal Area sites.

SPECIFIC COMMENTS - VOLUME II

1. **Comment:** **Page 3-4, Section 3.1.5, Field Assessment (Wetlands Delineation and Wetlands Functional Assessment): The Department does not recognize the Army Corps of Engineers wetlands delineation. The appropriate delineation technique is that developed by the U.S. Fish and Wildlife Service (U.S.F.W.S.). Considering that the Navy is using the U.S.F.W.S. wetland classification system (p. 3-6) it is appropriate to use their system of delineation.**

Response: Wetlands at the Tidal Area sites were classified by both the U.S. Fish and Wildlife Service (FWS) "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin and Others 1979) and the U.S. Army Corps of Engineers (COE) wetland delineation procedures (40 Code of Federal Regulations [CFR] Part 230). All areas classified as wetland habitats under the FWS classification system were also delineated as potential jurisdictional wetlands using COE methods. The draft final RI report will reflect the use of both methods of wetland delineation. However, if a remedial action is planned, the COE protocols will be followed, as required by 40 CFR Part 230, Section 404(b)(1).

2. **Comment:** **Page 3-7, Section 3.2.1, Upland Habitats: Upland habitats should have none of the wetland identification criteria (soils, hydrology, or hydric soils).**

Response: According to (Cowardin and Others 1979), a wetland is any area that meets one of three criteria based on features of the (1) soils, (2) hydrology, and (3) hydric vegetation. Areas classified as upland, as described in Section 3.2.1, met none of the criteria.

3. **Comment:** **Page 3-26, Section 3.3.1, Special Status Plants: Efforts should be made this fall to determine if Marsh gumplant (*Grindelia stricta* var. *Angustifolia*) is present in the tidal area.**

Response: Please see Section 4.0 and Figure 2 of the attached FSA for the Navy's proposed surveys for *Grindelia*.

4. **Comment:** **Page 3-27, Section 3.3.1, Special Status Plants: Because of the possibility of the presence of special status plant species in the upland areas, more thorough surveys should be performed if upland areas are to be disturbed during clean-up activities.**

Response: No special status plant species are expected to occur in the upland areas, which are best characterized as ruderal habitats dominated by exotic species. If upland areas were to be the focus of any remedial action, necessary surveys would be performed.

5. **Comment:** **Page 3-29, Section 3.3.4, Special Status Reptiles and Amphibians: The western pond turtle (Clemmys marmorata), while designated as a Species of Special Concern, is considered by experts to be threatened or endangered throughout California. Many populations show adult bias, indicating little or no recruitment of juveniles. This could be due to loss of nesting habitat or corridors to nesting habitat. It is recommended that at least 500 m from the aquatic site known to harbor western pond turtles are needed to adequately protect nesting habitat. Therefore, upland areas at Concord NWS could be significant nesting areas. Further surveys are recommended for the western pond turtle, California tiger salamander and red-legged frog.**

Response: Herpetological surveys were conducted by WESCO in 1994, and are presented in WESCO (1995). Sightings of special status species, including the western pond turtle, were presented in Section 3.3 of the draft final ERA. Western pond turtles were observed basking near slough channels in the southeast area of the Wood Hogger site, and along Otter Sluice in several locations.

Red-legged frogs have been observed east of the Tidal Area sites at NWS Concord (Harding Lawson Associates [HLA] 1996). California tiger salamanders have been observed at the installation also (Morrison and Others 1994). However, neither red-legged frogs nor California tiger salamanders were observed during habitat characterization in the Tidal Area sites by WESCO in 1994. Protection of habitat of reptiles and amphibians would be considered during the design phase of any planned remedial action.

6. **Comment:** **Page 4-1, Section 4.1.1, Soil Investigation: Please indicate the maximum depth of subsurface soil samples.**

Response: The maximum depths of soil samples at each site were 5.8 feet bgs at Site 1, 5.8 feet bgs at Site 2, 2.5 feet bgs at Site 9, and 20 feet bgs at Site 11. Please see response to general comment 6 for information on the sample depths relevant to the qualitative ecological assessment (QEA).

7. **Comment:** **Page 5-1, Section 5.0, Methods of Screening Contaminants: In order to better characterize the nature and extent of contamination, COECs should be identified for each site. This will help avoid the omission of chemicals as COECs which may occur primarily at an individual site and will help to identify hot spots for which remedial action may be needed. HI's for wide ranging receptors would include contaminants from all sites.**

Response: The Navy agrees that contaminants of ecological concern (COEC) should be screened site by site. The draft final RI report will reflect this change in approach.

8. **Comment:** **Page 6-3, Section 6.1.1.1, Aluminum: How was the estimated ambient level determined? The samples show a wide range of values, which may indicate that the higher values are from anthropogenic sources.**

Response: Based on the California Department of Toxic Substances Control (DTSC) recommendations, the Navy will revise the approach used to estimate ambient levels for the draft final RI report. DTSC no longer recommends the use of the lower confidence limit (LCL) on quantiles (80/95 LCL) to estimate ambient levels. Instead, DTSC suggests using simple estimates of quantiles (the 99th percentile) to describe the upper range of ambient conditions at the site. The approach for screening contaminants of potential concern (COPC) will also be revised to simplify the selection process. If the maximum concentration of a site metal is greater than the ambient level established for the metal, it will be retained as a COEC in the QEA.

9. **Comment:** **Page 6-5, Section 6.1.1.3, Arsenic: The majority of the samples exceeded the ER-L. Arsenic should be considered a COEC until additional analysis is completed.**

Response: Estimates of ambient concentrations of metals have been revised, as directed by DTSC (please see DTSC comment 4). Site concentrations will be rescreened against the revised ambient values. Also, as indicated in the response to EPA volume II general comment 2, COECs will be identified for each site rather than for the whole area in the draft final RI report. Wetland cover values, rather than effects range-low (ER-L), are the selected screening values.

10. **Comment:** **Page 6-15, Section 6.1.1.20, Summary of Inorganic COECs in Soil and Sediment: Aluminum and Arsenic should be considered COECs pending further investigation.**

Response: Please see response to Volume II specific comments 8 and 9 above.

11. **Comment:** **Page 6-32, Section 6.1.4, Summary of Inorganic COECs for the Tidal Area Sites: Aluminum and Arsenic should be considered COECs pending further investigation.**

Response: Please see response to Volume II specific comments 8 and 9 above.

12. **Comment:** **Page 6-48, Section 6.2.1.7, Summary of Organic COECs in Soil and Sediment: Based upon the high concentration of Gamma-Chlordane found in the Site 9 subsurface sample, it should be included as a COEC.**

Response: Chlordane was excluded from the original list of COECs based on low frequency of detection. The Navy will reevaluate hot spots in the draft final RI report by evaluating chemicals site by site and considering the spatial distribution of exceedances within a site. In addition, the Navy will collect two subsurface confirmation samples in the area adjacent to the chlordane hit at Site 9 (Froid and Taylor Roads Site).

13. **Comment:** **Page 6-52, Section 6.2.3, Summary of Organic COECs for the Tidal Area Sites: Based upon the high concentration of Gamma-Chlordane found in the Site 9 subsurface sample, it should be included as a COEC.**

Response: Please see response to Volume II specific comment 12 above.

14. **Comment:** **Page 6-54, Section 6.3, Summary of COECs Identified for the Tidal Area Sites: The text for this section is not consistent with the title. Further, Chlordane is one of the organochlorine pesticides which is not easily degraded or metabolized in the environment. As such, it should be quantitatively evaluated.**

Response: Please see response to Volume II specific comment 12 above.

15. **Comment:** **Page 7-4, Section 7.2, Conceptual Site Model (CSM) for the Tidal Area Sites: This section indicates that Figure 7-1 depicts the CSM for the site. Figure 7-1 is correctly titled a food web, not a CSM. An adequate CSM must identify sources of contamination, exposure routes and assessment and measurement endpoints.**

Dermal exposure should be considered as an exposure route.

Response: Section 7.0 will be revised to provide a more detailed discussion of the conceptual site model (CSM) for the Tidal Area sites. The Navy realizes that dermal exposure occurs; however, estimates of the doses received through this route are considered unreliable and not useable in risk assessment at this time. The Navy would greatly appreciate any information available to the reviewers that would make evaluation of the dermal route of exposure defensible.

16. **Comment:** **Page 7-6, Section 7.2.2, Critical Receptors or Indicator Species (Terrestrial Invertebrates): Please provide justification for the species selected. Both a shorebird (e.g. black-necked stilt or sanderling) and a piscivorous bird (e.g. green heron) should be included on the list of critical receptors. The endangered California clapper rail (*Rallus longirostris obsoletus*) is another potential receptor which is absent from this section. Please provide justification for not selecting aquatic receptors for this list.**

Response: The work plan did not specifically address the selection of higher trophic level receptors. However, the Navy expanded the draft RI report to include food-chain analysis of representatives of several major feeding guilds, including mammalian herbivores and carnivores as well as several avian guilds. The draft final RI report will include a wading bird, the great blue heron, to represent an avian piscivore guild. If present, the black rail will be evaluated as a representative of the feeding guild relying on benthic invertebrates.

Risk to the great blue heron, a piscivorous bird, and the black rail, which eats benthic invertebrates, will be addressed in the follow-on ecological work described in the attached FSA. A basewide wildlife survey conducted in 1993 to 1994 yielded three pairs of clapper rails, two of which were observed near Pier 3 some distance from the Tidal Area sites (Morrison and Others 1994). The third pair of clapper rails was reportedly seen near Froid Road, although the exact location is unknown at this time. Although the California clapper rail may occur at the Tidal Area, habitat at the Tidal Area sites is considered suboptimal for this species. It is the Navy's understanding that FWS requires formal clapper rail surveys to be conducted between February 1 and April 1. The proposed field effort will not occur until mid-April, due to schedule and budget constraints. However, incidental evidence of clapper rail presence may be obtained during black rail call-back surveys. In addition, the vegetation characterization performed as part of the rail survey will provide information on the likelihood of clapper rails using the site.

Taxa reported to use the habitats at the Tidal Area were considered possible assessment endpoints. Protection of the population was used as the endpoint for all species except those for which the individual is the unit of protection due to their federal or state threatened or endangered status. By definition, assessment endpoints have ecological, toxicological, and societal importance (EPA 1992). Several site-specific factors influenced the selection of endpoints, including the occurrence, ecological significance, conservation status, life and natural history characteristics, and potential toxicological susceptibility of receptors; the known and potential contaminants present and their mechanisms of toxicity; and the spatial and temporal patterns of potential exposure.

Taxa selected as assessment endpoints were chosen to represent surrogates for ecologically important groups of receptors. Species that inhabit NWS Concord all or part of the year were selected over migratory species within a feeding guild; it is reasonable to assume that if resident species are shown not to be at risk, migrants are safe from contaminants at the site as well. Native taxa

representative of important ecological guilds were chosen as endpoints for the protection of major ecological niches in Tidal Area habitats. Some taxa selected as assessment endpoints are valued by society, as evidenced by their conservation status. Toxicological concerns also guided the selection of endpoints; the presence of metals and metalloids as COCs requires that exposure to plants and lower trophic level receptors be evaluated. Some bioaccumulating contaminants, such as dioxins, are of concern because of the increased exposure of higher-level receptors. Endpoints were chosen to represent risk posed through all major exposure pathways considered important at this site.

17. **Comment:** **Page 8-1, Section 8.0, Exposure and Effects Assessment: Please provide justification developing separate HIs for organic and inorganic contaminants.**

Response: The use of hazard quotients (HQ) is widespread in ecological assessments, and is recommended in both state and federal guidance (DTSC 1996a, 1996b; EPA 1997). However, the technical literature is replete with criticisms of this approach, particularly as the basis for risk estimates (for example, see Tiebout and Brugger 1995). Summing individual HQs to arrive at a hazard index (HI) is even more problematic, as the assumptions of additivity are rarely justified. DTSC guidance leaves it to the user to decide whether grouping by target organ, mode of action, or chemical class is warranted (DTSC 1996a, page 45). The Navy, in consultation with regulatory agencies throughout the design phase of this ERA, decided to group the HQs by chemical class; this approach is consistent with both DTSC (1996a, 1996b) and EPA (1997). The technical literature (Ingersoll and Others 1997; Tiebout and Brugger 1995; Solana and Others 1986; Urban and Cook 1986) suggests that screening-level evaluations of complex chemical mixtures may benefit from a summation of HQs for chemicals that produce adverse effects by the same toxic mechanism. Although mode of action varies within the two classes of chemicals (organic and inorganic), the separation clearly captures the inherent differences in toxic mechanisms for these two chemical groups.

18. **Comment:** **Page 9-5, Section 9.3, Comparisons with Benchmark Values: Enclosed is a table prepared by the Department with recommended soil PRGs for plants, birds, mammals and invertebrates. Some of the numbers may vary slightly from those shown in Table 9-1. The more conservative of the numbers should be used.**

Response: The Navy will review the CDFG numbers provided and incorporate them into the draft final RI report as appropriate.

19. Comment: **Page 10-4, Section 10.3, Risk Characterization Summary for Invertebrates: Refer to the DFG soil PRGs for terrestrial invertebrates.**

Response: The Navy will review the CDFG numbers provided and incorporate them into the draft final RI report as appropriate.

20. Comment: **Page 11-2, Section 11.1.1, Deterministic Food-Chain Model: the food-chain model uses the body weight of the receptor in the calculation for dose. This method is not approved by DFG. The derivation of HQs compares dose to both high and low toxicity reference values (TRVs). First, the TRV document prepared by the Navy is still undergoing BTAG review. Second, the HQs which are derived from low TRVs must be used to establish risk or the likelihood of adverse effects from contaminants to trust natural resources. These HQs should protect the most sensitive species, as they use lowest no observable adverse effect levels or NOAELs. If these numbers are not employed to estimate risks and drive remediation, full protection of fish, wildlife, biota, and their receptors can not be achieved. Any resultant remedial action based upon the use of high TRVs will, more likely than not, cause continued injuries to State trust resources.**

Response: The comment on the use of body weight is unclear. Doses are typically defined on a per gram basis of the body weight of the receptor.

The comment is correct in stating that the Biological Technical Advisory Group (BTAG) has not approved the draft "Development of Toxicity Reference Values as Part of a Regional Approach for Conducting Ecological Risk Assessments at Naval Facilities in California" (PRC 1997); neither has the Navy. The document resulted from a consensus process, and as such does not reflect the perspective of any single agency. The draft was submitted to the agencies in June 1997. Thus far, no written comments have been received by the Navy from any state or federal agency.

The use of high and low toxicity reference values (TRV) was discussed in detail at working meetings of the Navy/BTAG TRV group, and is described in the draft In summary, when the low dose exceeds the high TRV ($HQ_1 > 1.0$), the risk is assumed to warrant immediate remedial action. When the high dose is less than the low TRV ($HQ_2 < 1.0$), the risk is considered negligible. All other situations, such as $HQ_2 > 1.0$, are explicitly defined as representing inconclusive levels of risk. TRVs are but one of the lines of evidence that provide support to a risk management decision. Alone, they do not provide resolution of all risk assessment questions.

21. Comment: **Page 11-8, Section 11.1.2.1, Food Web for the Tidal Area Landfill: Species which occur in Otter Sluice should be included in the food web.**

Response: The food web will be modified to include aquatic species occurring in Otter Sluice. WESCO (1995) contains extensive surveys and reports of aquatic habitats at the Tidal Area.

RESPONSE TO REGIONAL WATER QUALITY CONTROL BOARD CONTROL COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR TIDAL AREA SITES 1, 2, 9, AND 11 NAVAL WEAPONS STATION, CONCORD, CALIFORNIA DATED APRIL 16, 1997

This document presents the U.S. Department of the Navy's (Navy) responses to comments received on July 22, 1997, from the California Regional Water Quality Control Board (RWQCB) on the draft remedial investigation (RI) report dated April 16, 1997, for Tidal Area Sites 1, 2, 9, and 11, Naval Weapons Station (NWS) Concord, California.

GENERAL COMMENTS

1. Comment: **We found this document to be concise and well-written.**

   Response: Thank you.

2. Comment: **Preliminary Recommendations and Conclusions for the RI and QEA (Executive Summary) might include the following considerations:**

   a. ***Additional groundwater characterization.*** **According to the RPM meeting of June 15, 1997, the Navy plans to perform an additional round of groundwater sampling in selected wells and install approximately two additional wells to the east of the Tidal Area sites. This sampling will provide information regarding the ability to obtain representative groundwater samples, compare current groundwater chemical concentrations to the last round of sampling which was performed in 1990-1991, determine the presence of any organic constituents in groundwater in the vicinity of soils with detected organics, determine any potential preferential pathways for contaminant movement, confirm or refine groundwater flow directions, and provide baseline data for long-term monitoring required for the Tidal Area landfill. This type of additional groundwater work will help to provide the basis for any recommended actions (or no further action). The information discussed in the June 15th RPM meeting was useful in responding to some of the concerns I identified during my review of the Draft RI.**

   b. ***Verification of the screening-level assessment of risks to aquatic receptors and surface water beneficial uses, particularly at the Wood Hogger site, selected areas within the R Area Disposal site, and Otter Sluice.*** **With respect to aquatic invertebrate receptors and determining potential impact to beneficial uses (as defined in the RWQCB San Francisco Bay Basin Plan) of the Tidal Area, the comparisons of ecologically relevant benchmarks to sediment and water, as well as the Microtox and P450**

performed for the RI are generally considered screening evaluations. Exceedances of benchmarks and promulgated criteria were observed. The risks to higher trophic level receptors was estimated without obtaining tissue samples from the site. Although these were clearly identified in the QEA as uncertainties, RWQCB staff would typically request validation of the estimated risks by performing aquatic (sediment and water column) toxicity tests and tissue residue or laboratory bioaccumulation tests. However, given the conditions at the site unrelated to the contaminant releases, there is a question as to whether we can identify the appropriate toxicity tests and test species. In addition, it is unclear as to whether the standard approach to field validation is applicable to the Tidal Area given the salinity and hydrological regimes. This issue relates to the possibility of any limited-term biological monitoring as well, and should be explored further with the regulatory and trustee agencies, the Navy and their contractors.

c. ***Ecological risk management or controls for areas of ponded water at the R Area Disposal Site, Froid and Taylor Road, and Wood Hogger Sites (and including Otter Sluice).*** **The Hazard Indices (HI) for aquatic invertebrates were elevated for some constituents in wetland soils, sediments, and surface water indicating possible toxic effects. These areas also provide a habitat that attracts wildlife (including special status species), and therefore potential exposure and some level of risk for some vertebrate species. The Navy should consider methods by which exposure could be reduced or minimized in these areas, especially if risk validation is not performed. For example, limited removal actions, vegetating topographic highs to minimize erosion and runoff of contaminant-sorbed particulates, implementing other stormwater management controls, or performing limited-term biological monitoring.**

Response: The Navy has recently collected groundwater samples from the 23 existing monitoring wells and from two new monitoring wells constructed east of the Tidal Area Landfill. Currently, the Navy is in the process of reviewing the groundwater data and will submit a technical memorandum summarizing the groundwater investigation at the end of February 1998. The technical memorandum will be included as an addendum to the draft final RI report.

The Navy's proposed validation efforts were presented to the RWQCB at a meeting on December 18, 1997. Follow-on field work includes collection of tissues for validation of the food chain model, additional soil and sediment sampling, and aquatic bioassays. Details of the Navy's proposed field work are in the attached field sampling addendum (FSA). The information collected during the 1998 field season will be incorporated into the draft final RI report. The Navy expects that this additional information will be sufficient to support risk management decisions at these four sites.

As mentioned in the response to general comment 2b, the Navy plans additional field work to address some of these concerns. Discussion of removal actions or other forms of reducing risk, if appropriate, will be included in the draft final RI report.

SPECIFIC COMMENTS - VOLUME I

1. Comment: **Executive Summary, Human Health Risk Assessment, page ES-3: The Navy should note why groundwater was not evaluated in the human health risk assessment.**

   Response: The Navy will indicate that groundwater was not evaluated in the human health risk assessment (HHRA) because groundwater samples were not collected during the RI to supplement the old SI data.

   The Navy has recently collected groundwater samples from the 23 existing monitoring wells and from two new monitoring wells constructed east of the Tidal Area Landfill. Currently, the Navy is in the process of reviewing the groundwater data and will submit a technical memorandum summarizing the groundwater investigation at the end of February 1998. The technical memorandum will be included as an addendum to the draft final RI report.

2. Comment: **Section 2.4, Current Operations, page 2-3: The Navy should indicate why the piers, moorings, and rail car yards along the waterfront of the Tidal Area were not identified as PA/SI sites. Due to naval operations and stormwater runoff, many of the waterfront areas at other naval bases in the San Francisco Bay have been identified as IRP sites.**

   Response: The initial assessment study at NWS Concord was completed in 1983 and recommended that only Sites 1, 2, 9, and 11 be investigated further in Phase I of the RI. These four were the only Tidal Area sites that were of concern, so only these four were taken through the Installation Restoration Program (IRP).

3. Comment: **Section 2.5.3.2, Lithology and Hydrologic Units, page 2-10: The Navy should indicate the source of the imported artificial fill, if known.**

   Response: The source or sources of the imported fill are unknown.

4. Comment: **Section 2.5.3.3, Surface Water Hydrology, page 2-11: The Navy should provide the basis for the statement that groundwater discharges from the R Area and the Wood Hogger sites directly into Otter Sluice.**

   In addition, this paragraph also indicates that there is no monitoring of Otter Sluice, however, I believe that either Otter Sluice or storm drains that enter it are monitored as part of the station's stormwater compliance program. Please clarify.

Response: The section will be revised to indicate that, based on quarterly water level measurements, water usually flows from the area adjacent to Otter Sluice toward the middle of the R Area and Wood Hogger sites.

NWS Concord maintains an active storm water pollution prevention (SWPP) program independent from the IRP and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program. This SWPP program may very well include monitoring of Otter Sluice or its tributaries, but there is no regular monitoring of those water bodies as part of the IRP.

5. Comment: **Section 2.5.3.4, Summary of the Hydrogeologic Framework of the Tidal Area, page 2-11: This section discusses the groundwater in the fluvial or estuarine sands. However, there is no discussion of groundwater flow patterns in the fill material. The Navy should clarify the differences. The response may be more complete once additional groundwater sampling is completed.**

Response: The interpretation of the groundwater flow pattern at the Tidal Area sites will be further refined as additional groundwater information is collected. The results will be presented in the forthcoming technical memorandum.

6. Comment: **Section 2.7.1.1, Site Description and Operational History, Tidal Area Landfill, page 2-13: Please include a discussion of specific past mosquito abatement practices as Section 6.0 interprets the presence of pesticides at the Tidal Area landfill as a result of this activity (see page 6-25).**

Response: The site history will be revised to include a discussion of past mosquito abatement practices at the site.

7. Comment: **Section 2.7.4.1, Site Description and Operational History, Wood Hogger, page 2-25: This section indicates that there is a permanent pond and other standing water ponds that are directly connected to Otter Sluice by culverts. Please indicate on an appropriate figure the locations of these culverts and ponds; this information is important as it relates to contaminant levels, discharge to adjacent surface water bodies, and potential exposure to aquatic receptors.**

Response: A reference to Figure 2-7, which illustrates site features, will be added to the section. The ponded areas are shown as cross-hatched areas on this figure.

8. Comment: **Section 3.5, Groundwater Investigation, page 3-4: In about 1994, the Navy performed a groundwater sampling study to determine if representative samples could be obtained with a slow purge method. This effort and the results should be discussed in this section.**

Response: A discussion of the low-flow purging and sampling effort conducted at the Tidal Area sites will be added to the section.

9. Comment: **Section 4.1 ARARs Definitions, page 4-4, top paragraph: This paragraph states that groundwater is not considered a medium of concern for ARARs analysis. This statement is premature and should be deleted. The Navy has not yet demonstrated that groundwater is not of concern. ARARs for groundwater should be included in this analysis for the reasons stated below and in general comment #2.**

The groundwater was not sampled as part of the RI due to concerns about obtaining representative samples from several wells constructed in bay mud. The Navy and agencies agreed to postpone any decisions about the groundwater until after the soil, sediment, and surface water had been evaluated. Based on the results presented in the Draft RI, the Navy and agencies preliminarily agreed that an additional round of groundwater sampling would be performed to resolve any outstanding issues regarding groundwater movement and chemical concentrations.

Response: The Navy will evaluate applicable or relevant and appropriate requirements (ARAR) for groundwater when groundwater is identified as a medium of concern. The forthcoming technical memorandum will provide sufficient information to determine if groundwater is a medium of concern. The groundwater ARARs will be based on the beneficial use of the groundwater at NWS Concord, pursuant to the State of California Water Resources Control Board (SWRCB) Resolution No. 88-63 and the 1995 Basin Plan.

10. Comment: **Section 4.1, ARARs Definitions, page 4-4, third paragraph: This paragraph states that action-specific ARARs for R Area Disposal, Froid and Taylor Roads, and Wood Hogger sites will not be identified in the RI, but in the FS instead. Although this may be due in part to the need for discussions between the Navy and agencies on remedial alternatives, RWQCB staff believe that a preliminary list should be included in the RI.**

Response: In accordance with Section 300.430(d)(3) of the National Oil and Hazardous Substances Pollution Contingency Plan, only chemical- and location-specific ARARs are required to be identified during the RI phase. Section 300.430(e)(9) states that action-specific ARARs should be identified and evaluated in the feasibility study (FS). For sites where presumptive remedies may be appropriate, it makes sense to identify action-specific ARARs when the use of a presumptive remedy appears likely. Accordingly, the Navy identified potential action-specific ARARs for the Tidal Area Landfill. The Navy believes that the identification of action-specific ARARs for the other Tidal Area sites at this stage would be overly speculative, and any ARARs so identified would be too general to be useful. The Navy will identify action-specific ARARs for the R Area Disposal, Froid and Taylor Roads, and Wood Hogger sites in the FS, as appropriate.

11. Comment: **Section 4.2, Preliminary Chemical-Specific ARARs for Site 1 - Tidal Area Landfill, page 4-6; Section 4.3, Site 2 - R Area Disposal, page 4-11; Section 4.4.1, Site 9 - Froid and Taylor Roads, page 4-12; and Section 4.5.1, Site 11 - Wood Hogger, page 4-13 (also Table 4-1): For surface water, the Navy should include National Ambient Water Quality Criteria and note that the most recent version of the San Francisco Bay Basin Plan is dated June 21, 1995.**

The Navy should also include a preliminary list of ARARs for groundwater.

Response: The Navy will add the National Ambient Water Quality Criteria as potential ARARs and update the reference to the Basin Plan.

With regard to groundwater ARARs, please see the response to specific comment 9.

12. Comment: **Section 4.2.3, Action-Specific ARARs for Site 1 - Tidal Area Landfill, page 4-9: Closure requirements for the landfill should include 23 CCR, Chapter 15, Article 5.**

In addition, the Navy should include State Water Resources Control Board (SWRCB) Resolution No. 68-16 Statement of Policy with Respect to Maintaining High Quality of Waters of California.

Response: The Navy will revise the RI to include the appropriate California Code of Regulations (CCR) Title 27 citations, instead of the CCR Titles 14 and 23 citations. The revised citation will include the CCR Title 27 groundwater monitoring requirements.

The Navy asserts that Resolution No. 68-16 is prospective in intent and thus applies to new discharges only in order to maintain existing high-quality waters. As a result, it is not an ARAR for the Tidal Area Landfill site.

13. Comment: **Section 4.3, Preliminary Chemical-Specific ARARs for Soil Sediment for Site 2-R Area Disposal, Soil, and Sediment, page 4-10; Section 4.4.1, Froid and Taylor Roads, page 4-12; and Section 4.5.1, Site 11 - Wood Hogger, page 4-13: TBCs for sediment should include the narrative criteria for toxicity, page 3-4 of the San Francisco Bay Basin Plan, dated June 21, 1995. This narrative applies to sediment, as is paraphrased below:**

"All waters shall be maintained free of toxic substances that are lethal to or that produce other detrimental responses in aquatic organisms . . . include, but are not limited to, decreased growth rate and decreased reproductive success . . . . There shall be no acute . . . chronic toxicity in ambient waters."

Response: When soil and sediment contamination present a risk to aquatic receptors, soil and sediment cleanup goals are derived considering, among other factors, water quality objectives. However, water quality objectives are not ARARs for soil and sediment.

14. Comment: **Section 4.3.2, Location-Specific and Action-Specific ARARs for Site 2 - R Area Disposal, page 4-11; Section 4.4.2, Froid and Taylor Roads, page 4-12; and Section 4.5.2, Site 11 - Wood Hogger, page 4-13: This section should include protection of the following existing and potential beneficial uses, as designated in the San Francisco Bay Basin Plan, dated June 21, 1995:**

- **Ocean, Commercial, & Sport Fishing: Estuarine Habitat**
- **Industrial Service Supply: Fish Migration**
- **Navigation: Preservation of Rare & Endangered Species**
- **Water Contact Recreation: Noncontact Water Recreation**
- **Fish Spawning: Wildlife Habitat**

In addition, SWRCB Resolution 68-16 is considered an action-specific ARAR to protect the existing and potential beneficial uses.

Response: The Navy agrees that the beneficial uses of groundwater and surface water are used to determine the narrative and numerical water quality objectives that should be achieved or protected. However, these water quality objectives are not ARARs for soil and sediment. When soil and sediment contamination present a risk to aquatic receptors, soil and sediment cleanup goals are derived considering, among other factors, water quality objectives.

As stated above in the response to specific comment 10, action-specific ARARs will be evaluated in the FS report, as appropriate.

15. Comment: **Section 5.0, Geology and Hydrology of the Tidal Area Sites: This section provided a good evaluation of hydrogeologic conditions utilizing a series of aerial photos from the site which had not previously been presented. The results of the evaluation of the tidal influence study, the groundwater contours, and geologic cross sections seem to indicate the need for further evaluation of the groundwater before the issue can be closed. The preliminary proposal by the Navy at the June 15th RPM meeting appears to meet the following concerns (see also general comment #2) which may be addressed in the supplemental groundwater work:**

a. ***Section 5.1.1, Geology of Tidal Area Landfill Site, page 5-3:*** **A more detailed discussion of the nature and history of fill in the Tidal Area may be pertinent to preferential pathways and background metals concentrations. Some of this work has already begun with the evaluation of the aerial photos.**

b. *Section 5.2.1, Tidal Influence Survey Results, page 5-7:* The Navy should clarify how the wells were selected to be used in the tidal influence study. Some wells appear to be screened in bay mud, while others were screened in fill or remnant channels. For example, page 5-8 indicates that FTSMW003 and WHSM002, used in the study, did not exhibit significant water fluctuations. However, these wells appeared from the cross-sections to be screened in bay mud. What might have been observed if well FTSMW001, apparently screened in a remnant channel, were used in the study?

A further point illustrating the need for additional hydrogeologic characterization is the statement on pages 5-8 and 5-9 that decreases in surface water were observed during the tidal study at surface water monitoring location SW-4, 1,200 feet from Otter Sluice. "SW-4 was located in a partially filled former natural sluice . . . which may be hydraulically connected to either Otter Sluice or Suisun Bay." This area might be considered a pathway for contaminant movement. The issue of identifying surface water and groundwater interactions might be answered using stable isotope analysis similarly to what was performed for the groundwater analysis at the Litigation Area sites.

There is also a need to clarify whether the wells screened in fill or remnant channels have any direct tidal connection which may act as preferential pathways. My cursory review of the geologic cross sections seem to indicate that wells in the R Area, RADMW002 and RADMW003, and in the Wood Hogger Area, WHSMW003 and WHSMW004, should be evaluated on this issue.

c. *Section 5.2.1, Tidal Influence Survey Results, pages 5-7, 5-8:* The last sentence, page 5-7, indicates that water flows through the gravel berm adjacent to the flap gate in Otter Sluice. The Navy should provide the basis for this finding. If the Otter Sluice flap gate is not effective in minimizing bay flow into the sluice at high tide and water also flows through the gravel berm adjacent to the gate, further consideration should be given to other areas where the gravel berm might be allowing flow (and possible contaminant movement) to and from the sites.

d. *Section 5.2.1, Tidal Influence Survey Results, pages 5-7, 5-8:* The Navy should indicate whether salinity or other physical parameters were measured during the tidal influence study. Is there sufficient physicochemical data to make an evaluation of surface water and groundwater interactions?

e. *Section 5.2.2.1, Hydrology of the Tidal Area Landfill, page 5-10 and 5-11:* **This section states that the filled former artificial drainage channel northeast of the landfill may provide a preferential pathway for groundwater flow along the east side of the landfill, however, there are no existing wells to confirm this. Part of the Navy's proposal in the June 15th meeting was to install one or two additional wells in this area to answer this question. We agree that this is a useful approach to determine groundwater pathways and flow direction.**

f. *Section 5.2.2.2, Hydrology of the R Area Disposal Site, page 5-11:* **As described above, the Navy should provide the basis to the finding that surface water from the R Area flows into Otter Sluice in part by seepage through the levee. As further noted, the effectiveness of the backflow controls of the flap gates in Otter Sluice has not been assessed. This should be evaluated, at a minimum, as part of the issues related to stormwater management compliance.**

Response: The history and source of the imported fill are unknown.

The section will be revised to clarify that the wells used for the tidal influence study were selected to represent conditions across the site and included both wells screened in Bay Mud and those screened in fill.

The tidal fluctuations in the wells screened in fill along Otter Sluice demonstrate the hydraulic connection between Otter Sluice and the R Area and Wood Hogger sites. This connection is further illustrated in the seasonal water level elevation maps (Figures 5-7 through 5-10). As indicated in the response to specific comment 4, water usually flows from Otter Sluice into the R Area and Wood Hogger sites, depending on the season. As a result, the fill between Otter Sluice and the R Area and Wood Hogger sites is a pathway of groundwater flow, but the flow direction is usually into the sites, not away from them.

The text will be revised to clarify that the results are based on the water levels measured in Suisan Bay and Otter Sluice during the tidal influence study.

Salinity was not measured during the tidal influence study. During the RI, total dissolved solids and total suspended solids were measured in surface water samples. This data could be compared to the results from the proposed groundwater sampling to identify possible locations of surface water and groundwater interactions.

Following evaluation of the site conditions and hand auger exploration of the former drainage The Navy concluded that no permeable soils are present in the former drainage channel and wells were therefore not installed.

Please see the response to specific comment 4.

16. Comment: **Section 6.0, Chemical Characterization of the Tidal Area Sites, page 6-3: The Navy should re-evaluate and modify the last two sentences of this section in light of the known information that pesticides were believed to be used at this site and that the Wood Hogger generated substantial quantities of treated wood chips, "Because concentrations of arsenic in Tidal Area soils and sediments are almost universally greater than the PRG, and because this phenomenon was also observed at NWS Concord Inland Area site . . . , relatively elevated arsenic concentrations in soil and sediment samples from the Tidal Area likely represent natural conditions. In addition, there are no known anthropogenic sources of arsenic in the Tidal Area."**

Response: The draft final RI report will mention the potential for arsenic to occur in site soil from both anthropogenic and nonanthropogenic sources.

17. Comment: **Section 6.2.6.3, Organic Compounds in Surface Water, R Area Disposal Site, page 6-23: A number of pesticides were detected sporadically in surface water above the screening criteria. These results may indicate a need for a more comprehensive stormwater monitoring program or additional analyses in the stormwater runoff. This issue should be considered as part of the recommended action for the site. Page 6-24 revised conceptual site model for the R Area indicates that the ". . . major migration pathway for chemicals is likely surface flow from the seasonally flooded area through the culverts into Otter Sluice."**

Response: NWS Concord maintains an active SWPP program independent from the IRP and CERCLA program. The RI will nevertheless comprehensively address contamination in groundwater, surface water, soil, and sediment, and the information will be relayed to NWS Concord for its use in the overall environmental management of the site, including the SWPP program. Furthermore, additional sampling of water and sediment in Otter Sluice is planned as part of the Phase II ecological risk assessment (ERA).

18. Comment: **Section 6.3.3.1, Organic Compounds in Surface Water, Froid and Taylor Roads Site, page 6-29: This section indicates that TPH diesel and motor oil were detected in all surface water samples from the site. As noted in the previous comment, these constituents may represent a potential impact to aquatic receptors or wildlife and may require a modified stormwater management program.**

Response: Please see the response to the previous comment.

19. **Comment:** **Section 6.4.6.1, Organic Compounds in Soil, Wood Hogger Site, page 6-47: Only two composited samples were analyzed for dioxins, which were detected above the residential PRG. The Navy should explore whether further sampling of dioxins is necessary. In addition, VOCs were detected in seven soil borings, which may argue for VOCs analysis in the next round of groundwater sampling. In the June 15th meeting, the Navy agreed to review the organic soil sampling results to determine what analyses other than metals should be performed on the groundwater samples.**

Response: Dioxin was detected in one of the two composite samples. The samples were collected from the area adjacent to the incinerator, which was removed sometime around 1959 and is regarded as being the most likely location where dioxins would be found if polychlorinated biphenyl-treated wood had been burned at the site. Each of the two composite samples was created by the laboratory, which combined soil samples collected from the four corners of a 10-foot square area. The use of composite samples enabled a greater area to be characterized than would have been provided by two discrete samples.

The Navy believes that existing samples are adequate for characterizing the nature and extent of contamination. However, four additional soil samples from the Wood Hogger site will be collected and analyzed for dioxins to support food-chain modeling for the ERA. If these samples contain concentrations that pose a potential risk to human receptors they will be included in the HHRA portion of the draft final RI report.

The Navy did analyze for additional organic parameters during the Tidal Area groundwater sampling, which was conducted in October 1997. A technical memorandum summarizing the groundwater study will be submitted at the end of February.

20. **Comment:** **Section 8.4, Site-Specific Fate and Transport: It would be useful to combine both the human health and ecological COCs in this section rather than keeping them separate. Although the determination of COCs for human and ecological receptors may result in two different lists, the fate and transport will overlap for all receptors and some exposure routes.**

Response: A table will be included in Section 8.0 that identifies contaminants of concern (COC) from both lists.

21. **Comment:** **Section 8.4, Site-Specific Fate and Transport: For the Tidal Area landfill and R Area Disposal Site, transport of COCs through groundwater was assumed to be limited. These statements need to be verified with another round of groundwater sampling, as was proposed in the meeting of June 15th, 1997.**

For the Froid and Taylor Roads site, arsenic was detected in surface water samples and is believed to be more likely to transported by groundwater. Again, confirmation of this statement is necessary.

Lastly, dioxins were not analyzed in surface water samples during the RI, and are believed to have the potential to migrate if desorbed from soil particles into surface water. This statement again argues for some stormwater management or erosion control measures, as well as additional water sampling.

Response: The results of the groundwater sampling, to be submitted in February 1998, should allow verification of the statements in the RI report regarding transport of contaminants in groundwater.

The Navy is not planning to analyze for dioxins in surface water because the most prominent uptake route in wildlife is through food items (although direct accumulation does occur). The Navy will analyze for dioxins in fish and clam tissues from Otter Sluice under the Phase II ERA. Additionally, please see the response to specific comment 17.

22. Comment: **Section 9.1, Tidal Area Sites Hydrology Summary: This section provides a clearly thought-out summary of possible scenarios for water movement through the Tidal Area sites. We hope that the additional groundwater sampling will provide current information to verify the conditions described here.**

Response: Thank you. The proposed groundwater sampling should provide additional information to further explain the hydrology of the Tidal Area sites.

23. Comment: **Section 9.0, Summary and Recommendations, all four Tidal Area Sites: It would be useful to expand the discussion of the results of the qualitative ecological assessment in this section to provide a clearer overall picture of the conditions of the sites. The section need not go in depth into the ERA, since Volume II provides that information. However, some more detail beyond a single statement would be useful, especially since Volume I has been written as a "stand alone" document.**

Some of the results presented concerns or potential threats regarding surface water runoff, erosion, or other routes of migration of contaminants at the sites. Additional recommendations might include those mentioned in general comment #2, such as a modified stormwater management program or additional control measures.

Response: The draft final RI, Summary and Recommendations section will be expanded to provide additional discussion of the results of the qualitative ecological assessment (QEA).

With regard to storm water management, please see the response to specific comment 17.

24. **Comment:** **Section 9.6, Outstanding Issues: As noted throughout this memorandum, we disagree with the statement that it is reasonable to assume that the groundwater beneath these sites is not contaminated and does not need to be investigated further (page 9-15). We suggest this statement be modified in light of the June 15th, 1997 RPM meeting discussions.**

Response: Please see the response to general comment 2.

SPECIFIC COMMENTS - VOLUME II

1. **Comment:** **Section 3.2.3, Vegetation Root Depths: Please provide a reference for the statement on page 3-18 indicating the general guidelines for estimated root depths in upland habitats.**

Response: As stated in the draft RI report, estimates of root depth were based on plant types and the Soil Conservation Service classification of characteristics for soil types, along with the professional judgment of WESCO field biologists.

2. **Comment:** **Section 5.0, Methods of Screening Contaminants: This section should include a discussion of how the Microtox and P450 were used, as well as the WET-acid and WET-DI, in the QEA.**

Response: Because neither Microtox nor P450 provided data suitable for making risk management decisions, the screening process will be revised to focus on primary chemical screening values and food chain modeling using site specific tissue residues.

The Microtox bioassay was used as a general indicator of contamination, not as a sample-specific screening tool. As the discussion in Section 8.3.1 of the draft RI report indicates, Microtox results were poorly correlated with chemistry across the site, and generally did not contribute to the evaluation of risk. Neither Microtox nor p450 results provided the kind of discriminators of risk that one would like to see in toxicity tests. Follow on field work will include whole animal bioassays (in Otter Sluice) and analysis of tissue concentrations elsewhere to provide a better estimate of risk to receptors at the Tidal Area.

Wet Extraction Test (WET)-deionized (DI) and WET-acid data were compared to ambient water quality criteria (AWQC). For additional discussion of extraction data, please see response to EPA Volume II specific comment 32.

3. **Comment:** **Section 5.1.3, Bioaccumulating Chemicals: This section requires a discussion of how chemicals were screened for high bioaccumulation potential.**

Response: The potential for a chemical to bioaccumulate will be described as a function of the octanol-water coefficient (log K_{ow}). The draft final RI report will include a discussion of literature values of log K_{ow} for all detected organic chemicals. In addition, new data on chemical concentrations in tissue will add to the evaluation of selected chemicals in the Otter Sluice, R Area, and Wood Hogger sites.

4. Comment: **Section 7.1.2, Measurement Endpoints: Given the presence of Otter Sluice adjacent to the Tidal Area Sites, as well as several ponded areas, and the observations of herons and egrets, the Navy should indicate why no piscivorous birds were included in the list receptors of concern. This pathway, or guild, is included in the food web model, but was not carried through the analysis of exposed receptors.**

Response: The great blue heron will be evaluated as part of the follow-on work. Tissues of resident benthic fish, such as sculpins or gobies, will be chemically analyzed to support dose calculations for the great blue heron feeding in Otter Sluice. Please see the attached FSA for more detail.

5. Comment: **Section 8.2, Spatial Distribution of Exposure Concentrations: This section utilized Hazard Quotients and Indices to describe areas of possible risk to aquatic receptors. The figures indicate areas where HIs exceed one, more than 10, and the like. It would be useful to include a discussion of the relevance of HI values exceeding one and more than one. My understanding of this issue is that HI values of increasing magnitude may or may not signify a higher magnitude of risk. Conversely, in theory any HI which exceeds one should present a risk to receptors, regardless of the magnitude. Please elaborate with references how these values might be viewed.**

Response: Although both EPA (1997) and DTSC (1996a, 1996b) guidance recommends the calculation of hazard quotients (HQ) and hazard indices (HI), the technical literature does not unequivocally support the use of HQs and HIs to estimate risk (Ingersoll and Others 1997; Tiebout and Brugger 1995; Solana and Others 1986; Urban and Cook 1986). The interpretation of values greater than 1 requires a policy decision as well as a scientific justification. Professional judgment and group discussion among the Navy and regulatory agencies will play a large role in the interpretation of HIs. Given this fact, this section will be revised to reflect the most current version of the draft document "Toxicity Reference Values as Part of a Regional Approach for Conducting Risk Assessments at Naval Facilities in California," prepared by the Navy in May 1997. Relevant sections of that document on calculation and interpretation of HQs will be provided.

6. **Comment:** **Section 8.3, Biological Assessment Screening Tools: Please describe in more detail the significance of the expected and observed results for Micortox and P450.**

Response: As mentioned in the response to Volume II specific comment 2 above, neither Microtox nor P450 results proved useful to the risk assessment. In general, Microtox showed a similar level of biological response throughout the Tidal Area rather than a range of responses correlated to chemical concentrations, as expected. P450 results indicated some degree of exposure to organic constituents, but poor correlation to any specific suite of chemicals.

7. **Comment:** **Section 8.6, Overview of Exposure and Effects Assessment: The first paragraph in this section indicates that the HI approach was used to determine adverse effects to plants and animals. This need to be modified to reflect that the screening criteria represents effects to primarily aquatic invertebrates and fish, since those species are the ones in which much of the criteria was derived for both sediment and AWQC.**

The results of this portion of the assessment seem to indicate impact to aquatic invertebrates and fish. The Navy should consider verifying these estimates from screening criteria, Microtox and P450 with laboratory bioassays using sensitive and relevant test species, or possibly some form of limited-term biological monitoring. Please see also general comment #2. This comment also applies to Section 13.3.2, Summary and Recommendations, Risk to Aquatic Life, page 13-6.

Response: The text will be clarified with respect to which receptors are evaluated by which specific screening criteria. In general, effects-range low and effects-range median are most relevant to benthic invertebrates and plants, and secondarily applicable to fish. Wetland creation values are applicable to all wetland plant and animal species by convention. AWQC are considered protective of all aquatic life. Toxicity reference values were developed for birds and mammals and are allometrically converted for use with specific bird and mammal species.

Please see the response to Volume I general comment 2. The Navy's proposed follow-on ecological work is described in the attached FSA.

8. **Comment:** **Table 13-1, Risk Characterization: Weight-of-evidence, presents a nice tabulation of the QEA estimated risks.**

Response: Thank you.

RESPONSE TO DEPARTMENT OF TOXIC SUBSTANCES CONTROL COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR TIDAL AREA SITES 1, 2, 9, AND 11 NAVAL WEAPONS STATION, CONCORD, CALIFORNIA DATED APRIL 16, 1997

This document presents the U.S. Department of the Navy's (Navy) responses to comments received on July 23, 1997, from the California Department of Toxic Substances Control (DTSC) on the draft remedial investigation (RI) report dated April 16, 1997, for Tidal Area Sites 1, 2, 9, and 11, Naval Weapons Station (NWS) Concord, California.

1. **Comment:** **Ground Water Investigation. The Phase 1A RI Report and associated field work did not include sampling to characterize ground water quality. Page ES-1 of the Report states "*Based on the results of the Phase 1A RI, the need for groundwater sampling at the Tidal Area sites will be assessed, and any necessary groundwater sampling will be conducted during the Phase 1B RI.*" On Page 3-4 the Report states "*No groundwater samples were collected as part of the RI because representative samples could not be collected from the wells that were screened in Bay Mud.*" It is noted that the sites are located on top of a 20 to 70 foot thick interval of fine-grained Bay Sediments comprised of mud, peat, and sand.**

   Recommendation. It is unlikely that shallow ground water has not been contaminated to some degree considering that 33,000 tons of waste were reportedly disposed of at the Tidal Area Landfill between the 1944 and 1979 (reported on Pages ES-1 and 2-13 to include household waste, solvents, acids, paints, creosote, and ordnance). Accordingly, a ground water investigation should be completed to provide sufficient data to support final remedy selection.

   Response: No evidence of groundwater contamination or analytical results to suggest the presence of hazardous materials within the landfill have been found to date. However, the Navy has recently collected groundwater samples from the 23 existing monitoring wells and from two new monitoring wells constructed east of the Tidal Area Landfill. Currently, the Navy is in the process of reviewing the groundwater data and will submit a technical memorandum summarizing the groundwater investigation at the end of February 1998. The technical memorandum will be included as an addendum to the draft final RI report.

2. **Comment:** **Wood Hogger Site Operations. The site description and operational history should be clarified regarding periods of wood burning, chipping and associated disposal.**

Based on information presented on Pages 2-23 and 2-24 of the Report, the following activities and time periods are apparent: 1) by 1950 a sufficient quantity of wood is assumed to have been chipped and disposed in sufficient volume to fill a large part of low lying areas of the site; 2) from some unknown time before 1952 through the early 1970s wood was burned; 3) between 1969 and 1973 wood was chipped; and 4) until 1972 chips were sold offsite.

Recommendation.

a. **The Report should identify why is it suspected that fill extending across the site by 1950 is wood chips and whether or not the assumption was confirmed by soil borings.**

b. **On page 2-24, the Report indicates that some ammunition packing crates used during the Vietnam War had been treated with wood preservatives and that an estimated 20 tons of PCP treated wood may have been disposed of at the site. The Report should provide the following information:**

   (i) **How many cubic yards of wood chips are estimated to equal one ton.**

   (ii) **Whether or not wood treated with PCP or other compounds, including paint, may have been chipped or burned during other periods. If so, the Report should provide the following information:**

   - **The estimated volume or weight of the wood and identification of potential contaminant types;**
   - **Whether or not wood chips were burned;**
   - **Ash disposal method(s) and location(s);**
   - **An estimate of the total volume of ash disposed;**
   - **Whether or not ash was identified in soil borings;**
   - **Available results of chemical analyses of ash samples.**

Response: The parenthetical statement, "suspected to consist of wood chips," in the last sentence of the first paragraph of Section 2.7.4.1 will be deleted because it is incorrect. By 1950, about half of the Wood Hogger site was filled in order to build the site infrastructure; however, wood chipping was not initiated until the late 1960s.

a. The report will be revised to indicate that aerial photographs were used to identify fill areas and to state the RI findings concerning the composition of the fill.

b(i). The revised report will include an estimate of the number of cubic yards of wood chips in a ton.

b(ii). The revised report will indicate that it is not likely that wood chips were burned because the incinerator and hogger were not operated at the same time. In addition, no ash was observed during soil characterization, so ash disposal does not appear to have occurred on site.

3. Comment: **Tidal Area Landfill Site Summary, Conclusions, and Recommendations (Page 9-3). On Page 9-4 the Report states "The results of the human health risk assessment indicate that no further action is warranted at this site. The ecological risk assessment shows that contamination at the Tidal Area Landfill does not present a significant immediate risk to ecological receptors. Currently, a FS is in progress to consider remedial alternatives for the site. The FS is following the presumptive remedy approach, which includes capping and 'no further action' as two alternatives under consideration."**

Consistent with the presumptive remedy strategy, the characterization of contaminants and risk assessments both assume that the waste will be contained. A no further action (NFA) decision would be inconsistent with this strategy. The conclusions and recommendations presented in the Report are based on the results of limited surface and subsurface soil sampling conducted at eight locations around the perimeter of the landfill. No attempt was made to characterize surface or subsurface contamination within the landfill perimeter. This restricted sampling is consistent with the presumptive remedy strategy which assumes waste containment and the associated elimination of several exposure pathways. A baseline risk assessment incorporating all potential exposure pathways cannot have been completed because of the restricted sampling approach completed at the site.

Recommendation.

a. **A NFA decision should be considered to be not supportable based on the site characterization completed at the landfill site.**

b. **A NFA decision should require the support of additional characterization of surface and subsurface soil and waste within the landfill, ground water quality, gas emissions, and an assessment of associated potential health risks.**

Response: The feasibility study assesses both capping and no further action (NFA) using the presumptive remedy approach. A NFA alternative was included because it is required under CERCLA. Selection of a NFA is unlikely because it does not meet remedial action objectives.

RESPONSE TO U.S. ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR TIDAL AREA SITES 1, 2, 9, AND 11 NAVAL WEAPONS STATION, CONCORD, CALIFORNIA DATED APRIL 16, 1997

This document presents the U.S. Department of the Navy's (Navy) responses to comments received on June 18, 1997 from the U.S. Environmental Protection Agency (EPA) on the draft remedial investigation (RI) report dated April 16, 1997, for Tidal Area Sites 1, 2, 9, and 11, Naval Weapons Station (NWS) Concord, California.

GENERAL COMMENTS

1. Comment: **I still have concerns about groundwater contamination transported through possible preferential pathways. The explanation for why groundwater samples were not collected and analyzed was not consistent. Was it because groundwater samples could not be collected from wells screened in Bay Mud, or were determinations made that it was unnecessary due to limited contamination in soil and sediment? An attempt at sampling some of these wells may be warranted, particularly in areas that can be considered "hot spots". In any case, this topic warrants further discussion.**

   Response: The Navy has collected groundwater samples from the 23 existing monitoring wells and from two new monitoring wells constructed east of the Tidal Area Landfill. Currently, the Navy is in the process of reviewing the groundwater data and will submit a technical memorandum summarizing the groundwater investigation at the end of February 1998. The technical memorandum will be included as an addendum to the draft final RI report.

2. Comment: **The rationale for arsenic levels being completely from nonanthropogenic sources may not be accurate; particularly for the R Area and the Wood Hogger sites. Although arsenic is indigenous to these soils at concentrations higher than PRGs, there is evidence that some arsenic may be due to site use and practices. Arsenic is often a constituent in pesticides as well as in wood preservatives, both of which were used at CNWSTA. Although this may not change our risk management decision, it should be clarified.**

   Response: The draft final RI report will mention the potential for arsenic to occur in site soil from both anthropogenic and nonanthropogenic sources.

3. **Comment:** **Since no samples were collected from within the landfill itself, the risk calculated for the landfill is not representative of the true risk. This should be made clear in the text of the document.**

Response: Characterization of the nature and history of the fill in the Tidal Area Landfill was conducted during the site investigation (SI) phase. The contents of the landfill were sampled during the prior SI, and a presumptive remedy (to cap the landfill) has been proposed. Sampling for the RI consisted of surface and subsurface soil sampling conducted around the perimeter of the landfill, to assess whether chemicals may be migrating from the landfill.

It will be clarified in the text of the document that the risk calculations are based on the construction of a landfill cap that will prevent receptors from making contact with the landfill waste. The risk calculations are based on samples taken along the perimeter of the landfill and thus are intended to be representative of risk at the landfill perimeter.

4. **Comment:** **Dioxins were detected in the only two samples analyzed for this compound in the Wood Hogger site. It may be necessary to pursue this contaminant further given the clear potential source from the former incinerator.**

Response: A single dioxin hit was detected in only one of the two composite samples analyzed for dioxins. The dioxin samples were collected form the area adjacent to the incinerator, which was removed sometime around 1959, and is regarded as being the most likely location where dioxins would be found if polychlorinated biphenyl (PCB)-treated wood had been burned at the site. Each of the two composite samples was created by the laboratory compositing soil samples collected from the four corners of a 10-foot square area. The use of composite samples enabled a greater area to be characterized than would have been provided by two discrete samples.

Additional samples will be taken as part of the future ecological sampling program for further characterization of the dioxin contamination at the Wood Hogger site. The data will be used to reassess ecological risk due to dioxin contamination at the site. Furthermore, if dioxins are detected, the human health risk assessment (HHRA) will be revised based on the additional data collected.

5. **Comment:** **The figures should include PRG values for easier comparison. PRGs should be included in the tables which show the proportion of samples above PRGs.**

Response: Preliminary remediation goal (PRG) values will be added to the legend of Exhibits 2, 3A, and 3B, and to the statistical summary tables for soil and surface water.

6. **Comment:** **Appendix L indicates that some data gaps may remain. See specific comments on this section below.**

Response: Comment has been noted.

SPECIFIC COMMENTS

1. **Comment:** **p. ES-3 [Executive Summary, fourth paragraph]: Please define the abbreviation HPCDD and identify this compound as a dioxin.**

Response: The acronym HPCDD will be defined as "heptachlorodibenzodioxin."

2. **Comment:** **p. ES-3 [Executive Summary, fifth paragraph]: This sentence indicates a residential RME hazard index greater than 1 for the Wood Hogger Site. Please identify the contaminant(s) resulting in this designation.**

Response: Based on agency comments, the HHRA will be revised for the draft final RI report. The executive summary will also be revised accordingly. For each of the Tidal Area sites, all contaminants with a hazard quotient (HQ) greater than 1 or contributing to a segregated hazard index (HI) greater than 1 will be identified.

3. **Comment:** **p. 2-16 [Subsection 2.7.1.2, first complete paragraph on page]: The VOCs that are considered naturally occurring should be identified and the rationale for the assumption of their natural occurrence briefly discussed in the text. In accordance with RAGS guidance, organic chemicals should not be eliminated as contaminants of potential concern (COPCs) unless a strong case can be made for their natural or ambient occurrence in site media. Common laboratory contaminants should be included as COPCs if the sample concentration(s) exceed ten times the maximum amount detected in blank samples; if sample concentrations are less than ten times the blank concentration, the blank-related concentration(s) should be considered the sample quantitation limit(s) (SQLs) for the lab contaminant(s). For chemicals detected in blanks that are not considered lab contaminants, site sample results should be considered positive if the concentration in the site sample exceeds five times the maximum amount detected in any blank; samples containing less than five times the amount in any blank should be considered non-detects and the blank concentration(s) as the SQL(s) for that chemical.**

Response: The draft final RI report will be revised to indicate that carbon disulfide was the only volatile organic compound (VOC) detected that naturally occurs in bay environments.

4. Comment: **p. 2-18 [Subsection 2.7.2.2, Site Investigation, third paragraph]: This paragraph mentions filtered surface water samples being collected as part of the SI. Similarly, the descriptions of results of the SI for the other Tidal Area sites contain discussions of surface water sample results (e.g., p. 2-20, paragraph 1) and discuss results for filtered samples. It is unclear if all surface water samples were filtered and if samples for organic chemical analysis were also filtered. Please clarify the text referring to surface water analyses conducted during the RI throughout Subsection 2.6.**

Response: The text will be revised to clarify that during the SI, surface water samples analyzed for metals were filtered while samples analyzed for other constituents were not filtered. For the RI, surface water samples were not filtered.

5. Comment: **p. 2-23 [Subsection 2.7.2.2, Confirmation Sampling, second paragraph]: For this and the other Tidal Area site descriptions in Section 2.7, state the rationale for conducting the confirmation sampling.**

Response: The purpose of the confirmation sampling conducted by the Navy in 1993 was to confirm the presence of chemicals detected during the SI and to evaluate the practical quantitation or detection limits reported by the laboratory for soil and water samples. The draft final RI report will be revised to include this rationale.

6. Comment: **p. 2-28 [Subsection 2.7.4.2, Results of Previous Investigations (Wood Hogger Site 11), Confirmation Sampling]: The summary should identify the number, media, date(s), and locations of samples collected during the CS.**

Response: Two groundwater samples, from wells WHW-3 and WHW-4 and three soil samples were collected from the Wood Hogger site during the confirmation sampling. This information will be included in the draft final RI report.

7. Comment: **Table 5-1 [Tidal Survey Results]: The length of the monitoring period should be included in the table notes.**

Response: The notes for Table 5-1 will be revised to indicate that the tidal survey was conducted from June 23, 1994, through June 30, 1997.

8. Comment: **p. 6-3 [First Section, Last Sentence]: As mentioned in the general comments above, the statement that there are no known anthropogenic sources in the tidal area may be misleading.**

Response: The last sentence of Section 6.0 will be deleted in the draft final RI report.

9. Comment: **p. 6-7 [Subsection 6.1.3, Summary of Chemical Characterization, Organic Compounds in Soil, second paragraph]: It is stated in the first sentence and throughout this section that carbon disulfide occurs naturally in bay sediments. However, Section 2.0, page 2-19, first partial paragraph, indicates that it does not occur naturally in bay environments. Please change the text in the appropriate section.**

Response: The typographical error on page 2-19 will be corrected by removing "do not" from the indicated statement. Carbon disulfide is the only detected VOC that occurs naturally in Bay environments.

10. Comment: **p. 6-8 [Subsection 6.1.4, Revised Conceptual Site Model for Tidal Area Landfill Site, last paragraph]: The second sentence mentions transport of and exposure to asbestos, as does Figure 6-1. Table 6-1 does not specify any asbestos analyses, nor is there a discussion of asbestos analytical results. Please include any asbestos analytical results in this document.**

Response: Because a presumptive remedy to cap the landfill is currently being proposed and was proposed during the time that the Tidal Area RI workplans were being written, asbestos analysis was not included. Air sampling was not conducted during the RI, so asbestos was not analyzed during the RI. The report will be revised to indicate that asbestos will not be of concern once the Tidal Area landfill has been capped.

11. Comment: **p. 6-10 [Subsection 6.2.2, third full paragraph]: Based upon the site investigation information and data, the western border of the landfill site is a potential munitions source. Why were soil samples not analyzed for explosives at this location?**

Response: It is not clear why the western border of the Tidal Area Landfill would be considered a potential munitions source; the potential for the presence of explosive compounds in the Tidal Area Landfill was anticipated during the planning of the RI, and all soil samples collected along the border of the Tidal Area Landfill were analyzed for explosive compounds. In addition, soil samples from the western portion of the R Area Disposal Site, where ordnance casings, canisters, and other debris are visible on the ground surface, were analyzed for explosive compounds.

12. Comment: **p. 6-13 [Subsection 6.2.3.1, Organic Compounds in Soil, Pesticides/PCBs, first paragraph]: It is stated that "pesticides were not detected in subsurface samples." However, no subsurface samples were analyzed for pesticides below the surface samples containing the highest concentration of DDT (RADSB010 and RADSB011). Therefore the above statement is misleading.**

Response: The text will be clarified to indicate that although pesticides were not detected in subsurface soil samples from the R Area Disposal Site, subsurface soil samples were not collected at the two locations with the highest concentrations of total dichlorodiphenyltrichloroethane (DDT) in surface soil.

13. **Comment:** **p. 6-16 [Subsection 6.2.3.2, Inorganic Compounds in Soil, top partial paragraph]: The last sentence of this paragraph indicates that deposition of beryllium can occur "through flooding, ponding, and drying conditions." Although this can occur naturally, it is also likely that this can occur from beryllium that was placed in the landfill as debris. The flooding can carry beryllium from the debris to these water collection areas (low spots), and can then be deposited onto the surface soil when the water evaporates. Please revise this and any other similar discussions to include potential anthropogenic sources of high metals concentrations.**

Response: The discussion of beryllium detections presented on page 6-14 indicates the potential for anthropogenic sources of beryllium. The distribution of beryllium is further discussed on pages 6-16 and 6-17, where the text notes that elevated concentrations are away from known source areas and in low-lying areas. It is the Navy's position that although an anthropogenic source of beryllium is possible the data do not support it, and the beryllium distribution seems to be more likely a result of the site hydrology.

14. **Comment:** **p. 6-20 [Subsection 6.2.5.2, Inorganic Compounds in Surface Water, first paragraph]: The second sentence states that there are "documented disposal areas in the northeast corner...." This is not indicated in Section 2.0 as a source area. However, the southwest corner of the site does contain high metal concentrations. Please clarify or correct this paragraph or Section 2.0.**

Response: This sentence will be revised in the draft final RI report to refer to the "northwest" corner.

15. **Comment:** **p. 6-20 [Subsection 6.2.5.2, Inorganic Compounds in Surface Water, second paragraph]: This paragraph discusses the procedures, the results, and the conclusions. It does not discuss how the results support the conclusion. Is it that for those analytes where surface water screening criteria are exceeded, if the leachate (DI or acid?) is much greater than the surface water concentration, then the source of surface water contamination may be the sediment?**

Response: The Waste Extraction Test (WET) analysis of the sediment was conducted to assess the type and concentrations of metals that would leach from the sediment. Comparisons of the metal concentrations in the leachate from sediment, especially the deionized (DI) water leachate, to the surface water concentrations gives a general assessment of whether metals in the sediment could be contributing to the metals detected in the surface water. If the metal concentrations in the DI water leachate from sediment are much greater than the metal concentrations in surface water, then there is a potential for the sediment to be a source of surface water contamination. The draft final RI report will be revised to include this explanation.

16. Comment: **p. 6-21 [Subsection 6.2.6.1, Inorganic Compounds in Soil, last paragraph]: The statement that "the geographic distribution of elevated concentrations does not strongly suggest an anthropogenic source" is questionable for arsenic. At least half of the locations where arsenic exceeds the ambient concentrations are where past disposal activities have been documented. Please reassess this conclusion and support it further.**

Response: The conclusion will be further supported in the draft final RI report.

17. Comment: **p. 6-34 [Subsection 6.4.1.1, Soil]: It is explained in this section that the depth to Bay Mud was determined while drilling. Were any samples collected from the Bay Mud? Was this depth determination performed at any of the other sites? If so, it is recommended that the rationale for Bay Mud depth determination and sampling/no sampling be discussed at the beginning of Section 6.0.**

Response: This section will be revised to clarify that samples were collected in both the fill and in Bay Mud. This site was the only site where it was necessary to determine the depth to the Bay Mud, because of the historical widespread filling of the site that was necessary to build the Wood Hogger infrastructure. The depth to Bay Mud is discussed and illustrated in the site geology section, Section 5.1.4.

18. Comment: **p. 6-44 [Subsection 6.4.4.2, Inorganic Compounds in Sediment, first paragraph]: The second sentence in this paragraph implies that all inorganic constituents in the previous sentence exceed residential PRGs. Please revise the sentence.**

Response: The sentence will be revised by removing the phrase "Inorganic constituents including."

19. **Comment:** **p. 6-49 [Subsection 6.4.6.3, Surface Water, Inorganic Compounds in Surface Water]: The last sentence states that sediment concentrations have not affected surface water quality, yet Subsection 6.4.5.2 states that the results of sediment WET tests indicate that the iron in Otter Sluice sediments may have resulted in high surface water iron concentrations. Please clarify or revise.**

Response: The last sentence in Section 6.4.6.3 will be revised by inserting the phrase "With the possible exception of iron," at the beginning of the sentence.

20. **Comment:** **p. 6-50 [Subsection 6.4.7, Revised Conceptual Site Model for Wood Hogger Site]: The last sentence of this section appears out of place. Either revise the text or remove the sentence.**

Response: The sentence will be removed.

21. **Comment:** **Table 6-1: Samples from the Tidal Area Landfill Site were analyzed for metals following the WET leachate extractions. Please include these methods on Table 6-1. Also, Subsection 6.1.1 indicates that hexavalent chromium was only analyzed in one sample. Table 6-1 lists hexavalent chromium analysis for all samples. Tables 6-1 through 6-5 should be reviewed for accuracy and completeness and compared to the text for consistency. It should be specified whether usable data were obtained or whether samples were just collected (which may have rejected data associated with them).**

Response: Samples from the Tidal Area Landfill were not subjected to WET leachate extraction and analysis; the text in Section 6.1.1 will be revised. In addition, Section 6.1.1 will be revised to indicate that all soil samples from the Tidal Area Landfill were analyzed for hexavalent chromium. Tables 6-1 through 6-5 will be reviewed and compared to the text for accuracy. A statement will be added in Section 6.0 that all analytical data is usable as qualified.

22. **Comment:** **Table 6-2: Some samples are listed which have no analyses associated with them (e.g., 28IRADSS066, 28IRADSS067). Please explain or remove these from Tables 6-1 through 6-5.**

Response: Table 6-2 lists all samples collected during the RI, including those samples analyzed for ecological parameters (Microtox and Cytochrome P450). Because these analyses were not discussed in volume I of the RI report, they were not included in Tables 6-2 through 6-4; however, the samples associated with the ecological parameters, including 281RADSS066 and 281RADSS067, were not deleted from the tables. The references to these samples will be removed from Tables 6-2 through 6-4 in the draft final RI report.

23. **Comment:** **Table 6-17: Please include an explanation of the footnotes in this table.**

Response: The footnotes will be added to Table 6-17 in the draft final RI report.

24. **Comment:** **p. 7-1 [Section 7.0, Second paragraph]: It should also be noted, if accurate, that the shallow aquifer underlying the Tidal Area does not impact existing or potential future potable aquifers.**

Response: Cross-section C-C' (Figure 2-12) shows that that the landfill is underlain by 50 to 65 feet of clay or silty clay. The silty clay and clay are expected to impede vertical flow of groundwater and to retard or eliminate contaminant transport. Consequently, the shallow water-bearing zone is not expected to have a significant effect on water quality in underlying aquifers.

25. **Comment:** **p. 7-1 [Section 7.0, second paragraph]: It is assumed that the preliminary remediation goals (PRGs) are based on target cancer risks of 1E-06 and target noncancer health hazards, or hazard quotients (HQs), of 1. Please indicate the target risk or HQ.**

Response: PRGs are chemical-specific concentrations in a specific media (soil, tap water, or ambient air) that correspond to a cancer risk of 1×10^{-6} or a noncarcinogenic HQ of 1. This information will be included in the draft final HHRA.

26. **Comment:** **p. 7-2 [Subsection 7.1.1, Data Evaluation, third paragraph]: The CS was so limited that it could not possibly support the conclusions presented. Please revise and caveat the discussion and assumptions about the significance of the CS data.**

Response: This paragraph introduces the structure and content data validation components of the HHRA and RI. It presents no conclusions.

27. **Comment:** **p. 7-3 [Subsection 7.1.1, Data Evaluation, second complete paragraph]: It is unclear if the PRG is the residential soil PRG for total chromium, chromium VI, or the CAL-Modified PRG. At a target risk level of 2E-05 the residential soil PRG could range from 4 mg/kg to 4200 mg/kg, a considerable variation. Please clarify which chromium soil PRG was used.**

Response: A list of EPA Region IX residential and industrial PRGs used to estimate the carcinogenic risks and noncarcinogenic hazards associated with exposure to contaminants of potential concern (COPC) identified at the Tidal Area sites will be presented in the revised draft final HHRA. This list will include the PRG values used to evaluate chromium and the rationale for selection of that value.

28. Comment: **p. 7-3 [Subsection 7.1.1, Data Evaluation, third complete paragraph on page]: As discussed above in the comment for p. 2-16 (Subsection 2.7.1.2, first complete paragraph, third sentence), the SQL(s) for the analytes in the samples should be the blank-related analyte concentration(s).**

Response: The approach used at the NWS Concord Tidal Area sites to evaluate laboratory blanks is consistent with EPA guidelines for organic data review (EPA 1994). If the concentration of a common laboratory contaminant is less than 10 times the blank concentration, the results are qualified as nondetected ("U" qualifier), and the quantitation limit is elevated to the concentration found in the sample. For purposes of the HHRA, the exposure point concentrations (EPC) of each COPC were calculated using positively detected results (all data without qualifiers), estimated values ("J" qualifier), and nondetected results ("U" qualifier). Consistent with EPA guidance, the concentration of each nondetected value was set equal to one-half the quantitation limit for the sample. The approach used to evaluate laboratory blanks will be discussed in the revised HHRA.

29. Comment: **p. 7-3 [Subsection 7.1.1, Data Evaluation, third complete paragraph on page, second sentence]: It is unclear how COPC selection could not have been affected as a result of elevated detection limits. Further clarification seems appropriate, including brief discussions on how the "small portion of the detection limits" exceeding the 1E-04 target risk for residential soil PAHs and SVOCs was dealt with, and if any potential COPCs could have been eliminated due to the high detection limits.**

Response: In the revised HHRA, the sample detection limits (DL) and sample quantitation limits (SQL) will be compared to PRGs for residential land use. The purpose of this comparison will be to identify compounds with DLs and SQLs greater than health-based PRGs; such chemicals could be present at concentrations that potentially pose a health risk, even though they are reported as not detected. The soil DLs and SQLs for most analytes meet the Contract Laboratory Program (CPL) limits and are less than their respective residential PRGs. For analytes for which the DL or SQL exceed the PRG, a discussion of the impact to selection of COPCs and to the results of the HHRA will be provided.

30. Comment: **p. 7-4 [Subsection 7.1.2, Identification of Chemicals of Potential Concern, first paragraph]: As discussed above in the comment for p. 2-16 [Subsection 2.7.1.2, first complete paragraph, third sentence] the approach used to deal with chemicals detected in lab blanks (e.g., common lab contaminants and non-lab contaminants) should also be presented in this section.**

Response: The approach used to evaluate laboratory blanks will be discussed in this section of the revised HHRA. The response to specific comment 28 addresses this issue.

31. Comment: **p. 7-4 [Subsection 7.1.2, Identification of Chemicals of Potential Concern, Item No. 3]: It remains unclear how analytes exceeding the 80/95 LCL in less than 5 percent of the data were addressed. Were analytes in hot spots retained, eliminated, or addressed separately? Were analytes which did not indicate hot spots excluded? Please provide further clarification. To avoid unnecessary confusion, it is recommended that all inorganic constituents whose maximum site concentration exceeded background be included as COPCs.**

Response: Based on California Department of Toxic Substances Control (DTSC) recommendations, the Navy will revise the approach used to estimate ambient levels for the draft final RI report. DTSC no longer recommends the use of the lower confidence limit (LCL) on quantiles (80/95 LCL) to estimate ambient levels. Instead, DTSC suggests using simple estimates of quantiles (the 95th or 99th percentile) to describe the upper range of ambient conditions at the site. The approach for screening COPCs will also be revised to simplify the selection process. If the maximum concentration of a site metal is greater than the ambient level established for the metal, it will be retained as a COPC in the HHRA.

32. Comment: **p. 7-5 [Subsection 7.1.2, Identification of Chemicals of Potential Concern, first bullet at top of page]: The discussion is somewhat confusing. It is assumed that "(B)arium exceeded in five of 131 samples" means that five of the 131 samples had detectable levels of barium that exceeded the 80/95 background concentration. This should be so stated.**

Response: This discussion will be modified to reflect the revised approach for estimating ambient levels and selecting COPCs. The response to specific comment 31 addresses this issue.

33. Comment: **p. 7-5 [Subsection 7.1.2, Identification of Chemicals of Potential Concern, third bullet, Site 11 - Wood Hogger Site]: Since maximum arsenic, chromium and nickel exceeded background or ambient concentrations, it is recommend that they be carried through further evaluation as COPCs. Nickel and chromium could be considered site-related but would be eliminated as COPCs following comparisons with the soil PRGs (assuming no hexavalent chromium [Cr VI] is present). Arsenic, however, should be considered site-related since wood treated with copper arsenate may have been stored at the site as reusable wood, wood scrap, or sawdust. Arsenic should be carried through as a contaminant of concern (COC) since it exceeds both residential and industrial soil PRGs and, consequently could pose a potential health risk to exposed receptors.**

Response: Based on the revised ambient approach recommended by DTSC, if the maximum concentration of a metal is greater than the ambient level established for the metal, it will be retained as a COPC in the HHRA. Based on this approach, arsenic will be retained as a COPC for the Wood Hogger site (Site 11).

34. Comment: **p. 7-6 [Subsection 7.1.3.3, Comparison of Ambient Conditions, last paragraph]: As discussed in the above comment (p. 7-5, third bullet, Site 11), the rationale for eliminating arsenic as a COPC is highly questionable. A case could certainly be made that arsenic is a site-related contaminant since it (copper arsenate) could have been used to treat wood that was stored or disposed at the site and soil samples contained arsenic at concentrations above the 80/95 background level. The estimated incremental cancer risks for residential exposure to arsenic in soils at concentrations of 10.1 mg/kg (surface soil RME) and 37 mg/kg (maximum soil concentration) are 3E-05 and 1E-04, respectively. These are not negligible cancer risks and should not be ignored. It is also unclear how the 80/95 background or ambient concentrations can be compared to values based on a 95 percent UCL of the arithmetic mean (95 UCL). Please clarify. Also, the reference to Subsection 7.1.4 is incorrect; it should be 7.1.2.**

Response: Arsenic will be retained as a COPC for the Wood Hogger site (Site 11).

The 95th percentile upper confidence limit on the arithmetic mean (UCL_{95}) will be used as the EPC for both the ambient data set and site data when comparing the risks associated with ambient levels and site-specific concentrations of metals.

The reference to Section 7.1.4 will be corrected.

35. Comment: **p. 7-7 [Subsection 7.2.1, Exposure Setting and Land Use, second complete paragraph on page]: Regional topography is generally insufficient to determine the groundwater gradient. Hydrologic studies and other information on the surface characteristics that support the conclusion that potable water wells in the Inland Area and west of NWS Concord are not affected should be discussed and cited.**

Response: The gradients in the Tidal Area Sites are inward towards the center of the R Area Disposal.

36. Comment: **p. 7-9 [Subsection 7.2.1.5, Recreational Receptors, last paragraph on page]: Since recreational receptors include sport fisherman, it is unclear why receptors would not be exposed through ingestion of contaminated fish or shellfish. Please clarify.**

Response: Access by fishermen is not likely at Otter Sluice because of security measures and the presence of a tidal gate. Based on these restrictions to Otter Sluice and the fact that it is very difficult to access the Bay from the Tidal Area sites, fish have not historically been caught and eaten by military personnel at NWS Concord. Fishing is also not anticipated to be a future activity at the site.

However, impacts to fish and shellfish associated with contaminants on shore at the Tidal Area sites will be evaluated in the ecological assessment. Analysis of chemicals in fish tissue will contribute to the calculation of doses to the great blue heron, a fish-eating bird. If it is determined that chemical concentrations in fish could be attributed to site-related contamination, the need to evaluate potential health effects associated with human ingestion of fish will be assessed.

37. **Comment:** **p. 7-11 [Subsection 7.2.2.1, Site 1 - Tidal Area Landfill, second complete paragraph]: There is no mention of any data identifying the nature and extent of asbestos in the soils. Please clarify and discuss the nature and extent of asbestos contamination present in the landfill and why asbestos is not carried through the HHRA.**

Response: Characterization of the nature and history of fill in the Tidal Area Landfill was conducted during the SI phase. The contents of the landfill were sampled during prior SI activities, and a presumptive remedy (to cap the landfill) has been proposed. During this RI, surface and subsurface soil sampling was conducted around the perimeter of the landfill to assess whether chemicals may be migrating from the landfill. These samples were not analyzed for asbestos because this substance is not expected to migrate from the landfill. Consequently, the risks associated with asbestos were not evaluated in the HHRA.

38. **Comment:** **p. 7-11 [Subsection 7.2.2.1, Site 1 - Tidal Area Landfill, second complete paragraph]: If there is a potential for Site 1 contaminants to enter Otter Sluice and Suisun Bay then the surface water and fish/shellfish ingestion pathways should be evaluated for Site 1 COPCs. Please explain why these pathways are not included in the HHRA.**

Response: An explanation for the exclusion of the fish ingestion pathway from the HHRA is provided in the response to specific comment 36.

39. **Comment:** **p. 7-12 [Subsection 7.2.2.2, Site 2 - R Area Disposal Site, second paragraph on page]: As discussed in the above comment for Site 1, if there is a potential for R Area contaminants to enter Otter Sluice (and Suisun Bay) then the fish/shellfish ingestion pathway should also be evaluated for recreational receptors. Please explain the omission of this pathway from the HHRA.**

Response: An explanation for the exclusion of the fish ingestion pathway from the HHRA is provided in the response to specific comment 36.

40. Comment: **p. 7-13 [Subsection 7.2.2.3, Site 9 - Froid and Taylor Roads Site, first complete paragraph on page]: Since Site 9 surface water, as well as groundwater, may be draining into Otter Sluice and Suisun Bay, it would seem reasonable that fish/shellfish ingestion for recreational fishermen is another exposure pathway. Please explain why this pathway was not included.**

Response: An explanation for the exclusion of the fish ingestion pathway from the HHRA is provided in the response to specific comment 36.

41. Comment: **p. 7-14 [Subsection 7.2.2.4, Site 11 - Wood Hogger Site, first paragraph on page]: Contaminants in surface water and groundwater draining from Site 11, as well as the other three sites, may be migrating into Otter Sluice, Suisun Bay, and other surface waters at NWS Concord. Consequently, potential receptors may be exposed to these contaminants not only through dermal contact but also through the ingestion of fish and shellfish caught in these waters. Please explain the omission of this exposure pathway.**

Response: Migration of surface water and groundwater contaminants to Otter Sluice and Suisun Bay will be discussed in the draft final RI report.

Incidental dermal contact with surface water is evaluated in the HHRA. The response to specific comment 74 addresses this issue.

An explanation for the exclusion of the fish ingestion pathway from the HHRA is provided in the response to specific comment 36.

42. Comment: **p. 7-14 [Subsection 7.2.3, Exposure Point Concentrations, second paragraph on page]: The RME for nonparametric distributions (assumed to be normal), as indicated in Appendix J, is "a quantile equivalent of the 95th UCL." A brief clarification should be presented in the text defining this statistical value and why it is used.**

Response: Clarification of the statistical methods used to calculate the EPCs will be presented in Section 7.0 (Human Health Risk Assessment) and Appendix H (Calculation of Exposure Point Concentrations and Statistical Summaries) of the draft final RI report.

43. Comment: **p. 7-15 [Subsection 7.2.4, Quantification of Exposure, first complete paragraph]: Table 7-1 does not present equations and parameters, these are presented in Tables 7-2 and 7-3. Please correct.**

Response: The text will be revised to reflect the correct table citation.

44. Comment: **p. 7-15 [Subsection 7.2.4, Quantification of Exposure, second complete paragraph]: How would the inclusion of contaminant uptake into garden produce effect the risk assessment and would it be reasonable under any conditions?**

Response: A quantitative evaluation of the garden produce pathway is beyond the scope of this screening level HHRA. The approach applied at the NWS Concord Tidal Area sites, which was developed in consultation with EPA and DTSC, uses EPA Region IX PRGs to estimate potential risks at the sites. EPA Region IX developed PRGs to address the most frequently encountered exposure pathways. PRGs are not available to evaluate ingestion of homegrown produce.

Because NWS Concord is an open naval base, current activities at the site are limited to industrial operations and maintenance activities performed by base personnel. Residential exposure to contaminants in homegrown produce is very unlikely under these land-use conditions. The need to evaluate potential health effects associated with ingestion of produce will be assessed in the revised HHRA.

45. Comment: **p. 7-16 [Subsection 7.2.4, second complete paragraph]: The preamble to the PRG table is not included in Appendix I. Please add. Also add the reference for the electronic version.**

Response: The entire memorandum from EPA Region IX regarding PRGs will be reproduced in an appendix to the HHRA. In addition, a table presenting all PRGs selected for use in this HHRA will be included in the draft final RI report. This table will include (1) PRGs presented in the published memorandum from EPA Region IX, (2) PRGs obtained from the electronic version, and (3) PRGs derived using EPA Region IX PRG equations and surrogate toxicity values recommended by EPA and DTSC when published toxicity values were not available. A reference for the electronic version of the Region IX PRGs will also be provided.

46. Comment: **p. 7-16 [Subsection 7.2.4, Quantification of Exposure, third paragraph]: Appendix I includes the PRGs, soil screening levels, and toxicity information (toxicity values, CAS No., skin absorption) but not exposure parameter values and PRG equations. Please correct or include this information in Appendix I.**

Response: The entire memorandum from EPA Region IX regarding PRGs, including the exposure parameters and equations used by EPA Region IX, will be reproduced as an appendix to the HHRA.

47. Comment: **p. 7-19 [Subsection 7.3, Toxicity Assessment, first paragraph on page, last sentence]: The meaning of this sentence is unclear. It should be indicated that the COPC toxicity values (slope factors and reference doses) applied in this HHRA are included in the PRG Table presented in Appendix I.**

Response: The Navy will clarify that toxicity values applied in the HHRA are included in the EPA Region IX PRG memorandum reproduced as an appendix to the HHRA.

48. Comment: **p. 7-20 [Subsection 7.3.1.3, third paragraph]: Add to the discussion that speciation of PCBs was not done and therefore the health protective approach is being used; unlike with chromium.**

Response: A discussion of PRC speciation will be presented in the HHRA.

49. Comment: **p. 7-21 [Subsection 7.3.1.3, EPA Toxicity Factors, last paragraph on page]: Appendix H includes toxicity profiles for chemicals that are not COCs (barium, chromium) but does not provide profiles for HPCDD, OCDD, and mercury. Please include toxicity profiles for all identified COCs.**

Response: The Navy will present toxicity profiles for all identified contaminants of concern (COC).

50. Comment: **p. 7-22 [Subsection 7.3.1.4, Chemicals With No EPA Toxicity Values, first paragraph on page]: Table 7-4 provides a list of COPCs without PRGs and their surrogates. There is no table providing a list of chemicals without toxicity values. Please correct.**

Response: The text will be revised to reflect the correct table citation.

51. Comment: **p. 7-27 [Subsection 7.4.1.2, Noncarcinogenic Hazards, second paragraph on page]: It should be noted in the text that segregating HIs is not a simple matter but a potentially complicated analysis of the effects and mechanisms of action of the various COPCs or COCs. All specific data, toxicological information, and assumptions germane to the analysis should be included in the HHRA.**

Response: Consistent with EPA guidance, when the total HI for a site exceeds 1, further evaluation in the form of a segregation of the HI will be performed to determine whether noncarcinogenic hazards area a concern at the site. The approach used at NWS Concord to segregate the HIs will be presented, including the assumptions and critical effects applied.

52. Comment: **p. 7-27 [Subsection 7.4.2, Risk and Hazard Estimates, fourth paragraph on page, last sentence]: The risk characterization results are summarized in Tables 7-5 through 7-10. Please correct the text.**

Response: The text will be revised to reflect the correct table citation.

53. Comment: **p. 7-27 [Subsection 7.4.2, Risk and Hazard Estimates, fifth paragraph on page, second sentence]: Table 7-1 does not present surface water exposure parameter values or equations; this information is presented in Tables 7-2 and 7-3. Please correct the text.**

Response: The text will be revised to reflect the correct table citation.

54. Comment: **p. 7-27 [Subsection 7.4.2, Risk and Hazard Estimates, fifth paragraph, last sentence]: Table 7-3, not Table 7-2, provides risks and hazards. Please correct the text.**

Response: The text will be revised to reflect the correct table citation.

55. Comment: **p. 7-28 [Subsection 7.4.2.1, Site 1 - Tidal Area Landfill, first paragraph]: As discussed in the following comment, health risks and hazards for the residential receptors should be based on COPC RME exposure point concentrations in surface soils (0 to 0.5 feet bgs). Risks and hazards for the industrial receptor should be based on RME exposure point concentrations in subsurface soils (0 to 10 feet bgs). Table 7-5, not 7-4, summarizes the health risks and hazards for the industrial and residential receptors. Please correct text.**

Response: The risks associated with industrial and residential land use will be evaluated using the reasonable maximum exposure (RME) EPCs based on analytical data obtained from both surface soil (0 to 0.5 feet below ground surface [bgs]) and subsurface soil (0 to 10 feet bgs). The response to specific comment 56 provides a more detailed discussion of this issue.

The text will be revised to reflect the correct table citation.

56. Comment: **p. 7-28 [Subsection 7.4.2.1, Site 1 - Tidal Area Landfill, second paragraph]: It appears that the RME concentrations used to estimate risks and hazards for the residential receptor are based on subsurface rather than surface soil concentrations. Residents, particularly children, would more likely be exposed to contaminants in surface soil. The RME surface soil arsenic concentration presented in Table J-1 is 33.8 mg/kg; the subsurface soil concentration is 19.2 mg/kg; the RME surface soil beryllium concentration is 0.51 mg/kg; the subsurface concentration is 0.56 mg/kg. Consequently, the cumulative cancer risk for residents exposed to surface soil contaminants would be 1E-04. Risks due to exposure to arsenic in surface soils would be 9E-05. The HI would be 2.6, and the HQ for arsenic would be 1.5, representing an unacceptable hazard. In addition, since there is no analysis presented supporting the HI segregation, the assumption of additivity should stand. There is also no supporting evidence that arsenic and beryllium are not site related, and surface soil concentrations exceed the calculated 80/95 ambient levels. It should also be noted that residential risks and health hazards do not reflect potential COPC exposure through uptake of homegrown produce, milk, eggs, meats, or shellfish/fish. Please revise the text accordingly by using surface soil concentrations for the residential receptors, and indicate that the COCs pose an unacceptable noncarcinogenic health hazard to potentially exposed future residential receptors.**

Response: The risks associated with industrial and residential land use will be evaluated using the RME EPCs based on analytical data obtained from both surface soil (0 to 0.5 feet bgs) and subsurface soil (0 to 10 feet bgs). Residential exposure to surface soil contaminants is evaluated assuming that the site configuration will remain unchanged in the future. In addition, because construction activities required to develop residential housing at the site in the future would likely disturb existing site conditions, residential exposure to contaminants in subsurface soil is also evaluated. It is assumed that all existing structures, buildings, and paved surfaces are removed during these construction activities. Based on DTSC guidance, it is assumed that soil mixing may occur to a depth of 10 feet bgs during these construction activities.

The approach used to segregate HIs at NWS Concord will be presented in the draft final HHRA, including the assumptions and critical effects applied. If any one segregated HI exceeds1, the discussion will state that there may be a potential for adverse noncarcinogenic health effects to occur.

The text will be revised to indicate that residential risks and health hazards do not reflect potential exposure to COPCs in homegrown produce, milk, eggs, meats, shellfish, or fish. A justification for the elimination of these pathways will be provided.

57. Comment: **p. 7-29 [Subsection 7.4.2.2, Site 2 - R Area Disposal, first incomplete paragraph at top of page]: Table 7-3 provides the surface water results. As discussed above, the residential receptor health risks and hazards presented in Table 7-6 should be based on COPC RME concentrations in surface (0 to 0.5 feet bgs) not subsurface soil (0 to 10 feet bgs).**

Response: The text will be revised to reflect the correct table citation.

The response to specific comment 56 addresses the use of RME concentrations of COPCs in surface and subsurface soil.

58. Comment: **p. 7-29 [Subsection 7.4.2.2, Site 2 - R Area Disposal, first and second complete paragraphs on page (Soil - Residential Scenario)]: As discussed above, the residential risks and health hazards should be based on the surface soil COPC RME. Although the risks and HI are not significantly affected, the text should be revised to reflect that the risk attributable to arsenic, at a concentration of 13.6 mg/kg, is 4E-05, and 2E-06 for both benzo(a)pyrene and dibenz(a,h)anthracene. The HI is 1.6. In addition, unless HI segregation is supported, health hazards due to exposure to multiple noncarcinogenic COPCs should continue to be considered additive.**

Response: The response to specific comment 56 addresses this issue.

59. Comment: **p. 7-29 [Subsection 7.4.2.2, Site 2 - R Area Disposal, last paragraph on page (Sediment - Residential Scenario), second sentence]: As discussed above, since there is no supporting analysis presented in the HHRA for HI segregation, health hazards due to exposure to multiple noncarcinogenic COPCs in sediments should continue to be considered additive.**

Response: The approach used to segregate HIs at NWS Concord will be presented in the draft final HHRA, including the assumptions and critical effects applied. If any one segregated HI exceeds 1, the discussion will state that there may be a potential for adverse noncarcinogenic health effects to occur.

60. Comment: **p. 7-30 [Subsection 7.4.2.2, Site 2 - R Area Disposal, third complete paragraph on page (Surface Water - Recreational Scenario)]: It should be noted in the text that risks and health hazards do not reflect COPC exposure through uptake of potentially contaminated fish and shellfish.**

Response: The text will be revised to indicate that residential risks and health hazards do not reflect potential exposure to COPCs in shellfish or fish. A justification for the elimination of this pathway will be provided.

61. Comment: **p. 7-30 [Subsection 7.4.2.3, Site 9 - Froid and Taylor Road Site, fourth complete paragraph on page, last sentence]: Table 7-8 presents the risk/hazards for Site 9 not Table 7-7. As discussed above for Sites 1 and 2, residential cancer risks and health hazards should be based on COPC RME surface soil concentrations.**

Response: The text will be revised to reflect the correct table citation.

The response to specific comment 56 addresses the use of RME concentrations of COPCs in surface and subsurface soil.

62. Comment: **p. 7-30 [Subsection 7.4.2.3, Site 9 - Froid and Taylor Road Site, last paragraph on page (Soil - Residential Scenario)]: As discussed above, exposure to COPCs in surface, not subsurface, soils should be used to estimate risks and health hazards. Although there is little difference in the risks and health hazards (i.e., the cumulative cancer risk for exposure to surface soil COPCs is slightly higher at 4E-05, and the HI is lower at 1.1), the text should be revised to reflect surface soil arsenic and benzo(a)pyrene RME concentrations.**

Response: The response to specific comment 56 addresses this issue.

63. Comment: **p. 7-31 [Subsection 7.4.2.3, third complete paragraph on page (Soil - Lead)]: The RME surface soil lead concentration of 515 mg/kg should be used for residential receptors. Consequently, the lead concentration exceeds both residential soil lead criteria. The text should be revised to reflect the surface soil lead RME and potential adverse effects (elevated blood lead levels > 10 μg/dl) to exposed residential receptors (primarily children).**

Response: Residential exposure to lead in surface and subsurface soil will be evaluated in the revised HHRA.

64. Comment: **p. 7-31 [Subsection 7.4.2.4, Site 11 - Wood Hogger Site, last paragraph on page, last two sentences carried over to top of p. 7-32]: Table 7-3 presents the surface water risk/hazard evaluation, not Table 7-2. Tables 7-9 and 7-10 present the risks/hazards for soils and sediments. Please correct the text accordingly.**

Response: The text will be revised to reflect the correct table citations.

65. Comment: **p. 7-32 [Subsection 7.4.2.4, Site 11 - Wood Hogger Site, first complete paragraph on page (Soil - Residential Scenario)]: As discussed above for Sites 1, 2, and 9, exposure to COPCs in surface, not subsurface, soils should be used to estimate risks and health hazards. When surface soil RME concentrations for the COPCs are applied for the residential scenario (see Table J-26), the cumulative RME risks are 5E-05 instead of 2E-05, and the HI is 1.1 instead of 0.9. The risk drivers remain benzo(a)pyrene at an RME concentration of 1.3 mg/kg and risk of 2E-05, and dibenz(a,h)anthracene at a risk of 1E-05; but benzo(a)anthracene, at an RME concentration of 1.3 mg/kg, is another COC at an estimated risk of 2E-06. The text should be revised to reflect the risks and health hazards estimated for the surface soil RME concentrations. In addition, it is recommended that arsenic be added as a site-related COPC, since copper arsenate-treated wood may have been stored at the site.**

Response: The response to specific comment 56 addresses this issue.

Arsenic will be retained as a COPC for the Wood Hogger site (Site 11).

66. Comment: **p. 7-32 [Subsection 7.4.2.4, Site 11 - Wood Hogger Site, third complete paragraph on page (Soil - Lead), first sentence]: The surface soil RME lead concentration (108.7 mg/kg) should be used for any comparisons to residential soil lead PRGs or other criteria. Please revise the text to reflect surface soil lead concentrations for the residential receptor.**

Response: The response to specific comment 63 addresses this issue.

67. Comment: **p. 7-33 [Subsection 7.4.2.4, Site 11 - Wood Hogger Site, second paragraph on page (Surface Water - Recreational), second sentence]: It should be noted in the text that RME risks do not reflect exposure to site COPCs through ingestion of potentially contaminated fish or shellfish. It is also unclear what the source of the arsenic concentrations for Site 11 is, since there are no surface water data presented for this site in Appendix J. Please clarify.**

Response: It will be noted in the text that the RME risks do not reflect exposure to site COPCs through ingestion of fish and shellfish. A justification for the elimination of this pathway will also be provided.

Surface water data will be presented in Appendix H (formerly Appendix J) of the draft final RI report.

68. Comment: **p. 7-34 [Subsection 7.4.3, Uncertainty, first paragraph on page, first sentence]: The reference to "greater than 10^{-4}" should be clarified. It is assumed that some detection limits were greater than PRGs based on a cancer target risk of 1E-04, or 100 times the PRGs listed in the EPA Region IX Table.**

Response: The response to specific comment 29 addresses this issue.

69. Comment: **p. 7-34 [Subsection 7.4.3, Uncertainty, third paragraph on page, last sentence]: It should be noted in the text, however, that many potentially noncarcinogenic adverse health effects resulting from exposure to multiple COPCs were dismissed by segregating the effects (without any supporting analysis).**

Response: The response to specific comment 51 addresses this issue.

70. Comment: **p. 7-34 [Subsection 7.5, Risk Assessment Summary, last paragraph on page, last sentence continued onto p. 7-35]: The EPA Region IX PRGs are more accurately defined as back- calculated media concentrations based on a target cancer risk of 1E-06 (1 in 1,000,000) and/or a hazard quotient of one.**

Response: The response to specific comment 25 addresses this issue.

71. Comment: **p. 7-35 [Subsection 7.5, Risk Assessment Summary, first complete paragraph, first sentence]: Exposure to Tidal Area site COCs are not expected to result in significant risks or health hazards to exposed industrial workers. However, based on the results of this HHRA, this is not the case for residential receptors and may not be the case for recreational or other sensitive receptors. Consequently, unlimited land use at the Tidal Area sites would be unacceptable and some form of land use restriction may need to be put in place to limit future development or land use changes. In addition, Subsections 7.5.1, 7.5.2, 7.5.3 and 7.5.4 should be revised as necessary to incorporate recommended revisions identified in the previous HHRA comments.**

Response: Based on agency comments, the HHRA will be revised for the draft final RI report, and the risk assessment summary will be revised accordingly. To aid in the interpretation of risk assessment results, the magnitudes of the estimated carcinogenic risks and noncarcinogenic HIs will be discussed relative to remedial action goals defined by EPA and California Environmental Protection Agency (Cal/EPA). The magnitude of the estimated risks, proposed future land use, and other factors that may affect data interpretation (such as the effect of ambient levels on the calculated risk) will also be considered during the development of recommendations for the site.

72. Comment: **p. 7-37 [Subsection 7.6, Human Health Risk Assessment Conclusions, last paragraph on page]: If the use of EPA Region IX PRGs resulted in significantly overestimating health risks at the Tidal Area sites, then they should only have been used for the initial screening, and a conventional baseline risk assessment should have been completed focusing on the COCs and applying exposure parameters and site-specific land use scenarios that would more accurately reflect current or future human exposure at the four sites. The final conclusion (e.g., "all of the risk estimates are within or at the low end of the target risk range and all hazard indices are less than 1") is incorrect for the residential land use scenario.**

Response: The following information will be added to the conclusion of the HHRA. EPA Region IX PRGs are risk-based concentrations derived using default values for exposure parameters in standardized equations. These conservative (health-protective) default assumptions are designed to address the greatest potential exposures to contaminants assuming industrial and unrestricted (residential) land use. For this reason, PRGs do not represent actual or projected exposures at the Tidal Area sites. Instead, comparison of site concentrations to PRGs provides a framework for screening contaminants in site soils. A screening level risk assessment is typically conducted to determine whether a finding of no further action is warranted. Generally, sites found to have acceptable risks using the PRG screening risk assessment methodology may be eliminated from further consideration. A site concentration that exceeds the PRG does not alone trigger the need for response actions or define unacceptable levels of contaminants in soil. Instead, further evaluation in the form of a site-specific baseline HHRA may be warranted.

Based on agency comments, the HHRA will be revised for the draft final RI report, and the conclusion for the residential land-use scenario will be revised accordingly.

73. Comment: **Table 7-1: The information presented in this table should be discussed further in the text. The RI indicated in Section 2.0 that SI data would not be used for the HHRA, so why is it presented in this table? The SI data, particularly for soil and groundwater, indicates that the contamination at the four sites is much more extensive than the contamination addressed in the HHRA. Data quality problems and laboratory contaminants or other introduced sample contaminants do not fully explain the difference in the two sets of data. Further clarification would seem appropriate.**

Also, why are groundwater results included on this table (column labeled, "Detection in Groundwater Exceeded [sic] Tap Water PRG?" According to p. ES-1 of the Executive Summary, the need for groundwater samples would be assessed by this phase (the Phase 1A RI) and any groundwater sampling deemed necessary would be conducted during the Phase 1B RI. Also, p. 3-4 of Section 3.0 indicates no groundwater samples were collected

and analyzed during this Phase 1A RI, reportedly because "representative groundwater samples could not be collected from the wells that were screened in the Bay Mud." Why were some groundwater samples collected during the 1993 PRC CS? Please clarify.

Response: SI data was not used in the HHRA due to issues related to poor quality. Consequently, Table 7-1 which presents only SI data will be deleted from the HHRA section (Section 7.0) of the draft final RI report. Instead, the SI data will be presented and evaluated in the facility background and setting section (Section 2.0) of the draft final RI report. The discussion on groundwater sampling during the CS will be expanded in the draft final RI.

74. Comment: **Table 7-2: The skin surface area (SA) represents 25 percent of the exposed surface area (exposed head, hands, forearms, and lower legs) usually used for dermal exposure to soils or sediments not due to wading or swimming. For swimming and bathing scenarios it is normally assumed that 75 percent to 100 percent of the skin surface is exposed. The total adult surface area is between 20,000 and 23,000 cm^2, the total surface area for children is somewhere between 7,000 and 9,000 cm^2. Please provide justification for the SA values used in the table. It appears that the exposure frequency (EF) for both adult and child is 1 day/week not 1 day/year as indicated in footnote "e." Please correct.**

Response: The surface water bodies surrounding the Tidal Area sites (Suisun Bay, Hastings Slough, and Belloma Slough) are not accessible for swimming and wading and were not sampled during RI activities.

Surface water samples were collected from Otter Sluice and from standing or ponding water in the R Area Disposal site (Site 2), the Froid and Taylor Roads site (Site 9), and the Wood Hogger site (Site 11). Access to Otter Sluice by base personnel is restricted by a fence located around the perimeter of the sluice and a tidal gate. Based on these access restrictions, and because Otter Sluice is a shallow body of water (3 feet), it is assumed that Otter Sluice is not currently suitable for swimming or wading.

Standing or ponding water are generally present at Sites 2, 9, and 11 during the rainy season only. Consequently, exposure to these surface water bodies is limited to the wet months (October through March) and is not generally possible during the remainder of the year (that is, the dry season).

Although considered unlikely, it is possible that land-use or site conditions could change in the future. For this reason, it was conservatively assumed that an individual may be exposed to contaminants in Otter Sluice and standing water occasionally during recreational activities in the Tidal Area sites. It is further assumed that exposure would be restricted to limited wading because these surface water bodies are too shallow for complete submersion in the water (that is, swimming). The exposure parameters used to evaluate potential contact with surface water were selected based on these site conditions and

assuming limited wading or incidental contact with surface water only. Given that the surface water at NWS Concord is not conducive to swimming, the surface area recommended by EPA would not be appropriate for the Tidal Area sites.

75. Comment: **Table 7-3: Many of the surface water concentrations presented in the table are not consistent with the values presented in Appendix J. Please recheck the arsenic, lead, aldrin, dieldrin, and heptachlor concentrations for Site 2, and the carbon disulfide concentrations for Site 9. Also, please indicate the source of the arsenic concentrations for Site 11 since there are no surface water data presented for this site in Appendix J.**

Based on the surface water concentrations, PC, and slope factor values presented in the table and the LADD exposure parameter values presented in Table 7-2, attempts to confirm the accuracy of the risk calculations resulted in slightly lower risk values. It should also be indicated whether risks and hazards are for adult or child receptors. Please recheck the input parameter values and risk calculations to ensure they are accurate. Also, the permeability constant (PC), or K_p, value in the Cal/EPA (1994) reference is 2.4E-02 not 4.2E-03. Please correct and revise the risk and hazard estimates accordingly.

Response: The COPC concentrations in surface water presented in Table 7-3 will be revised to be consistent with the data presented in Appendix J of the draft RI report (Appendix K of the draft final RI report). In addition, surface water data for Site 11 will be presented in Appendix K (formerly Appendix J) of the draft final RI report. The surface water risk calculations will be checked and revised as necessary.

76. Comment: **Table 7-4: There is a soil PRG for 1,1-biphenyl (see Appendix I p. 02); it is 3.5E+02 based on soil saturation. It is unclear why aniline was used as a surrogate for 4-nitroaniline instead of 2-nitroaniline. Please clarify.**

Response: The health-based PRG for 1,1-biphenyl will be used to calculate a noncarcinogenic HQ in the draft final HHRA. Based on DTSC comments on the draft NWS Concord Inland Area sites HHRA, the PRG for aniline was presented in Table 7-4 as a potential surrogate value for 4-nitroaniline. However, neither 4-nitroaniline nor 2-nitroaniline was detected at the Tidal Area sites. Table 7-4 will be replaced with a table that presents PRGs and surrogate values for only those COPCs identified at the Tidal Area sites.

77. Comment: **Table 7-5: It appears that the RME concentrations presented for the residential receptor are based on subsurface, not surface, soil concentrations. The RME surface soil arsenic concentration presented in Table J-1 is 33.8 mg/kg; the subsurface soil concentration is 19.2 mg/kg. The RME surface soil beryllium concentration is 0.51 mg/kg; the subsurface concentration is 0.56 mg/kg. Consequently, the cumulative cancer risk for residents exposed to Site COCs would be 1E-04. The cancer risk due to exposure to arsenic in surface soils would be 9E-05. The HI would be 2.6, and the HQ for arsenic would be 1.5, representing an unacceptable hazard, segregated or not. Please revise the table accordingly applying surface soil concentrations for the residential receptors.**

Response: The response to specific comment 56 addresses this issue.

78. Comment: **Table 7-6: As discussed above for Table 7-5, the risks and hazards for the residential receptor should be based on surface soil concentrations. However, it should be noted that when surface soil concentrations are applied (see Table J-16) the estimated cumulative risk and HI are not substantially different. Nevertheless, surface soil concentrations should be used to estimate risks and hazards from exposure to Site 2 soil COPCs. Please revise the table accordingly.**

Response: The response to specific comment 56 addresses this issue.

79. Comment: **Table 7-7: The estimated ambient arsenic concentration is based on soil samples, not sediment samples. The fact that an ambient arsenic sediment concentration was not determined should be noted in the table. The analysis for segregating the HI based on effect and mechanism of COPC action was not presented in the HHRA. Without this analysis the noncarcinogenic effects should be considered dose additive. Please revise the table accordingly.**

Response: Ambient levels were not established for sediments at the Tidal Area sites. This fact will be noted on the risk summary tables when sediment COCs are identified.

Consistent with EPA guidance, when the total HI for a site exceeds 1, further evaluation in the form of a segregation of the HI will be performed to determine whether noncarcinogenic hazards are a concern at the site. The approach used at NWS Concord to segregate the HIs will be presented, including the assumptions and critical effects applied.

80. Comment: **Table 7-8: As discussed above for Tables 7-5 and 7-6, risks and hazards for residential receptors should be based on surface soil concentrations. When surface soil concentrations are applied (see Table J-16) the estimated residential cumulative risk and HI are not substantially different.**

Nevertheless, surface soil concentrations should be used to estimate risks and hazards from exposure to Site 9 soil COPCs. The maximum arsenic detection in subsurface soil was 26.6, which exceeds the estimated ambient concentration. The basis for assuming ambient benzo(a)pyrene soil concentrations should be presented. The RME surface soil lead concentration identified in Table J-22 is 515 mg/kg not 319. In addition, the IUEBK blood lead model is the accepted model for determining whether or not the RME soil lead concentration poses a health risk to residential children. Please revise the table accordingly.

Response: As indicated in the Navy's response to specific comment 56, the risks associated with industrial and residential land use will be evaluated using RME EPCs based on analytical data obtained from both surface soil (0 to 0.5 feet bgs) and subsurface soil (0 to 10 feet bgs).

The reference for ambient polynuclear aromatic hydrocarbon (PAH) concentrations will be cited in this section of the draft final RI report.

The lead concentration will be verified and corrected.

The PRG used to evaluate child exposure to lead is based on the blood-lead model developed by DTSC. The Navy understands that the DTSC model is also an accepted model for determining whether or not the RME soil lead concentrations pose a health risk to residential children.

81. Comment: **Table 7-9: As discussed above for Tables 7-5, 7-6, and 7-8, the residential RME soil concentrations are based on subsurface, not surface, concentrations. When surface soil concentrations are applied for the residential receptor, the cumulative risk is 5E-05 with the primary risk driver, benzo(a)pyrene, posing an estimated risk of 2E-05. In addition, arsenic should not have been eliminated as a COPC on the basis of the ambient screening method employed in the HHRA. It is recommended that arsenic be included as a site-related soil COPC even though the RME surface concentration (10.1 mg/kg) appears to be well below the calculated ambient concentration of 24 mg/kg.**

Response: As indicated in the Navy's response to specific comment 56, the risks associated with industrial and residential land use will be evaluated using RME EPCs based on analytical data obtained from both surface soil (0 to 0.5 feet bgs) and subsurface soil (0 to 10 feet bgs).

Arsenic will be retained as a COPC in the HHRA for the Wood Hogger site (Site 11).

82. Comment: **Table 7-11: Since there are several COPCs with risks greater than 1E-06 or HQs greater than unity (see Appendix J Tables J-12 through J-32), it is recommended that the following be added to the list of COCs for the residential scenario: benzo(a)pyrene for Site 1 COCs; and OCDD, benzo(a)anthracene, benzo(k)fluoranthene, indeno(1,2,3,-cd)pyrene for Site 11 COCs. Also, recommend adding beryllium and benzo(a)pyrene as soil RMEs to the Site 1 industrial scenario COC list.**

Response: Based on agency comments, the HHRA will be revised for the draft final RI report, and the list of COCs will be revised accordingly. COCs will be identified for surface and subsurface soil, where appropriate.

83. Comment: **p. 9-3 [Subsection 9.2.1, Chemical Characterization, second paragraph, last sentence]: This sentence states that arsenic, beryllium, and lead were detected at concentrations greater than their residential PRGs and estimated ambient concentrations. However, on p. 9-4, Subsection 9.2.2, Human Health Risk Assessment, second paragraph, the last sentence states that the "...risk is attributable to ambient levels of arsenic and beryllium." Please clarify this apparent contradiction.**

Response: The section will be revised to clarify that the concentrations of arsenic and beryllium in soil are believed to result from nonanthropogenic sources.

84. Comment: **p. 9-4 [Subsection 9.2.2, Human Health Risk Assessment, first paragraph]: As mentioned in the general comments. The risk calculated for the landfill is not representative of the true risk because samples were not obtained from on top of or within the landfill itself. This should be made clear in the text.**

Response: As mentioned in the response to general comment 3, characterization of the nature and history of fill in the Tidal Area Landfill was conducted during the SI phase. The contents of the landfill were sampled during the SI, and a presumptive remedy (to cap the landfill) has been proposed. Based on this approach, it was decided by the Navy in conjunction with the regulatory agencies that no quantitative HHRA or qualitative ecological risk assessment (ERA) was necessary for landfill refuse.

The text will be revised to clarify that the HHRA was conducted using data collected around the perimeter of the landfill and did not include data collected from within the landfill.

85. Comment: **p. 9-5 [Subsection 9.3.1.1, Soil, third paragraph, third sentence]: This sentence states that arsenic (among other metals) was detected at concentrations greater than its residential PRG and estimated ambient concentration. However, on p. 9-7, Subsection 9.3.2, Human Health Risk Assessment, first complete paragraph, the second sentence states that the "...risks can be attributed primarily to ambient levels of arsenic." Please clarify this apparent contradiction.**

Response: The section will be revised to clarify that the concentrations of arsenic in soil are believed to result from nonanthropogenic sources.

86. Comment: **p. 9-6 [Subsection 9.3.2, Human Health Risk Assessment, last paragraph, second sentence]: Does this sentence mean that arsenic is the only contaminant above industrial PRGs? Please clarify.**

Response: For the purposes of this HHRA, a COC is defined as a chemical with a cancer risk greater than 1×10^{-6} or a HQ greater than 1. Because only arsenic is present at concentrations above the industrial PRG at Site 2, it is the only industrial COC for the site. The definition of a COC will be clarified in the revised HHRA.

87. Comment: **p. 9-7 [Subsection 9.3.2, Human Health Risk Assessment, first complete paragraph, last sentence]: Please cite a reference for benzo(a)pyrene ambient concentrations in rural and urban soils.**

Response: The reference for ambient PAH concentrations in urban and rural soil will be cited in this section of the draft final RI report.

88. Comment: **p. 9-9 [Subsection 9.4.1.1, Soil, first complete paragraph, fourth sentence]: This sentence states that arsenic was detected at concentrations greater than its residential PRG and estimated ambient concentration. However, on p. 9-10, Subsection 9.4.2, Human Health Risk Assessment, second paragraph, the second sentence states that the "...risks can also be attributed primarily to ambient levels of arsenic." Please clarify this apparent contradiction.**

Response: The section will be revised to clarify that the concentrations of arsenic in soil are believed to result from nonanthropogenic sources.

89. Comment: **p. 9-10 [Subsection 9.4.2, Human Health Risk Assessment, first paragraph, second sentence]: Does this sentence mean that arsenic is the only contaminant above industrial PRGs? Please clarify.**

Response: For purposes of this HHRA, a COC is defined as a chemical with a cancer risk greater than 1×10^{-6} or a HQ greater than 1. Because only arsenic is present at concentrations above the industrial PRG at Site 9, it is the only industrial COC for the site. The definition of a COC will be clarified in the revised HHRA.

90. Comment: **p. 9-12 [Subsection 9.5.1.1, Soil, first complete paragraph, fourth sentence and Subsection 9.5.1.2, Sediment, second complete paragraph, second sentence]: Both of these sentences state that arsenic and beryllium were detected at concentrations greater than their residential PRGs and estimated ambient concentrations. However, on p. 9-13, Subsection 9.5.2, Human Health Risk Assessment, the fourth paragraph, fourth sentence states that, "The COCs identified for sediments are ambient levels of arsenic and beryllium." Please clarify this apparent contradiction.**

Response: These sections will be revised to clarify that the concentrations of arsenic and beryllium in soil and sediment are believed to result from nonanthropogenic sources.

91. Comment: **p. 9-13 [Subsection 9.5.2, Human Health Risk Assessment, third paragraph, second sentence]: Does this sentence mean that dibenz(a,h)anthracene is the only contaminant above industrial PRGs? Please clarify. Also, please cite a reference for dibenz(a,h)anthracene ambient concentrations in rural and urban soils.**

Response: For purposes of this HHRA, a COC is defined as a chemical with a cancer risk greater than 1×10^{-6} or a HQ greater than 1. Because only dibenz(a,h)anthracene is present at concentrations above the industrial PRG at Site 11, it is the only industrial COC for the site. The definition of a COC will be clarified in the revised HHRA.

The reference for ambient PAH concentrations in urban and rural soil will be cited in this section of the draft final RI report.

92. Comment: **p. 9-15 [Subsection 9.5.4, Preliminary Recommendations and Conclusions, third paragraph, first sentence]: Is no further action appropriate even though the total hazard index for sediment exceeds the threshold value of 1?**

Response: The HHRA will be revised for the draft final RI report based on agency comments, and the recommendations will be revised accordingly.

Consistent with EPA guidance, when the total HI for a site exceeds 1, further evaluation in the form of a segregation of the HI analysis will be performed to determine whether noncarcinogenic hazards are a concern at the site. The magnitude of the estimated risk and hazard, the proposed future land use, and

other factors that may affect data interpretation will be considered during the development of recommendations for the site.

93. Comment: **p. 9-15 [Subsection 9.6, Outstanding Issues, third paragraph, fourth sentence]: As stated in the General Comments, EPA is uncertain whether the conclusion that groundwater is not contaminated and does not need to be investigated further is valid. As discussed in Section 5, pages 5 and 11, filled natural drainage features may act as preferential groundwater pathways which may be contaminated and undiscovered.**

Response: As indicated in the response to general comment 1, the Navy has collected groundwater samples from the 23 existing monitoring wells and from two new monitoring wells constructed east of the Tidal Area Landfill. Currently, the Navy is in the process of reviewing the data, and a technical memorandum will be submitted summarizing the groundwater investigation sometime in February 1998. The technical memorandum will be included as an addendum to the draft final RI report.

APPENDIX J – STATISTICAL DATA SUMMARIES

1. Comment: **Table J-1: Note "c" is unclear and should be revised. In addition, minimum and maximum SQLs should be defined, as should the acronym CTE.**

Response: Note "c" will be revised for the draft final HHRA to read "the value presented is the lesser of the maximum detected concentration and the arithmetic mean."

The acronyms for the minimum and maximum SQLs and CTEs will be defined in the revised HHRA as "sample quantitation limit" and "central tendency exposure", respectively.

2. Comment: **Table J-3: The titles for Tables J-3 and J-4 indicate Site 9 instead of Site 2; please correct.**

Response: The titles of the statistical summary tables will be revised to reflect the correct site.

APPENDIX K – QUALITY CONTROL SUMMARY REPORT

1. Comment: **p. K-2 [Validation Methodology, fourth paragraph]: This paragraph includes 11 samples from wells; however, no RI well sample results are discussed in any of the other sections. What were these results used for?**

Response: Seven of the groundwater samples were collected during confirmation sampling, and the other four were grab groundwater samples from Solid Waste Management Unit 37 in the Wood Hogger site. The grab groundwater samples were taken to examine the groundwater in the vicinity of the wood piles. The details and results of these grab groundwater samples will be presented in the groundwater confirmation sampling technical memorandum.

2. **Comment:** **pp. K-6-end [Subsections 3.3 through 4.4]: Check all table numbers in these sections as they are incorrect.**

Response: The table numbers will be corrected.

3. **Comment:** **p. K-16 [Subsection 4.2, Analyte Identification]: Please identify the location of TICs reported for the Tidal Area RI samples.**

Response: The tentatively identified compounds (TIC) are maintained in the database of RI analytical results, they are not included within the RI document.

4. **Comment:** **p. K-18 [Subsection 5.1, second bullet]: Poor LCS recoveries cannot be attributed to matrix interference problems. Please correct this sentence with the appropriate information. Were LCS recoveries out of control?**

Response: No laboratory control spike (LCS) recoveries were out of control. The sentence will be revised to distinguish between matrix spike (MS) and LCS samples.

5. **Comment:** **Table K-16 [Data Evaluation: Reporting Limits]: Please explain the following minimum reporting limits that do not meet the QAPP reporting limits: aromatic volatiles in soil, surface water VOCs, sediment and soil low-level CLP semivolatiles, and soil and sediment TOC.**

Response: Aromatic volatile compounds in soil were diluted for analysis due to high analyte concentrations, thus raising the minimum reporting limits by the dilution factor.

Surface water VOCs were analyzed by the routine CLP method rather than the low-level method, as low concentrations of VOCs were not expected to be of concern in the surface water. The CLP VOC analytical instrument can typically detect VOCs lower than the contract-required quantitation limit (CRQL), and the laboratory is required to report values below the CRQL for any target compound that is qualitatively identified. These detected results would be "J" qualified according to CLP guidelines and would still be useful for assessment purposes.

The reporting limits listed in the table for sediment and soil low-level CLP semivolatile organic compound (SVOC) analysis are the lowest achievable due to several limiting factors. The minimum reporting limits are partly dependent on the laboratory selected to perform the low-level method. The reporting limits are also affected by the sample matrix, which may have interferences from organic compounds, as indicated by the high total organic carbon (TOC) values and the presence of TICs reported in the Tidal Area samples. It is sometimes necessary to analyze samples with these interferences at a dilution in order to meet analytical requirements.

The reporting limits listed in the quality assurance project plan (QAPP) are based on the wet weight of the samples, whereas sample results are actually reported on a dry-weight basis. Accounting for percent moisture in the quantitation of sediment sample results will raise the wet-weight reporting limits listed in the QAPP considerably.

TOC concentrations detected in most of the soil and sediment samples greatly exceeded the minimum reporting limits specified in the QAPP. The 100 to 135 milligrams per kilogram (mg/kg) reporting limits obtained for TOC are sufficient for site assessment.

APPENDIX L – DATA VALIDATION ISSUES

1. **Comment:** **[Semivolatile Organic Compounds, first paragraph]: PCP was rejected in 18 Tidal Area samples and none were reportedly expected to be associated with site activities. PCP was associated with site activities in the Wood Hogger Site. How many of these rejected data points were associated with the Wood Hogger Site?**

   Response: Five data points from the Wood Hogger site, representing 5 percent of the soil samples, were rejected for pentachlorophenol (PCP) in the low-level semivolatile analyses. The paragraph will be revised to note that PCP was associated with the Wood Hogger Site.

2. **Comment:** **[Semivolatile Organic Compounds, second paragraph]: Please identify the five samples that were affected by the PAH hits in blanks. Were 5 times the blank concentrations greater than the 1E-5 PRGs?**

   Response: The PAH quantitation limits in samples WHSSB008, WHSSB009, WHSSB010, and WHSSB013 were affected. (The fifth sample, RADSB015, had a raised quantitation limit for phenol.) Five times the blank concentration was greater than the 1×10^{-5} PRGs for benzo(a)pyrene in samples WHSSB008 and WHSSB013, and dibenz(a,h)anthracene in sample WHSSB008. The 1×10^{-5} PRG level was used for data validation purposes only. The HHRA used 1×10^{-6} PRGs.

3. **Comment:** **[Semivolatile Organic Compounds, third through fifth paragraphs]: The quantitation limits for the PAHs in particular are of great concern. Please indicate which locations are affected. Also, are there any PAHs which are greater than the 1E-5 PRG level and have not been incorporated into the risk assessment calculations for the whole site?**

Response: As stated in this section, from 7 to 100 percent of the quantitation limits were affected for the PAHs listed. Fifty-seven percent of soil and sediment semivolatile samples were analyzed by the low-level rather than the routine method in order to obtain low quantitation limits for PAHs. Risk assessment calculations used only the 1×10^{-6} PRG level.

4. **Comment:** **[Explosives]: Please state either the number of total explosive samples or the percentage of samples affected. Also, ensure that all other sections include the same type of information.**

Response: The sections will be revised to include the total number of samples and the percentage of samples affected.

GENERAL COMMENTS – VOLUME II: ECOLOGICAL RISK ASSESSMENT

1. **Comment:** **The report was well-written and organized. The exhibits were particularly helpful and allowed quick review of sampling and risk assessment results.**

Response: Thank you.

2. **Comment:** **Four of the screening criteria listed on pp. 5-1 and 5-2 state that the criteria must be exceeded in at least 10 percent of the samples. Commonly, ecological risk assessments have a detection frequency criteria of 5 percent rather than 10 percent. In addition, contaminants of Ecological Concern (COECs) were identified based on the entire RI data set. Contaminants associated with one of the four Tidal Area sites could exceed the criteria at greater than a 10 percent frequency, but not exceed the criteria when using the entire data set. A spatial justification for using the 10 percent criteria should be provided as well as providing a method ensuring that hot spots are not ignored.**

Response: The Navy believes the 10 percent rule is appropriate for screening samples against toxicity-based values, but agrees that the screening should be done on each site independently. At a meeting with EPA in June 1996, EPA representatives also agreed that the 10 percent exceedance was appropriate. For the draft final RI report, revised ambient concentrations will be used and all exceedances will be noted, regardless of their frequency. The sampling location associated with any exceedance of at least one order of magnitude over

the screening value will be identified as a hot spot. Maps showing the degree of exceedance of each COEC will be produced.

3. **Comment:** **The brief discussion of bioavailability in Subsection 12.1.3.2 provides a poor summary of the topic. It appears that a lot of effort was used to evaluate bioavailability using the WET analysis, however the issue is not clearly explained anywhere. We suggest using figures 6-20 through 6-30 to provide a separate discussion of bioavailability in section 12.**

Response: Bioavailability will be more thoroughly discussed in the draft final RI report. Please also see the response to volume II specific comment 18, below.

4. **Comment:** **Section 5.1.3 describes bioaccumulation potential as an important factor for selecting COECs. However, no clear criteria were presented for identifying bioaccumulative chemicals. Please provide an explanation of this procedure.**

Response: The potential for a chemical to bioaccumulate will be described as a function of the octanol-water coefficient (log K_{ow}). The draft final RI report will include a discussion of literature values of log K_{ow} for all detected organic chemicals. In addition, new data on chemical concentrations in tissue will add to the evaluation of selected chemicals in the Otter Sluice, R Area, and Wood Hogger sites.

5. **Comment:** **Some of the water bodies in the Tidal Area have high habitat quality (i.e., Otter Sluice) while others have low habitat quality. We suggest that ecological risks in Otter Sluice and other surface water bodies with high habitat quality be evaluated separately where appropriate.**

Response: Additional field work, described in the Field Sampling Addendum (FSA) attached to these responses, will focus on evaluating receptors in Otter Sluice. Specifically, 13 collocated sediment and surface water samples from Otter Sluice and Froid and Taylor Roads will be collected and analyzed for metals, SVOCs, PCBs, and pesticides. Four of the sediment samples from near the Wood Hogger will also be analyzed for dioxins. Tissues of resident benthic fish and invertebrates from Otter Sluice will also be analyzed.

6. **Comment:** **No clear criteria is presented for evaluating the results of either the Microtox test or the P450 toxicity test. Table 8-1 shows the Microtox test had a mean EC50 at about a 1 percent extract solutions while the P450 test showed a fold induction response ranging from 9 to 169. Do these results indicate that the soil samples are toxic? At what level is the toxicity of significance?**

Response: Neither Microtox nor P450 results provided the kind of discriminators of risk that one would like to see in toxicity tests. Follow-on field work will include whole animal bioassays (in Otter Sluice) and analysis of tissue concentrations elsewhere to provide a better estimate of risk to receptors at the Tidal Area.

7. **Comment:** **As mentioned with regard to human health risk associated with the landfill, an evaluation of ecological risk associated with the landfill is not representative of true risk because no sampling was done on the landfill. This should be clarified.**

Response: As discussed above in the response to volume I comment 3, characterization of the nature and history of the fill in the Tidal Area Landfill was conducted during the SI phase. The contents of the landfill were sampled during the SI, and a presumptive remedy (to cap the landfill) has been proposed. Based on this approach, it was decided by the Navy, in conjunction with the regulatory agencies, that no quantitative HHRA or qualitative ERA was necessary for landfill refuse.

The text will be revised to clarify that the ERA was conducted using data collected from around the perimeter of the landfill and did not include data collected from within the landfill. Ecological risks posed by chemicals that may have migrated from the landfill to the R Area are being evaluated in the ERA.

The landfill is presently the subject of an FS, and so is not included in any additional field work under the RI. Any additional ecological evaluation will be performed as part of the FS report. Data from soil samples collected during the SI will be presented and discussed in the draft final RI report.

8. **Comment:** **In section 13, Summary and Recommendations, it is stated that if the diked wetland in the R Area is restored to its former status as a tidal wetland, potential links between the existing diked wetland with known contamination and the Suisun Bay must be evaluated. What is the likelihood that the R area will be returned to its original tidal wetland status?**

Response: The Navy has no plans at this time to restore tidal action to the R Area.

SPECIFIC COMMENTS – VOLUME II: ECOLOGICAL RISK ASSESSMENT

1. **Comment:** **p. 2-18 [Subsection 2.6.1.2, Site Investigation, paragraph 3]: This paragraph mentions filtered surface water samples being collected as part of the SI. Similarly, the descriptions of results of the SI for the other Tidal Area sites contain discussions of surface water sample results (e.g., p. 2-20, paragraph 1) and discuss results for filtered samples. It is unclear if all surface water samples were filtered and if samples for organic**

chemical analysis were also filtered. Please clarify the text referring to surface water analyses conducted during the RI throughout Subsection 2.6.

Response: The text will be revised to clarify that during the SI, surface water samples analyzed for metals were filtered using a 0.45 micron filter; samples analyzed for other constituents were not filtered. For the draft RI report, no surface water samples were filtered.

2. **Comment:** **p. 2-21 [Subsection 2.6.2.2, Confirmation Sampling, paragraph 4]: For this and the other Tidal Area site descriptions in Subsection 2.6, state the rationale for conducting the confirmation sampling.**

Response: The purpose of the confirmation sampling conducted by the Navy in 1993 was to confirm the presence of chemicals detected during the SI and to evaluate the practical quantitation or detection limits reported by the laboratory for soil and water samples. The draft final RI report will be revised to include this rationale.

3. **Comment:** **p. 2-29 [Subsection 2.6.4.2, Confirmation Sampling, paragraph 4]: To be consistent with the other Tidal Area site descriptions contained in Subsection 2.6, please state the number of confirmation samples that were collected.**

Response: Two groundwater samples, from wells WHW-3 and WHW-4, and three soil samples were collected from the Wood Hogger site during the confirmation sampling. This information will be included in the draft final RI report.

4. **Comment:** **p. 4-1 [Subsection 4.1.1, Soil Investigation, paragraph 3]: State the maximum depth of soil samples used in the assessment.**

Response: The maximum depth of soil samples collected was 10 feet bgs. But, only samples collected from the upper 2.5 feet of soil were evaluated for the qualitative ecological assessment (QEA).

5. **Comment:** **p. 4-5 [Subsection 4.2.1, Soil/Sediment Parameters, paragraph 1]: Provide the rationale for selecting waste extraction tests at the locations shown in Exhibit 3.**

Response: Samples collected for analysis of ecological parameters, including WET samples, were randomly selected from the R Area Disposal, Froid and Taylor Roads, and Wood Hogger sites. A subset of soil samples was analyzed with the WET to evaluate the bioavailability of chemicals in soil.

6. **Comment:** **p. 4-5 [Subsection 4.2.1, Soil/Sediment Parameters, paragraph 2]: This paragraph refers to Figure 4-2 for the location of Microtox and Cytochrome P450 sample locations. Figure 4-2 was not included in the document. Exhibit 3 shows the toxicity test locations. Please correct this inconsistency.**

Response: The text will be revised to refer to Exhibit 3.

7. **Comment:** **p. 5-1 [Section 5.0]: This section could benefit from a figure that depicts the steps in the primary and secondary screening process.**

Response: Such a figure will be included in the draft final RI report.

8. **Comment:** **p. 5-1 [Section 5.0, paragraph 2]: As stated in the General Comments, selection of COECs using the entire RI data set may have resulted in the omission of chemicals as COECs that may be significant contaminants in an individual site. Since Section 2.0 clearly suggests that different sets of contaminants may be associated with the four sites within the Tidal Area, it would be more appropriate to select COECs within each site. The evaluation of risks to receptors that forage over the entire Tidal Area would include COECs listed for all the sites.**

Response: The Navy agrees that COECs should be screened site by site. Please see the response to volume II general comment 2.

9. **Comment:** **p. 5-1 [Subsection 5.1, Primary Screening]: As stated in the General Comments, the use of the "at least 10 percent of the samples" factor in the COEC selection criteria requires justification.**

Response: The Navy believes that using 10 percent exceedance of screening values is appropriate for selecting COECs at the Tidal Area sites. At a meeting in June 1996, EPA representatives also agreed that the 10 percent exceedance was appropriate.

10. **Comment:** **p. 5-2 [Subsection 5.1.2.1, Regional Water Quality Control Board Wetland Cover Criteria, paragraph 4]: This section states that the RWQCB wetland cover values will be used to screen contaminants in the wetland soil. However, cover values exist for relatively few chemicals, and as stated in Subsection 6.1.1 and 6.2.1, ER-L and ER-M values are used to select COECs when cover values are unavailable. Either modify the text in Subsection 5.1.2.1 to state that soil screening values will be either the cover values or ER-Ls (with preference for the cover values) or modify Subsections 6.1.1 and 6.2.1.**

Response: Section 5.0 will be revised to indicate that soil screening values will be the California Regional Water Quality Control Board (RWQCB) wetland cover values, when available, or effects range-low (ER-L) values when wetland cover values are not available.

11. **Comment:** **p. 5-3 [Subsection 5.1.2.2, Effects Range-Low and Effects Range-Median Values, paragraph 2]: This paragraph does not clearly state whether the ER-L or ER-M will be used to select COECs. The ER-Ls would be most appropriate to use as screening values.**

Response: The text will be clarified to indicate that ER-L values were used to select COECs.

12. **Comment:** **p. 5-4 [Subsection 5.1.2.3, U.S. Environmental Protection Agency Ambient Water Quality Criteria, paragraph 1]: Although aluminum does have a freshwater chronic AWQC of 87 µg/L, that value is not presented in Table 5-2. DDT also has a chronic marine and freshwater AWQC of 0.001. Several chemicals lacked chronic AWQC, but do have acute AWQC (i.e., aldrin and BHC). It is recommended that these acute AWQC be used as is or modified to a chronic value using an appropriate factor.**

Response: The freshwater chronic ambient water quality criteria (AWQC) for aluminum and the marine and freshwater chronic AWQC for DDT will be added to Table 5-2 and Section 6.0. In general, water samples will be screened against the lower of the freshwater or marine chronic AWQC, based on RWQCB guidance on brackish habitats. When neither freshwater nor marine chronic values are available, acute values may be used as a point of comparison. The Navy will review appropriate toxicity literature to interpret water concentrations of chemicals for which no criteria exist.

13. **Comment:** **p. 5-4 [Subsection 5.1.3, Bioaccumulating Chemicals]: Although this section states that bioaccumulation potential will also be used to select COECs, no specific criteria for determining if a chemical is considered to be bioaccumulative are presented. An appropriate criterion could be a log K_{ow} of 4.0, which has been used to identify bioaccumulative chemicals in the Great Lakes (*EPA. 1994. Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors. July 1994. EPA-822-R-94-002*).**

Response: Please see the response to volume II general comment 4. The Navy appreciates the reference provided, and will review the appropriate portions.

14. **Comment:** **Table 5-2: The meaning of NA as stated at the bottom of the table is "screening value not available." This suggests that NA should be used in the AWQC columns for chemicals not having AWQC. Instead, chemicals without AWQC have blanks in the AWQC columns while NA is used in the maximum detected column for Chromium III and VI. Please edit the table.**

Response: Table 5-2 will be edited and revised.

15. **Comment:** **p. 6-4 [Subsection 6.1.1.1, Aluminum, paragraph 2]: This paragraph states that aluminum was not selected as a COEC because the soil pH was relatively high. Application of such criteria should be clearly defined in Section 5.0.**

Response: Section 5.0 will be revised to include a section describing other considerations, such as pH and salinity, in selecting COECs.

16. **Comment:** **p. 6-5 (6-3?) [Subsection 6.2]: It would be helpful if a table, such as Table 6-1, was presented for the pesticides and PCBs that summarized the screening results.**

Response: A table summarizing the screening results for pesticides and PCBs will be included in the draft final RI report, along with a map of all detected pesticide results.

17. **Comment:** **Tables 6-3 and 6-4: It is recommended that these tables be modified to include all of the inorganic chemicals shown in Tables M-10, M-11, and M-12 in Appendix M. It would match the text more closely.**

Response: Only those inorganic constituents that were detected and for which screening values exist (freshwater chronic or marine chronic AWQC) were included in Tables 6-3 and 6-4. However, for completeness, all detected chemicals will be included in the table, regardless of the availability of screening values.

18. **Comment:** **p. 6-25 [Subsection 6.1.2.20, Summary of Inorganic Constituents in WET-acid and WET-DI Extractions]: The list of COECs provided at the bottom of the page appear to be incomplete. For example, Table 6-3 shows that arsenic, nickel, and silver exceeds the AWQC in greater than 10 percent of the samples. While barium does not have an AWQC, it was detected in all samples and should have been selected as a COEC. Provide justification for not selecting these chemicals as COECs or include them on the COEC list.**

Response: The discussion on page 6-25, immediately above the list of selected COECs, provides justification for not selecting all constituents that were detected in more than 10 percent of the samples at concentrations exceeding the screening criteria. The rationale is as follows:

All chemicals detected in soil, sediment, and surface water will be screened against ambient values, wetland cover values, or AWQC, respectively. However, chemicals detected in WET-DI and WET-acid extractions are evaluated differently than those in primary environmental media. The actual list if COECs will likely change due to the revised ambient values recommended by the regulatory agencies and the designation of COECs for each site independently. However, the rationale for designating COECs in various media will not change. The rationale for excluding chemicals from consideration as COECs in extraction samples follows:

Soil and sediment are potential secondary sources of chemicals. Soil and sediment samples were screened against ambient and wetland cover values, respectively. A chemical that does not exceed these primary screening values cannot be considered a COEC in extraction samples. Extraction techniques strip chemicals from the soil matrix to a degree beyond what is expected in nature. The rationale for calculating background values for soil presupposes that those values pose no site-specific risk to receptors. Likewise, sediments containing chemicals concentrations less than wetland cover values are presumed safe for all wetland receptors. Therefore, a chemical that poses no risk to receptors in primary media cannot reasonable be treated as a COEC in extraction samples.

Table 6-3 summarizes the inorganic constituents that exceeded the AWQC in extraction test results. For the WET-DI extractions, several inorganic constituents, including arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc, exceeded the AWQC at some locations. These nine constituents, as well as beryllium and thallium, were also detected in the WET-acid extractions at concentrations exceeding the AWQC. Beryllium, cadmium, chromium, copper, lead, mercury, and zinc were considered COECs for the extraction samples. Arsenic, nickel, and silver were not considered COECs for extraction samples even though they exceeded the AWQC because these inorganic constituents were not considered COECs in soil and sediment (see Section 6.1.1). Thallium was not considered a COEC because it was not detected in at least 10 percent of the total samples at concentrations exceeding the AWQC.

Inorganic constituents that did not have screening criteria but were detected in more than 10 percent of the extraction samples included aluminum, barium, cobalt, manganese, and molybdenum. These constituents were not considered COECs in soil and sediment, and so were not considered COECs for extraction samples. Only vanadium was considered a COEC for extraction samples because it was also identified as a COEC in soil and sediment.

19. Comment: **p. 6-29 [Subsection 6.1.3.14, Nickel, paragraph 4]: The concept of a regional background concentration for nickel in San Francisco Bay is introduced in this section. This criterion was not described in Section 5.0. Either retain nickel as a COEC and discuss the San Francisco Bay background issue in the uncertainty analysis (Section 12.0) or provide a clear criterion in Section 5.0.**

Response: Section 5.0 will be revised to include a description of other considerations in selecting COECs. Regarding uncertainty about the status of nickel as a COEC, the Navy considers available information on nickel adequate to support a discussion of regional ambient concentrations of nickel in San Francisco Bay. The ER-L and effects range-median (ER-M) for nickel are clearly inappropriate as indicators of risk in San Francisco Bay, since regional background concentrations of nickel exceed these effects ranges. The wetland cover value of 140 parts per million (ppm) partially reflects regional background concentrations. Data from the Regional Monitoring Program will be included in the draft final RI report to justify the exclusion of nickel as a COEC at the Tidal Area sites.

20. Comment: **p. 6-31 [Subsection 6.1.3.20, Summary of Inorganic Constituents in Surface Water, paragraph 2]: Nickel was found to exceed the AWQC in greater than 10 percent of the samples, but was not selected as a COEC because of the relatively high background concentration in San Francisco Bay. This selection criterion was not defined in Section 5.0. Either retain nickel as a COEC and discuss the San Francisco Bay background issue in the uncertainty analysis (Section 12.0) or provide a clear criterion in Section 5.0.**

Response: Please see the response to the previous comment.

21. Comment: **p. 6-34 [Subsection 6.2.1.1, Dioxins and Furans, paragraph 4]: This paragraph states that dioxins were retained because of their high bioaccumulative potential. How was the bioaccumulative potential determined?**

Response: In the draft RI report, no quantitative evaluation of bioaccumulation was performed. The statement that dioxins have a high bioaccumulative potential was based on professional judgment and common knowledge. Please see the response to volume II general comment 4 for additional information on bioaccumulating chemicals.

22. Comment: **p. 6-41 [Subsection 6.2.1.2, Summary of Pesticide Detections, paragraph 3]: Endrin ketone, gamma-chlordane, and mirex were not selected as COECs based upon their frequency of detection despite the fact that these chemicals are considered to be bioaccumulative. This is inconsistent with the criteria presented in Section 5.0.**

Response: All detected chemicals will be rescreened site by site using a clearly supported definition of bioaccumulation, as described in the response to volume II general comment 4.

23. Comment: **p. 6-42 [Subsection 6.2.1.4, Semivolatile Organic Chemicals]: This section and Table 6-8 shows that PAHs exceeding screening concentrations at a frequency of less than 10 percent were selected as COECs. This is inconsistent with the criteria presented in Section 5.0. Either revise the criteria presented in Section 5.0 or make the screening presented in Subsection 6.2.1.4 consistent with the Section 5.0 criteria.**

Response: The discussion of PAHs will be revised to be consistent with Section 5.0.

24. Comment: **p. 6-46 [Subsection 6.2.1.6, Volatile Organic Compounds]: Please clarify why carbon disulfide was not selected as a COEC when it was detected in 19 percent of the samples and did not have a screening value.**

Response: Carbon disulfide is naturally occurring in the San Francisco Bay and is not considered a priority pollutant. The reason for the exclusion of this chemical as a COEC will be added to the text.

25. Comment: **Table 6-11: This table is somewhat contradictory and confusing. For example, aluminum was detected in soil at concentrations exceeding the ambient limit, did not have a screening value and was not selected as a COEC. However, beryllium had the same information and was selected as a COEC. This table should be modified to show the ambient screen, the risk-based screen (preferably a single risk-based screen for each matrix - i.e., the lower of the cover value or ER-L for soil and the lower of the marine or freshwater value for surface water), and a column of additional criteria so that the logic for selection of the COECs can be easily followed.**

Response: Table 6-11 will be revised to clarify the COEC screening process.

26. Comment: **p. 6-54 [Subsection 6.3, Summary of COECs Identified for the Tidal Area Sites, paragraph 2]: This paragraph states that COECs for use in food chain modeling were selected from the comprehensive COEC lists based upon availability of toxicity data. Where is the evaluation of the availability of toxicity information presented?**

Response: Additional documentation of available toxicity information will be provided in the draft final RI report. Extensive toxicity profiles are collected in the draft "Development of Toxicity Reference Values as Part of a Regional Approach for Conducting Risk Assessments at Naval Facilities in California," prepared by the Navy in May 1997.

27. **Comment:** **Figures 6-20 to 6-30: Figures showing antimony and beryllium concentrations for the Froid and Taylor Road site are not provided. Are they missing or were antimony and beryllium not detected at this site?**

Response: Figure 6-20b shows the results for antimony detected in bulk chemistry and extractions at the Froid and Taylor Road site. Since only one sample analyzed for WET-acid from the Froid and Taylor Road site contained detectable concentrations of beryllium, no figure was provided for beryllium.

28. **Comment:** **p. 7-3 [Subsection 7.1.2, Measurement Endpoints, paragraph 5]: One of the measurement endpoints described at the bottom of the page, as well as in Table 7-1, is the comparison of soil concentrations to benchmarks for invertebrates and plants. This seems incongruous with the COEC selection process that used sediment quality values as the risk-based benchmark. Is it possible that chemicals which are toxic to plants or soil invertebrates could be eliminated from the COEC list based upon a comparison to sediment quality values? If this is true, the evaluation of phytotoxic effects and adverse impacts to soil-dwelling invertebrates is possibly incomplete.**

Response: Chemicals in sediment were screened against the wetland creation cover values as described in the response to RWQCB volume II specific comment 7. The current use of these values as screens for sediment disposal in wetland areas indicates that they are considered protective of wetland resources, including plants and invertebrates.

29. **Comment:** **p. 7-4 [Subsection 7.2, Conceptual Site Model for the Tidal Area Sites]: Neither the text of this section nor Figure 7-1 provides a complete CSM for the site. The CSM must describe a source term, migration pathways, receptors, and exposure routes. The CSM must provide justification why migration pathways and exposure routes are incomplete or insignificant. Much of this information can be found in various other parts of the assessment, but they need to be brought together in the CSM so the rationale for excluding specific migration pathways and exposure routes is clear. It would be appropriate to provide justification of why site-specific impacts to Suisun Bay were not evaluated in this assessment in the CSM.**

Response: Section 7.0 will be revised to provide a more detailed discussion of the conceptual site model (CSM) for the Tidal Area sites.

30. **Comment:** **p. 7-6 [Subsection 7.2.2, Critical Receptors or Indicator Species (Terrestrial Vertebrates)]: This section identifies six vertebrate species as critical receptors that will be evaluated using food-chain models. Please provide justification for these selections.**

Response: The work plan did not specifically address the selection of higher trophic level receptors. However, the Navy expanded the draft RI report to include food-chain analysis of representatives of several major feeding guilds, including mammalian herbivores and carnivores, as well as several avian guilds. The draft final RI report will include a wading bird, the great blue heron, to represent an avian piscivore guild. The draft final RI report will also include a more thorough explanation of the selection of assessment and measurement endpoints.

Taxa reported to use the habitats at the Tidal Area were considered possible assessment endpoints. Protection of the population was used as the endpoint for all species except those for which the individual is the unit of protection due to their federal or state threatened or endangered status. By definition, assessment endpoints have ecological, toxicological, and societal importance (EPA 1992). Several site-specific factors influenced the selection of endpoints, including the occurrence, ecological significance, conservation status, life and natural history characteristics, and potential toxicological susceptibility of receptors; the known and potential contaminants present and their mechanisms of toxicity; and the spatial and temporal patterns of potential exposure.

Taxa selected as assessment endpoints were chosen to represent surrogates for ecologically important groups of receptors. Species that inhabit NWS Concord all or part of the year were selected over migratory species within a feeding guild; it is reasonable to assume that if resident species are shown not to be at risk, migrants are safe from contaminants at the site as well. Native taxa representative of important ecological guilds were chosen as endpoints for the protection of major ecological niches in Tidal Area habitats. Some taxa selected as assessment endpoints are rare and valued by society, as evidenced by their conservation status. Toxicological concerns also guided the selection of endpoints; the presence of metals and metalloids as COECs requires that exposure to plants and lower trophic level receptors be evaluated. Some bioaccumulating contaminants, such as dioxins, are of concern because of the increased exposure of higher-level receptors. Endpoints were chosen to represent risk posed through all major exposure pathways considered important at the site.

31. **Comment:** **p. 8-1 [Section 8.0, Exposure and Effects Assessment, paragraph 3]: This section states that HIs will be calculated for inorganic and organic chemical groups separately. Please provide justification for this grouping.**

Response: The use of HQs is widespread in ecological assessments, and is recommended in both state and federal guidance (DTSC 1996a, 1996b; EPA 1997). However, the technical literature is replete with criticisms of this approach, particularly as the basis for risk estimates (for example, see Tiebout and Brugger 1995). Summing individual HQs to arrive at a HI is even more problematic, as the assumptions of additivity are rarely justified. DTSC guidance leaves it up to the user to decide whether grouping by target organ, mode of action, or chemical class is warranted (DTSC 1996a, page 45). The

Navy, in consultation with regulatory agencies throughout the design phase of this ERA, decided to group the HQs by chemical class; this approach is consistent with both DTSC (1996a, 1996b) and EPA (1997). The technical literature (Ingersoll and Others 1997; Tiebout and Brugger 1995; Solana and Others 1986; Urban and Cook 1986) suggests that screening level evaluations of complex chemical mixtures may benefit from a summation of HQs for chemicals that produce adverse effects by the same toxic mechanism. Although mode of action varies within the two classes of chemicals (organic and inorganic), the separation clearly captures the inherent differences in toxic mechanisms for these two chemical groups.

32. Comment: **p. 8-1 [Section 8.0, Exposure and Effects Assessment, paragraph 4]: The paragraph states that the soluble fraction of the COEC provided by WET extraction analysis is appropriate for assessing risks from the bioavailable fraction in a screening-level assessment. We suggest that the screening-level risks be estimated only on the total concentrations of chemicals and that the results of WET analysis be presented in the uncertainty analysis. This is particularly true since it is difficult to compare soil/sediment screening values expressed in mg/kg with ambient water quality criteria expressed in mg/L.**

Response: Weakly bound contaminants are expected to enter the soluble phase during the deionized water extraction. In general, the metals most easily extracted (such as in an aqueous extraction) tend to be the most bioavailable (Newman and Jagoe 1994). The WET-DI extraction simulates exposure of an organism to metals in the aqueous environment, sediment, or in saturated soils.

In contrast, the dilute hydrochloric acid (HCl) extraction (WET-acid) leaches out the more tightly bound inorganic contaminants and may more closely represent the fraction expected to enter the solute phase over longer periods of time or in acidic environments. Dilute strong acids, such as those employed in the WET-acid extraction, have minimal selectivity for the various absorbents since they may remove metals from sediments both by competitive exchange and by partial dissolution of absorbents. Dilute HCl allows a partial fractionation of metals in sediments, releasing both inorganic- and organic-associated metals, while leaving the silicate matrix relatively intact (Luoma and Bryan 1981). Dilute HCl extractions remove the exchangeable metals sorbed on carbonate, organic, and sulfide phases, as well as oxides and hydroxides of manganese and iron (Agemian and Chau 1976). Tessier and Others (1984) have shown correlations between acid extractions of easily extracted metals and tissue levels in mollusks, indicating that the bioavailability of metals is inversely related to metal binding strength.

The screening process will be better clarified in the draft final RI report. The Navy maintains that, although comparison of extraction data to AWQC is conceptually attractive because the AWQC are promulgated numerical values,

strict interpretation of exceedances is problematical. In lieu of modeling bioavailability of chemicals based on extraction data, the Navy plans to collect tissues of plants, invertebrates, fish, and rodents to measure directly the bioaccumulation of chemicals by receptors at the sites.

33. Comment: **p. 8-2 [Subsection 8.2, Spatial Distribution of Exposure Concentrations, paragraph 1]: It is unclear if HQs and HIs are calculated for just COECs or for all detected chemicals. Review of Tables Q-1 and Q-2 in Appendix Q suggests that HQs and HIs were calculated for all detected chemicals (e.g., Subsection 6.1.1.3 states that arsenic is not a COEC while Table Q-1 shows an HQ for arsenic). Chemicals not identified as COECs should be eliminated from the HQ and HI tables.**

Response: HQs and HIs were calculated for all detected constituents that had screening values; however, in the draft final RI report, calculations of HQs and HIs will be limited to COECs.

34. Comment: **p. 8-4 [Subsection 8.2.1, Hazard Indices for Soil and Sediment, paragraph 3]: The last sentence of this paragraph needs to be modified.**

Response: The word "then" will be deleted from the sentence.

35. Comment: **p. 8-8 [Subsection 8.2.3, Surface Water Hazard Indices]: This section presents HQs and HIs for chemicals that were not identified as COECs in Section 6.0 (e.g., iron). HQs and HIs should not be calculated for chemicals that are not identified as COECs.**

Response: The Navy concurs. In the draft final RI report, calculations of HQs and HIs will be limited to COECs.

36. Comment: **p. 8-12 [Subsection 8.3.1, Microtox]: As stated in one of the general comments, it is unclear how results of the Microtox test are to be evaluated. Specific criteria must be provided so that the reader can easily interpret the test results.**

Response: The Microtox bioassay was used as a general indicator of contamination, not as a sample-specific screening tool. As the discussion in Section 8.3.1 of the draft RI report indicates, Microtox results were poorly correlated with chemistry across the site, and generally did not contribute to the evaluation of risk.

37. Comment: **p. 8-12 [Subsection 8.3.1, Microtox, paragraph 2]: This paragraph describes significant correlations between Microtox and lead, nickel, arsenic, and chromium. These correlations do not appear in Tables 8-3 or 8-4. Please provide a table showing all correlations.**

Response: Tables of correlations will be provided in the draft final ERA.

38. Comment: **p. 8-13 [Subsection 8.3.2, Cytochrome P450 Analysis: Background and Results]: As stated in one of the general comments, it is unclear how results of the P450 test are to be evaluated. Specific criteria must be provided so that the reader can easily interpret the test results.**

Response: Results of the hydrocarbon-inducible Cytochrome P450 analysis did not indicate any clear trends in toxicity, and so were not considered major contributors to the risk assessment. Expected correlations between chemical concentrations and bioassay test results were apparently confounded by the complex mixture of chemicals in the samples. The draft final RI report will include a survey of recent literature on the appropriate use of Microtox and P450 bioassays in ERA.

39. Comment: **Table 9-1: There may be an error in the units for some of the values. For example, for aluminum the range of total concentration is 0.5 - 10 percent, whereas the high or toxic value is 1 - 5 µg/g. Please check the units.**

Response: All units will be checked for accuracy.

40. Comment: **Table 9-3: This table should list all the COECs, including the organic chemicals, whether they have a benchmark value or not. Why does nickel appear in the table when it was not identified as a COEC? Please provide a footnote for DL.**

Response: The table will be modified as suggested. Nickel should have been excluded from the table, as suggested. DL stands for detection limit.

41. Comment: **p. 9-5 [Subsection 9.3, Comparison with Benchmark Values, paragraph 2]: Table 9-3 shows that the maximum detected concentrations of antimony, barium, nickel, silver and thallium exceeded the benchmark values, but they were not identified as posing a potential adverse effect. Presumably this conclusion was reached because these chemicals were not identified as COECs. Please clarify.**

Response: The evaluation of COECs will be clarified in the draft final RI report. The Navy is also evaluating benchmarks provided by California Department of Fish and Game.

42. Comment: **p. 9-5 [Subsection 9.4, Risk Characterization Summary for Plants, paragraph 4]: The last sentence states that organic chemicals do not appear to be clearly linked to adverse plant effects. On what is this conclusion based? Please provide justification for this conclusion.**

Response: Literature citations will be provided.

43. **Comment:** **p. 10-2 [Subsection 10.1.3, Solid-Phase and Organic-Extraction Microtox, paragraph 3]: The last sentence of this paragraph states that few, if any, risks appear to be likely, based upon Microtox results. The rationale for this conclusion is unclear. As stated in several other comments, no clear criteria are presented to evaluate the results of the Microtox test. Those criteria should be presented in Subsection 8.3.1 or some other appropriate section.**

Response: Please see the response to volume II specific comment 36.

44. **Comment:** **p. 10-3 [Subsection 10.1.14, Cytochrome P450, paragraph 1]: This paragraph presents the results of the P450 tests, but does not make a clear statement about whether these results suggest that there is a risk to soil-dwelling organisms. As stated in several other comments, no clear criteria are presented to evaluate the results of the P450 test. Those criteria should be presented in Subsection 8.3.2 or some other appropriate section.**

Response: Please see the response to volume II specific comment 38.

45. **Comment:** **p. 11-5 [Subsection 11.1.1, Deterministic Food-Chain Model]: This page provides an interpretational framework for the HQs calculated using High and Low TRVs. Please clarify if this interpretation was also a product of the BTAG review process. If not, additional justification for the framework is required.**

Response: This section will be revised to reflect the most current version of the draft document "Toxicity Reference Values as Part of a Regional Approach for Conducting Risk Assessments at Naval Facilities in California," prepared by the Navy in May 1997. Relevant sections of that document on the calculation and interpretation of HQs will be provided.

46. **Comment:** **p. 11-12 [Subsection 11.2, Exposure Assessment]: Much of the discussion on complete or significant exposure routes presented in this section would more appropriately belong in the CSM presented in Subsection 7.2.**

Response: The discussion of exposure routes will be moved to a newly expanded CSM section.

47. **Comment:** **p. 11-16 [Subsection 11.2.1.1, Exposure Point Concentrations in Environmental Media, paragraph 1]: Instead of providing an argument for why the TEF evaluation was not done, it would be more appropriate to simply do the evaluation using the TRV for dioxin to demonstrate that risks are below a level of concern.**

Response: In addition to problems associated with using toxicity equivalency factors (TEF) for dioxins, small sample size limited the food-chain evaluation of dioxin in the draft RI report. In the follow-on work described in the FSA, additional soil samples will be collected from the Wood Hogger area. Dioxins will also be measured in sediment and tissue (clam and fish) from Otter Sluice, providing a more representative estimate of bioaccumulation and food-chain transfer.

48. **Comment:** **p. 11-19 [Subsection 11.2.1.4, Exposure Point Concentrations in Vertebrates (Mouse, Vole, and Meadowlark, paragraph 2)]: This paragraph states that body burdens in prey receptors were assumed to be equivalent to the daily dose estimates calculated for the prey species. Is this a conservative approach? A technical justification for this approach is required. Also, non-site-specific bioaccumulation factors can be obtained for most of the COEC for at least mammals from the published literature. Since site-specific information is lacking, it would be preferable to use the highest published soil-to-receptor bioaccumulation factor whenever possible.**

Response: The Navy has agreed to collect and analyze rodent tissues to obtain more appropriate values for use in the food-chain model. Biomagnification factors from the literature will be used only if tissue concentrations are unavailable.

49. **Comment:** **p. 11-19 [Subsection 11.2.2, Trophic-Transfer Coefficients, paragraph 4]: A technical justification (e.g., appropriate literature citation) for using the generic 10 percent TTC is needed before this approach can be deemed acceptable.**

Response: To be consistent with the NWS Concord Litigation Area QEA using similar food-chain models in similar habitats, the use of a trophic transfer coefficient (TTC) will be eliminated.

50. **Comment:** **p. 13-9 [Subsection 13.5.1, Tidal Area Landfill]: It is difficult to draw any conclusions about the landfill since no samples were collected from directly beneath or within the landfill.**

Response: As mentioned in the response to volume I general comment 3, characterization of the nature and history of the fill in the Tidal Area Landfill was conducted during the SI phase. The contents of the landfill were sampled during the SI, and a presumptive remedy (to cap the landfill) was proposed. Based on this approach, it was decided by the Navy, in conjunction with the regulatory agencies, that no quantitative HHRA or qualitative ERA was necessary for landfill refuse.

The test will be revised to clarify that the ERA was conducted using data collected from around the perimeter of the landfill and did not include data collected from within the landfill.

51. **Comment:** **Table 13-1: This table would be more useful if it was organized by site.**

Response: The table will be reorganized by site.

REFERENCES

Agemian, H. and A.S.Y. Chau. 1976. "Evaluation of Extraction Techniques for the Determination of Metals in Aquatic Sediments." *Analyst*. Volume 101. Pages 761 through 767.

California Department of Toxic Substances Control (DTSC). 1996a. "Guidance for Ecological Risk Assessment (ERA) at Hazardous Waste Sites and Permitted Facilities. Part A: Overview." DTSC, Human and Ecological Risk Division (HERD). July 4.

DTSC. 1996b. "Guidance for ERA at Hazardous Waste Sites and Permitted Facilities. Part B: Scoping Assessment." DTSC, HERD. July 4.

Ingersoll, C.G., T. Dillion, and G.R. Biddinger (Editors). 1997. *ERA of Contaminated Sediments*. SETAC Press. Pensacola, Florida.

Kennish, M.J. 1997. *Practical Handbook of Estuarine and Marine Pollution*. CRC Press. Boca Raton, Florida.

Luoma, S.N. and G.W. Bryan. 1981. "A Statistical Assessment of the Form of Trace Metals in Oxidized Estuarine Sediments Employing Chemical Extractants." *The Science of the Total Environment*. Volume 17. Pages 165 through 196.

Newman, M.C. and C.H. Jagoe. 1994. "Ligands and the Bioavailability of Metals in Aquatic Environments." J.L. Hamelink and Others, Editors. *Bioavailability: Physical, Chemical, and Biological Interactions*. Lewis Publishers. Boca Raton, Florida.

Solana, R.P., J.W. Chinchilli, W.H. Carter, and R.A. Carchman. 1986. "Estimation and Analysis of the Concentration-Response Surfaces Associated with Multiple-Agent Combinations." *Toxicology and Applied Pharmacology*. Volume 13. Pages 533 through 544.

Tessier, A., P.G.C. Campbell, J.C. Auclair, and M. Bisson. 1984. "Relationships Between the Partitioning of Trace Metals in Sediments and their Accumulation in the Tissues of the Freshwater Mollusk *Elliptio complanata* in a Mining Area." *Canadian Journal of Fish and Aquatic Science*. Volume 41. Pages 1,463 through 1,472.

Tiebout, H.M. and K.E. Brugger. 1995. "ERA of Pesticides for Terrestrial Vertebrates: Evaluation and Application of the U.S. Environmental Protection Agency's (EPA) Quotient Model." *Conservation and Biology*. Volume 9. Pages 1,605 through 1,618.

U.S. Environmental Protection Agency (EPA). 1992. "Framework for ERA." EPA/630/R-92/001. February.

EPA. 1997. "ERA Guidance for Superfund: Process for Designing and Conducting ERAs. Interim Final." EPA Environmental Response Team. Edison, New Jersey. June 5.

Urban, D.J. and N.J. Cook. 1986. "Hazard Evaluation Division Standard Procedure: ERA." EPA/540/9-85/001. Office of Pesticide Programs, EPA. Washington, DC.

RESPONSE TO CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, HUMAN AND ECOLOGICAL RISK DIVISION COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR TIDAL AREA SITES 1, 2, 9, AND 11 NAVAL WEAPONS STATION, CONCORD, CALIFORNIA DATED APRIL 16, 1997

This document presents the U.S. Department of the Navy's (Navy) responses to comments received on July 23, 1997, from the California Department of Toxic Substances Control (DTSC), Human and Ecological Risk Division (HERD) on the draft remedial investigation (RI) report dated April 16, 1997 for Tidal Area Sites 1, 2, 9, and 11, Naval Weapons Station (NWS) Concord, California.

GENERAL COMMENTS

1. **Comment:** **Human Health Risk Assessment is Generally Good: The assessment of human health is thorough and well presented. In general, risks and hazards are adequately estimated. We require only minor changes as noted in the Specific Comments below.**

   Response: Thank you.

2. **Comment:** **Ecological Risk Assessment Is Not Acceptable: The ecological risk assessment included too few chemicals and too few assessment endpoints; food chain modeling used invalid assumptions; and critical habitat was not assessed. Too many detected chemicals were dismissed as chemicals of potential ecological concern (COPEC). Piscivorous birds are not represented among the indicator species. Otter Sluice is neither characterized nor assessed adequately. Doses are assumed erroneously to be equal to body burdens for food chain modeling. Tissues of animal food items were not assayed for residues of contaminants.**

   Response: The screening level ecological risk assessment (ERA) was based on the qualitative ERA work plan developed by the Navy, with input form the regulatory agencies. The work plan was approved by the regulatory agencies in March 1995. The ERA field work and evaluation was conducted in strict accordance with the work plan. The ERA was designed as a screening level assessment intended to minimize cost while providing useful screening level information. The Navy recognizes that the methodology used have left some data gaps. The Navy's proposed follow-on field efforts were presented to the EPA and California Regional Water Quality Control Board (RWQCB) at a meeting on December 18, 1997. The Navy has agreed to conduct a limited follow-on field investigation to fill data gaps identified during the comment period. Additional data collection designed to augment and validate the original risk assessment is described in the attached field sampling addendum (FSA). Follow-on field work includes collection of tissues for validation of the

food-chain model, additional soil and sediment sampling, aquatic bioassays, and surveys for special status species. Details of the Navy's proposed field work are in the attached FSA.

Topics in the FSA include (1) additional sediment, soil, and surface water chemistry to further characterize Otter Sluice, Froid and Taylor Roads site, and the Wood Hogger; (2) larval fish bioassays to test the toxicity of sediments in Otter Sluice; (3) analysis of tissue residues of several taxas in Otter Sluice, the R Area, and the Wood Hogger; and (4) biological surveys focused on special status species.

The great blue heron has been added to the list of receptors to be evaluated as a representative of the piscivorous avian feeding guild.

3. **Comment:** **The Approach to Ecological Risk Assessment Must Be Re-examined: The ecological risk assessment does not conform with guidance published by the Department of Toxic Substances Control (DTSC). We have no guideline for a "screening" ecological assessment. A scoping assessment examines whether a site has both COPEC and usable or potentially usable habitat. If the answer is yes to both, one proceeds to a Phase I Predictive Assessment, wherein the figure of merit is the hazard quotient. Phase I is usually followed by a Phase II Validation Study, wherein field measurements are made to verify predictions of toxicity or highly uncertain predictions of lack of toxicity. The current document fulfills the requirements of a scoping assessment, but it fails as either a predictive assessment or a validation study. HERD did not review the work plan for this ecological assessment.**

Response: Comment noted.

The draft and draft final qualitative ecological assessment (QEA) work plan were submitted to all regulatory agencies including DTSC for review and comment. DTSC reviewed the draft QEA work plan and submitted comments to the Navy in November 1993. The Navy submitted written response to all agency comments for the draft and draft final QEA work plan.

4. **Comment:** **Recommendation: The Navy has made a good beginning, but critical data have not yet been collected, especially regarding sediments in Otter Sluice and analysis of tissues of prey items. Thus, the Navy's recommendations for no further action are premature at best. The Navy and regulatory agencies should meet to agree on the scope of additional investigations to complete a Phase I predictive assessment and a Phase II validation study according to DTSC guidelines.**

Response: The response to general comment 2 addresses this issue.

SPECIFIC COMMENTS - HUMAN HEALTH RISK ASSESSMENT

1. **Comment:** **Presentation of Analytical Data: This comment refers to Tables 6-7 through 6-10 and Tables M-1 through M-12. The number of detections is presented, but this is not nearly so valuable as frequency of detection. Please summarize these data as follows: name of chemical, frequency of detection expressed as a ratio of two whole numbers (# detected/ #analyzed), range of detection limits, range of detected values, type of distribution (if tested), mean, standard deviation, and, for Appendix M, columns of the various ecological screening criteria.**

   Response: The name of the chemical, frequency of detection (number detected per number analyzed), range of detection limits, range of detected values, type of distribution, and mean are provided in the statistical summary tables (Tables J-1 through J-11) in Appendix J of the draft RI report. These statistical summary tables will be moved to Appendix J of the draft final RI report. It is not clear why DTSC would also prefer this information to be provided in Tables 6-7 through 6-10. Tables of ecological criteria will be updated in the draft final RI report.

2. **Comment:** **Hexavalent Chromium, Sec. 6.4.3.2, pp. 6-41 ff.: Please describe in the text and a table the results of analytical determinations for Cr^{+6}. The Navy states on page 7-3 of Appendix K that 68% of analytical results for Cr^{+6} were rejected. They state further on page 5 of Appendix L that this high proportion of rejected results "limit[s] the ability to detect and distinguish hexavalent chromium, the risk driver, from trivalent chromium." Given other evidence of the presence of other wood treatment products, this subject deserves careful consideration in Chapters 6 and 7 of the main text.**

   Response: The impact on the human health risk assessment (HHRA) of rejecting a significant proportion of the hexavalent chromium analytical results will be discussed in Section 7.0 of the report.

3. **Comment:** **Quality Control Summary, Appendix K: The following comment applies to Tables K-3, K-5, K-7, K-9, K-10, K-14, K-15, and K-16. Each row is for one chemical, but one of the column headings is "Number of Analytes." Could this be "Number of Analyses"? Please clarify.**

   Response: The column headings will be retitled "Number of Analyses."

4. **Comment:** **Comparison of Metals with Ambient Conditions, Sec. 7.1.2, p. 7-4, and Appendix E: Guidance on comparing sites with ambient conditions can now be downloaded from HERD's home page: http:\\www.cwo.com/~herd1/herd.htm. We suggest using simple estimates of quantiles, rather than lower confidence limits on quantiles, as comparators representing the upper range of ambient conditions. This should produce more successful screens than the one described for the Tidal Area Landfill Site (p. 7-4). Also, the Wilcoxon Rank Sum test is more effective than the fourth rule shown on page 7-4 for detecting an upward shift in the mean of a population (i.e., contamination). The combination of the Wilcoxon Rank Sum test and the use of a single value to represent the upper range of ambient conditions allows effective testing for both mean and extreme values.**

As for the background data set itself (App. E, Sec. E.4.1 ff.), we recommend using cumulative probability plots with dummy values inserted for non-detected values. Dummy values should be selected to be equal to or less than the lowest detected value. This will reduce noise in the plots and greatly simplify identifying the type of underlying distribution of data, especially when frequency of detection is low. Outliers are more easily identified graphically than by using a rule of three standard deviations. These techniques are described in the guidance mentioned above.

Response: To complete the draft final HHRA on schedule, the Navy has revised the ambient approach based on written agency comments dated July 23, 1997, and the method agreed on during a subsequent telephone discussion with DTSC. The telephone discussion with DTSC was initiated by the Navy on October 29, 1997, to request clarification of DTSC comments. Based on agency recommendations, the probability plots have been revised for metals with low frequency of detections using proxy or "dummy" values (the lowest detected value) as surrogates for non-detected values. During the discussion on October 27, 1997, it was agreed that use of these proxy values would allow the Navy to establish a 99th percentile ambient level for purposes of comparison with site metals concentrations. Applying the revised approach, a contaminant of potential concern (COPC) is retained in the HHRA if the maximum concentration of a site metal is greater than the ambient level (99th percentile value) established.

The methods recommended by the agencies to evaluate ambient metals concentrations have changed several times during preparation of reports for the NWS Concord Inland Area and Tidal Area sites. In an effort to obtain concurrence from the regulatory agencies, the Navy has revised the ambient approach used at NWS Concord each time the agencies have recommended a new ambient approach. Consequently, the ambient approach at NWS Concord has been revised three times. It is the Navy's understanding that the revisions required to incorporate the most recent agency comments (April 16, 1997 and October 30, 1997) in the ambient approach will be the final changes necessary.

5. **Comment:** **Construction Worker Scenario, Sec. 7.2.1, p. 7-8: Our practice at other Navy facilities in California has been to include inhalation of volatile organic vapors from shallow groundwater in the exposure setting for construction/utility workers. Please evaluate this pathway, especially for R Area Disposal Site (p. 7-12).**

Response: Groundwater samples were not collected and analyzed during the RI because the results of prior investigations did not indicate that contaminants were present in groundwater. As indicated during the remedial project managers' (RPM) meeting held on June 15, 1997, the Navy plans to collect groundwater samples from the 23 existing monitoring wells and two new monitoring wells to be constructed east of the Tidal Area Landfill to confirm the absence of contamination. The need to evaluate potential exposure of construction workers to contaminants through inhalation of volatile organic vapors from shallow groundwater will be assessed when the groundwater sampling effort has been completed.

6. **Comment:** **Exposure to Groundwater, Sec. 7.2.1.5, p. 7-9: In Section 2.5.3 the Navy describes the discharge of shallow groundwater at the Tidal Area Sites to nearby surface waters. Please consider this as a possible complete pathway for the recreational setting.**

Response: Based on several rounds of groundwater measurements during both wet and dry seasons, the dominant direction of groundwater flow appears to be from surface water bodies toward the northern part of the R Disposal Area. As a consequence, groundwater discharge to surface water does not appear to be a major transport mechanism in the tidal area sites. The tidal influence study conducted during the draft RI report showed limited tidal influence in wells adjacent to Otter Sluice, and therefore limited interaction between groundwater and surface water in a narrow band adjacent to Otter Sluice. Groundwater and surface water interaction will be discussed in greater detail in the Confirmation Groundwater Sampling Technical Memorandum.

7. **Comment:** **Secondary Pathways, Sec. 7.2.4, p. 7-15: Regarding dioxins and PCBs, the Navy states that not addressing the secondary pathways of food, meat, milk, and eggs introduces uncertainty to the risk assessment. In fact, leaving out these pathways underestimates risks by an order of magnitude or more for the residential setting. Therefore, DTSC recommends that these pathways be assessed for the residential scenario when bioaccumulative chemicals are present. The Navy might want to screen these pathways using CalTOX, a multimedia spreadsheet program, which includes fate and transport together with exposure in the residential setting. CalTOX runs in Microsoft Excel; it contains a library of about 80 chemicals with physical constants, and supporting documentation can be downloaded from the HERD home page: www.cwo.com/~herd1/herd.htm.**

Response: Because NWS Concord is an open naval base, current activities at the site are limited to industrial operations and maintenance (O&M) by base personnel. Residential exposure to contaminants in animals raised at NWS Concord or homegrown produce is very unlikely under these land-use conditions. For these reasons, potential health effects associated with ingestion of food, meat, milk, and eggs are not assessed in the HHRA. A justification for elimination of these pathways from the HHRA will be provided in the draft final RI report.

8. Comment: **Page 7-21, line 5: "...congeners more than four chlorines.."**

Response: The typographical error on page 7-21 will be corrected.

9. Comment: **Risk Characterization, Sec. 7.4.2, pp. 7-27 ff.: The Navy has quantitated risks and hazards to humans adequately for the Tidal Area sites, except as noted above. Reference is made on page 7-28 and elsewhere to separation of hazard quotients by target organs of toxicity, but we found no such presentations. Please clarify, perhaps by adding tables.**

Response: The approach used to segregate hazard indices (HI) at NWS Concord will be presented in the draft final HHRA, including the assumptions and critical effects applied. If any one segregated HI exceeds 1, the discussion will state that there may be a potential for adverse noncarcinogenic health effects to occur.

SPECIFIC COMMENTS – ECOLOGICAL RISK ASSESSMENT

10. Comment: **Page 3-10, Line 3: "...palustrine."**

Response: Comment noted.

11. Comment: **Selection of COPEC, Chapter 5, pp. 5-1 ff.: We had several difficulties with the Navy's procedures for selecting COPEC.**

a. **DTSC regards screening methods as useful for deciding if sites are of interest. We do not accept screening methods for selecting COPEC. If a site is of interest, then all metals above ambient levels and all organic chemicals are COPEC. In particular, we reject the Navy's use of the criterion of 10% minimum frequency of detection to qualify as a COPEC.**

b. **Several chlorinated insecticides were selected as COPEC but only DDT and congeners were assessed. We fail to understand the purpose of identifying COPEC if risks due to their presence are not evaluated.**

c. **Some detected chemicals were eliminated from consideration after comparison to the sediment quality criteria, Effects Range-Low (ER-L) and Effects Range-Median (ER-M). These criteria are based on findings of toxicity in benthic invertebrates, but they were used to eliminate chemicals in sediment to which plants and vertebrates are exposed (e.g., see p. 11-3). We do not allow screening for COPEC, nor do we allow the misapplication of criteria across species and phyla.**

d. **Some detected chemicals were eliminated from consideration for lack of toxicity criteria. This is never acceptable. When published criteria are lacking, please convene the project team, including regulatory agencies, to arrive at an acceptable set of criteria through the use of surrogate chemicals or grouping chemicals by class.**

e. **Iron is an essential nutrient, but high levels can be quite toxic, especially in aquatic environments. Iron may not be summarily dismissed as never qualifying as a COPEC.**

f. **The Navy states that nickel was eliminated as a COPEC for surface water because it had been eliminated previously for sediment. COPEC are selected for each environmental medium independently. Thus, the Navy's logic cannot be applied to nickel.**

Response:

a. The Navy believes the 10 percent rule is appropriate for screening samples against toxicity-based values, but agrees that the screening should be conducted on each site independently. At a meeting with EPA in June 1996, EPA representatives also agreed that the 10 percent exceedance was appropriate. For screening against ambient concentrations, all exceedances will be noted regardless of the frequency. Maps showing the degree of exceedance of each contaminant of ecological concern (COEC) will be produced.

b. Other chlorinated pesticides will be evaluated in the draft final RI report. A map showing the distribution of detection for chlorinated pesticides will also be included.

c. The use of RWQCB wetland creation cover (WCC) and non-cover values is considered justified as a screening tool for wetland habitats. Effects range-low (ER-L) and effects range-median (ER-M) were only used for chemicals lacking a WCC value. In fact, WCC values, which are based on ER-Ls, allow disposal of sediment with specified levels of chemicals for purposes of wetland creation. The Navy assumes that concentrations of chemicals allowable in this situation are considered protective of all wetland receptors. Food-chain analysis is only performed for those chemicals that are considered elevated above ambient concentrations or screening values such as WCC. Food-chain modeling incorporates incidental ingestion of chemicals in sediment into the estimate of dose to higher trophic level vertebrates, providing a separate line of evidence for the ERA.

d. Comment acknowledged. The Navy would be happy to review any relevant references you feel would contribute to the meaningful evaluation of chemicals lacking screening criteria.

e. No known source of iron exists at the Tidal Area sites. It is not considered a COEC at this site.

f. Nickel was eliminated as a COEC because fewer than 10 percent of the samples exceeded the ambient concentration for soils. Nickel will be reevaluated, along with all other inorganic chemicals, using the revised ambient values. As mentioned in response to specific comment 11a above, COECs will be evaluated site by site rather than for the whole Tidal Area.

12. **Comment:** **Page 6-33, Line 5: Shouldn't the reference to Appendix B be Appendix M?**

Response: All references to appendices will be checked for accuracy.

13. **Comment:** **Definition of Hazard Quotient, Sec. 8.2, p. 8-3: Hazard quotients and their sums, hazard indices, are the figures of merit in Phase I predictive risk assessment. Denominators of hazard quotients should not be screening values but toxicity criteria, such toxicity reference values (TRV). This misuse of the hazard quotient by the Navy creates the false impression that this screening assessment is a quantitative risk assessment.**

Response: Screening values used in this QEA are based on toxicological endpoints such as ER-Ls and ambient water quality criteria (AWQC). Toxicity reference values (TRV) are available only for birds and mammals. The Navy believes this use of hazard quotients (HQ) is consistent with guidance produced by both EPA (1997) and DTSC (1996a, 1996b), as well as with current practice in the San Francisco Bay area.

14. **Comment:** **Interpretation of Hazard Quotients, Sec. 8.2.1, pp. 8-4 ff.: Although DTSC does not offer a method for screening of sites in the context of ecological risk assessment, the Navy's method of calculating a summed hazard index for every sample seems to have merit for this purpose. The method avoids the extreme conservatism of using maximum values detected for every chemical, substituting instead the "worst sample scenario". We depart from the Navy on how to interpret such a screen. If such a screen is to be used, then sites with a hazard index > 1.0 for any sample must be deemed to have failed the screen. These sites must then pass either to the next more complex level of assessment or to some type of remedial action.**

Response: As described in the attached FSA, the Navy plans to collect additional field data to fill data gaps identified during the comment period on the draft RI report. The magnitude and spatial arrangement of HIs will provide lines of evidence in the final weight-of-evidence evaluation of risk at the four Tidal Area sites.

15. **Comment:** **Leachates and WET Tests, Sec. 8.2.2, pp. 8-6 ff.: Laboratory tests of leachability cannot be used as substitutes for field measurements of bioavailability, such as residues of contaminants in food or prey items. Using very highly uncertain surrogates for bioavailability is not acceptable, especially when the directly applicable measurement can be made so readily. The WET tests add nothing to the assessment, in our opinion.**

Response: Weakly bound contaminants are expected to enter the soluble phase during the deionized water extraction. In general, the metals most easily extracted (such as in an aqueous extraction) tend to be the most bioavailable (Newman and Jagoe 1994). The Waste Extraction Test (WET)-deionized (DI) extraction simulates exposure of an organism to metals in the aqueous environment, sediment, or in saturated soils.

In contrast, the dilute HC1 extraction (WET-acid) leaches out the more tightly bound inorganic contaminants and may more closely represent the fraction expected to enter the solute phase over longer periods of time or in acidic environments. Dilute strong acids, such as those employed in the WET-acid extraction, have minimal selectivity for the various absorbents since they may remove metals from sediments both by competitive exchange and by partial dissolution of absorbents. Dilute HC1 allows a partial fractionation of metals in sediments, releasing both inorganic- and organic-associated metals, while leaving the silicate matrix relatively intact (Luoma and Bryan 1981). Dilute HC1 extractions remove the exchangeable metals sorbed on carbonate, organic, and sulfide phases, as well as oxides and hydroxides of manganese and iron (Agemian and Chau 1976). Tessier and Others (1984) have shown correlations between acid extractions of easily extracted metals and tissue levels in mollusks, indicating that the bioavailability of metals is inversely related to metal binding strength.

The screening process will be better clarified in the draft final RI report. The Navy maintains that although comparison of extraction data to AWQC is conceptually attractive because the AWQC are promulgated numerical values, strict interpretation of exceedances are problematical. In lieu of modeling bioavailability of chemicals based on extraction data, the Navy plans to collect tissues of plants, invertebrates, fish, and rodents to measure directly the bioaccumulation of chemicals by receptors at the sites.

16. **Comment:** **Page 8-9, § 3, 2nd-to-last line: "...25 inorganic Hls for the <u>Third</u> Quarter.."**

Response: The text will be corrected.

17. **Comment:** **Microtox and Cytochrome P-450, Sec. 8.3, pp. 8-10 ff.: These two tests are useful <u>in conjunction with but not in place of</u> bioassays with invertebrates and fish. To evaluate ecological risks in a tidal marsh without any bioassay data is clearly a mistake.**

Response: As explained in the final QEA work plan, dated March 1995 the Microtox and P450 bioassays were used as general indicators of contamination, not as sample-specific screening tools. The discussion in Section 8.3.1 of the draft RI report indicates that neither Microtox nor P450 results provided the kind of discriminators of risk that one would like to see in toxicity tests. Follow-on field work will include whole animal bioassays (in Otter Sluice) and analysis of tissue concentrations elsewhere to provide a better estimate of risk to receptors at the Tidal Area.

18. **Comment:** **Sec. 9.1.2, Page 9-3: Something is missing from the last sentence; please fix it.**

Response: Comment noted.

19. **Comment:** **Risk Characterization for Plants, Sec. 9.4, p. 9-5: Several areas of stressed vegetation were described in Section 3.4.3 (pp. 3-39 - 3-43). The cursory analysis in Section 9.4 sheds no light whatever on these observations. If the Navy failed to find any causal relationships in their screening process, we believe this constitutes excellent reason to gather additional information on the Tidal Area to determine the health of its plant community. Pickleweed, in particular, should be a primary focus of such an effort, due to its central importance in a saltwater marsh community.**

The screening value for chromium shown in Table 9-3 is 1 mg/kg soil, but ambient values of total chromium range up to 50 mg/kg and higher, not only at this site but all across the United States. Could this value be for hexavalent chromium instead of either trivalent or total chromium?

Response: The Navy proposes to collect and analyze pickleweed tissue as part of the follow-on field work to support food-chain modeling to the salt marsh harvest mouse. Based on existing soil data, locations in the R Area and Wood Hogger sites with the highest metals concentrations (within good pickleweed habitat) will be selected for tissue collection. The condition of vegetation in these areas will be described and presented in the draft final RI report, along with the chemical residue data. The screening value used for chromium will be verified and the table revised accordingly

20. **Comment:** **Invertebrates and Soil Biota, Chap. 10, pp. 10-1 ff.: Otter Sluice was repeatedly established as a principal transport pathway for contaminants from <u>all</u> four sites, yet no bioassays of sediment were performed. The Navy neither developed nor presented any direct information on possible toxicity of contaminants to the benthic or litter communities anywhere at the Tidal Area sites. Risks to these communities cannot be assessed without bioassays of sediment and collection of food and prey items for analysis of tissue for residues of xenobiotics.**

Response: The Navy plans to collect 10 collocated sediment and surface water samples from Otter Sluice, and to conduct sediment water interface bioassays using native larval fish. In addition, tissues of invertebrates (preferably clams) and fish from Otter Sluice will be analyzed for chemical residues. Please see the attached FSA for details on the Navy's proposed field activities.

21. Comment: **Risks to Piscivorous Species, Chap. 11: The Navy did not select any piscivorous species as indicators for assessment. Logical choices should have included birds such as egret or heron, which have mixed diets of fish and invertebrates. The endangered California clapper rail is equally striking in its absence from the document. Without consideration of such critical species, the Tidal Area sites can hardly be considered to have been screened, much less assessed.**

Response: Risk to the great blue heron, a piscivorous bird, and the black rail, which eats benthic invertebrates, will be addressed in the follow-on ecological work described in the attached FSA. A basewide wildlife survey conducted in 1993 to 1994 yielded three pairs of clapper rails, two of which were observed near Pier 3 some distance from the Tidal Area sites (Morrison and Others 1994). The third pair of clapper rails was reportedly seen near Froid Road, although the exact location is unknown at this time. Although the California clapper rail may occur at the Tidal Area, habitat at the Tidal Area sites is considered suboptimal for this species. It is the Navy's understanding that U.S. Fish and Wildlife Service (FWS) requires formal clapper rail surveys to be conducted between February 1 and April 1. The proposed field effort will not occur until mid-April, due to schedule and budget constraints. However, incidental evidence of clapper rail presence may be obtained during black rail call-back surveys. In addition, the vegetation characterization performed as part of the rail survey will provide information on the likelihood of clapper rails using the site.

22. Comment: **Food Chain Model, Sec. 11.1.1, p. 11-3: The Navy should make the equation truly generic. The numerator of the generic equation on this page is presented as the sum of two terms, one for intake of media and one for intake of food, with the latter term modified by factors for site utilization and trophic transfer. Because the species assessed have varied diets, both these terms should be expressed to reflect intake of several media or several types of food. For example, if the mallard duck is assumed to ingest both sediment and surface water and assumed further to consume a diet of 90% plant material and 10% invertebrates, then the numerator should be presented as four terms, two for ingestion of media and two for ingestion of food items, each of the latter with their respective factors. For species with more complex diets or behavior, more terms are needed.**

Response: The Navy feels it is reasonable to assume that the dominant source of contaminants to the vertebrate receptors considered in this ERA is sediment and food items. Surface water can also contain contaminants; however, estimates of an animal's incidental intake of brackish water while feeding or preening are unavailable or unreliable. In a brackish tidal marsh, it is expected that most animals acquire their water either through their food items or by leaving the area to drink at a fresh water source. Therefore, no separate ingestion rates for water were included in the dose equation.

Although it is theoretically possible to measure percentages of separate food items in the diet of a receptor through the intensive study of individuals over many seasons, such numbers are not directly applicable to other individuals, populations, geographical locations, or seasons. Variables such as (1) population density; (2) climatic patterns; (3) age, size and breeding condition of the individual; (4) presence of other species; and (5) other dynamic factors limit the attribution of percentages of prey type. Simplified assumptions will be made for each species evaluated, based on literature reports of dietary proportions. Dose estimates are limited by the availability of tissue concentrations of prey types. For great blue herons feeding near the southwest corner of the Wood Hogger site, the dose could include invertebrate and fish tissues from Otter Sluice as well as rodent tissues from the shoreline area. Actual percentages of each prey type are not known however, and so will be calculated in several ways (100 percent fish, 100 percent invertebrates, 100 percent rodents, or some combination of the three).

23. **Comment:** **Sum of Hazard Quotients, Sec. 11.1.1, p. 11-4: The last sentence on this page seems to indicate that hazard quotients are not to be summed. Is this the Navy's intent? If so, we strongly disagree. Department guidance recommends comparing the sum of hazard quotients across chemicals and media (hazard index) to 1.0. If the hazard quotient is <1.0, then the species may be said not to be at risk. If the hazard index is >1.0, then sums of hazard quotients separated by toxic endpoint should be compared to 1.0. If any of these sums is >1.0, then the species might be at risk from one or more COPEC.**

Response: The statement on page 11-4 reads, "Due to differences in the degree of conservatism in selection of TRVs for different COECs and receptors, the resulting HQ values should not be compared among COECs or receptors but should be considered individually."

For example, an HQ = 0.75 for copper exposure to ducks may or may nor represent an equivalent risk level as an HQ = 0.75 for copper exposure to rodents. Variables such as (1) the quality of the study, (2) the range of effects reported in the entire data set, and (3) the particular endpoint represented by the TRV for each receptor, and other factors result in the different degrees of conservatism and different sources of uncertainty for each TRV. The most

robust evaluation of HQs calculated from TRVs is in the direct comparison of a chemical at two sites using the same receptor. Certainly other types of comparison are possible, including calculation of HIs. The text intended only to point out the inherent uncertainties associated with such use.

Also, please see the response to EPA Volume II specific comment 31 on the technical uncertainty inherent in summing HQs.

24. **Comment:** **Chlorinated Insecticides, Sec. 11.1.2, p. 11-7: The last paragraph on this page lists the bioaccumulative COPECs to be subjected to food chain modeling. This list is not the same as the list of COPEC shown in Section 6.2.3 (pp. 6-52 - 6-53). In particular, the former list does not contain chlordane, dieldrin, aldrin, hexachlorobenzene (lindane), and mirex, all of which are highly bioaccumulative. No food web analysis or food chain modeling can be complete without evaluating all the bioaccumulative COPEC.**

Response: The draft final RI report will include an evaluation of bioaccumulative chemicals, as defined by the octanol-water coefficient (log K_{ow}). Evaluation of the risk posed by such chemicals was based on the availability of TRVs for each chemical. The draft final RI report will include discussion of toxicological effects reported in the peer-reviewed literature for chemicals lacking TRVs.

25. **Comment:** **Food Web, Sec. 11.1.2.1, p. 11-8: This section does not consider Otter Sluice and is therefore incomplete.**

Response: WESCO (1995) provides extensive information on the biological community of Otter Sluice. The draft final RI report will include information necessary to describe a food web and conceptual site model (CSM) for Otter Sluice.

26. **Comment:** **PCB Congeners, Sec. 11.2.1.1, p. 11-15: The Navy is to be commended for presenting data on total PCBs as both the sum of individual PCB congeners and as measurements of Aroclors. However, we are not clear on how the concentrations of PCB congeners were summed. Does the first paragraph on page 11-15 mean that one-half the detection limit was used for all congeners not detected in a sample, regardless of whether an individual congener was detected in any sample? Please give an example of the manner in which these data were summed.**

Also, the Navy should be aware that total PCBs can be estimated from certain combinations of congeners using regression equations. Such work has been published by California Department of Fish & Game and the National Atmospheric and Oceanic Administration. DTSC does not require that such regression equations be used, but we recommend that the Navy explore their utility.

Response: The Navy will evaluate the utility of the regression model for estimation of total polychlorinated biphenyls (PCB). The draft final RI report will include text and examples of how total PCBs were calculated.

27. **Comment:** **Chlorinated Dioxins and Furans, Sec. 11.2.1.1, p. 11-16: Toxicity equivalency factors (TEF) were developed for estimating toxicity of chlorinated dioxins and furans relative to 2,3,7,8-tetrachlorobenzo-*p*-dioxin (TCDD), the most toxic in the series. The Navy states that this series of chemicals was not evaluated for the Tidal Area sites, because the most toxic cogeners were not detected. The TEFs were developed for evaluating exactly the conditions the Navy describes. The Navy should evaluate this class of compounds using TEFs. It will also be necessary to include these compounds in food chain modeling as 2,3,7,8-TCDD equivalents.**

Response: The Navy intends to evaluate dioxins as the comment suggests in the draft final RI report. In addition, the Navy is collecting tissue samples of fish for dioxin analysis to assess risk to the great blue heron. Rodent tissues from the Wood Hogger site will also be analyzed for dioxins for use in assessing risk to their avian and mammalian predators.

28. **Comment:** **Biomagnification Factors, Sec. 11.2.1.2, p. 11-17, and Table 11-2: The scientific literature on fate and transport of any given class of chemicals contains ranges of values for trophic transfer coefficients, biomagnification factors, bioconcentration factors, etc., depending on the source medium or species, consuming species, geographic location, type of study, wet or dry weight basis, etc. Yet the Navy presents biomagnification factors as a single value. Because this purports to be a screening level assessment, the proper procedure would have been to present the full range of available data along with a justification for the particular value chosen for each application.**

The "default value" of 0.1 for biomagnification of PCBs is not believable. Please examine the presentation on PCBs in Appendix B to the Final Work Plan for the removal action at Site 4 of Naval Air Weapons Station Point Mugu, dated 6 September 1996. This document contains a range of values for trophic transfer of PCBs.

Response: The Navy used the best approach available in the absence of site-specific tissue data. The Navy has agreed to collect tissues, as described in Section 2.3 of the attached FSA, to derive site-specific bioaccumulation factors. The Navy will present a modified discussion of biomagnification factors in the draft final RI report, based on the evaluation of tissue concentration data.

29. Comment: **Equivalence of Dose and Body Burden, Sec. 11.2.1.4, p. 11-19: We know of no biological basis whatever which might justify the Navy's assumption that a daily dose in mg of chemical per kg of body weight will somehow eventually become numerically equal to the body burden in mg of chemical per kg of body weight in the same animal. Dose and concentration are equivalent. This erroneous assumption invalidates all estimates of exposure via food chain modeling. It is a fatal flaw in the ecological risk assessment.**

Response: Rather than estimate the body burden of prey items, such as small animals in the R Area, the Navy will use site-specific tissue concentrations in the dose equation. Three rodent samples from the R Area (preferably California voles) and three rodent samples from the Wood Hogger site will be analyzed for use in this way. Please see Section 2.3 of the attached FSA for details on the proposed sampling and analysis of tissues.

RESPONSE TO CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR TIDAL AREA SITES 1, 2, 9, AND 11 NAVAL WEAPONS STATION, CONCORD, CALIFORNIA DATED APRIL 16, 1997

This document presents the U.S. Department of the Navy's (Navy) responses to comments received on May 27, 1997, from the California Integrated Waste Management Board (CIWMB) on the draft remedial investigation (RI) report dated April 14, 1997, for Tidal Area Sites 1, 2, 9, and 11, Naval Weapons Station (NWS) Concord, California.

SPECIFIC COMMENTS - SITE 1: TIDAL AREA LANDFILL

1. **Comment:** **Based on the boring logs provided in Appendix F for the Tidal Area Landfill, it is not apparent whether landfilled material was encountered or not. Also, Exhibit 1 RI sampling locations indicates that the sample borings, which ranged from 2-7 feet deep, are at the periphery of the Tidal Area Landfill. Has the horizontal extent of the landfill been physically surveyed and verified, i.e. electromagnetic or other geophysical survey and verification trenching, for capping purposes? The landfilled area will also need to be surveyed in and documented in the base master plan to control land-users and impose restrictions, should development be considered.**

   Response: The perimeter of the Tidal Area Landfill is visually apparent and will be surveyed as part of the capping design process.

2. **Comment:** **Several of the boring logs indicated a sulfur (Hydrogen Sulfide?) or organic odor. Photoionization Detector (PID) measurements were noted in the boring logs, however PIDs generally do not provide a response to methane, a typical landfill gas constituent. Were any gas measurements taken using a combustible gas indicator (CGI) or organic vapor analyzer (OVA) from sample boring or other subsurface locations near the landfill to determine the presence of landfill gas? Was any gas sampling done, in accordance with T.O.-14 procedures, in the landfill itself to determine if methane generation is occurring? Has Air Solid Waste Assessment Testing (SWAT) been performed for the site?**

   Response: Combustible gas indicator (CGI) readings were collected at the eight soil borings drilled around the Tidal Area Landfill. No combustible gas was detected. Gas sampling and air Solid Waste Assessment Testing (SWAT) were not performed.

3. **Comment:** **It is implied that no excavation activities were conducted prior to waste disposal; was the vertical extent of the landfill physically verified to determine what the appropriate depth will be for perimeter gas monitoring probes?**

Response: As shown in cross-section F-F', the vertical extent of the landfill was determined from the results of the site investigation (SI) borings drilled into the landfill. There is no economic reason for excavation of the landfill prior to placement of the waste at this site. Consequently, it is unlikely that the underlying material was excavated. Should sampling be necessary to determine the appropriate depth of gas monitoring probes, then sampling shall be conducted.

4. **Comment:** **Are the actual boring logs available for the groundwater monitoring wells TLSMW004 and TLSMW005? They are not included in Appendix F, and Figure 5-4 provides only a fence diagram.**

Response: The boring logs for the monitoring wells TLSMW004 and TLSMW005 are included in the SI report.

SPECIFIC COMMENTS – SITE 2: R AREA DISPOSAL

1. **Comment:** **The site history indicates that the disposal area was 800 feet long by 600 feet wide and 5 feet deep. What specific area within the "R" Area contained this fill and was it encountered during sampling activities? Was the site a landfill-type waste management unit or simply debris that was deposited over "R" Area, i.e. sporadic dumping?**

Response: Disposal was conducted in the area east of Baker Road. This area was encountered during the RI. Purposive sampling locations were selected based on knowledge of disposal areas. The R Area appears to have received sporadic dumping of waste. The draft final RI report will be clarified to indicate the waste area and discuss the nature of the waste.

2. **Comment:** **The sample boring logs for the R Area Disposal Site in Appendix F does not appear to indicate the presence of landfill debris or non-native materials. Was the Geoprobe sampling equipment used during the sampling activities capable of identifying typical landfill constituents such as glass, plastic and metal containers?**

Response: Boring logs were only constructed for borings greater than one foot below ground surface. The majority of the area impacted by disposal was characterized by surface sampling. However, the boring logs (specifically RADSBB06, RADSBB08, and RADSBC05) mention the presence of waste in the form of wood or ammunitions casings.

3. **Comment:** **The site history also indicates that an estimate for the debris deposited in Area R is approximately 650 tons. Based upon our experience with clean-closure or consolidation of landfills and waste piles, it economically feasible to consolidate and clean-close this site based on quantity only. Specific measures, such as hazardous waste management and UXO identification, safing and remove may be required, however other DoD facilities (such as Fort Ord Army Base and Mather Air Force Base) performing landfill consolidation activities have successfully managed these types of hazards by using HMIRO and EOD trained personnel, and incorporating specific contingency plans and procedures for excavation, stockpiling, transportation, disposal and consolidation activities.**

Response: The R Area site is currently being recommended for no further action. However, if the waste at the R Area site needs to be removed then the option of waste consolidation will be assessed.

SPECIFIC COMMENTS - FROID AND TAYLOR ROAD SITE

1. **Comment:** **Based on the boring logs in Appendix F, it appears as if this site is primarily surficial dumping and would not be considered a "fill" area. Consideration should be given to removing the surficial debris from the site and consolidating it to the Tidal Landfill prior to capping. Contaminated soil (based on the level of contamination) could potentially be used as foundation soil for the cap.**

Response: The Froid and Taylor Road site is currently being recommended for no further action. However, if the surface waste at the site needs to be removed then the option of waste consolidation will be assessed.

2. **Comment:** **If consolidation is considered in the feasibility study, a cut and fill analysis should be performed based on final site grades to determine earthwork quantities and costs needed.**

Response: Comment noted.

SPECIFIC COMMENT - WOOD HOGGER SITE

1. **Comment:** **Based upon soil boring data provided in Appendix F, which showed that a "fill" material, i.e. wood chips, was encountered, this site may be considered a solid waste disposal site and some IWMB ARARs may apply to this site, i.e. capping, gas monitoring, etc. Wood waste sites in California are typically covered by Solid Waste Management Regulations.**

Response: Any CIWMB applicable or relevant and appropriate requirements (ARAR) that apply will be added to the draft final RI.

SPECIFIC COMMENTS - INVESTIGATIVE METHODS

1. **Comment:** **Based upon the non-mechanical methods for soil sampling provided on page 3-2, it does not appear that data regarding the horizontal or vertical extent of the landfill was obtained. In order to determine the feasibility of specific remedies, such as capping, gas monitoring, excavation and consolidation, it is important to know the vertical and horizontal extents of the waste.**

   Response: The horizontal extent of the landfill is visually apparent and the vertical extent was determined from the SI borings drilled into the landfill.

2. **Comment:** **Gas and organic vapor measuring equipment which utilize temperature dependent resistors (thermister) or "hot-wire" elements to measure concentrations of organic substances may be biased by the presence of gas with high relative humidities. This is because the "hot-wire" element may be "cooled" by the presence of moisture, thus biasing the true concentration of organic carbons present. Based upon the data in the boring logs, it appears that most of the soil was moist to wet. Although most gas detection instruments come with hydrophilic filters, they may be bypassed if the sample gas stream is highly saturated.**

   Response: Comment noted.

3. **Comment:** **Since Photoionization Detectors (PID) will generally not provide a response to methane, which along with carbon dioxide are typical landfill gas constituents, further gas characterization should be considered from the fill areas to determine the importance of gas monitoring and control issues.**

   Response: CGI readings were collected at the eight soil borings drilled around the Tidal Area Landfill. No combustible gas was detected.

SPECIFIC COMMENTS - ACTION-SPECIFIC ARARS FOR SITE 1: TIDAL AREA LANDFILL (TABLE 4-1)

1. **Comment:** **14 CCR 17766, Emergency Response Plan, are relevant and appropriate since this site may potentially have hazards, i.e. UXOs, that require notification, emergency procedures and corrective actions in the postclosure period (this requirement may be addressed by the document that will specify responsibilities and maintenance and monitoring tasks performed for the landfill during the postclosure period).**

Response: Since the RI was draft and reviewed, California Code of Regulations (CCR) Title 23 and CCR Title 14 regulations have been combined into CCR Title 27. The RI will be revised to identify the applicable substantive CCR Title 27 provisions for the presumptive remedy at the Tidal Area Landfill. The Navy will review each provision to determine if it is substantive and pertinent to the Tidal Area Landfill. The Navy will review each of the individual CCR Titles 14 and 23 provisions cited by CIWMB and will add the CCR Title 27 citation as appropriate. In some cases, the provision will be cited in the RI report as a potential action-specific ARARs but the feasibility study may determine that it is not an ARAR.

2. **Comment:** **14 CCR 17773(c), Final Cover, Engineered Alternatives, may be applicable, should the feasibility study consider alternative engineered cover systems for the presumptive remedy i.e. use of geosynthetic liners in lieu of a 1×10^{-6} cm/sec compacted soil.**

Response: See the response to specific comment 1.

3. **Comment:** **14 CCR 17773(d), Final Cover, non-compliance with prescriptive standard, will be applicable if the feasibility study considers a presumptive remedy that will not meet the prescriptive standard.**

Response: See the response to specific comment 1.

4. **Comment:** **14 CCR 17773(e), Final Cover, additional cover thickness and quality, will be applicable if there are site conditions posing a threat to public health & safety and the environment that will not be addressed by the prescriptive standard.**

Response: See the response to specific comment 1.

5. **Comment:** **14 CCR 17774(c) & (d), Construction Quality Assurance (CQA) plan and documentation, are applicable because the test plans, test results and verification data are the basis for the Closure Certification report which evidences that the landfill was closed according to applicable standards.**

Response: See the response to specific comment 1.

6. **Comment:** **14 CCR 17774(e)(2), CQA, tests on the barrier layer, are applicable if the feasibility study determines that a prescriptive cover with a barrier layer of compacted soil exhibiting a permeability of 1×10^{-6} cm/sec will be constructed for the final cover.**

Response: See the response to specific comment 1.

7. **Comment:** **14 CCR 17774(g), CQA, test-fill pad requirement, is applicable if the operator intends to mine an on-site source of soil for the barrier layer.**

Response: See the response to specific comment 1.

8. **Comment:** **14 CCR 17774(h)(1), CQA, earthen material testing, is applicable if the operator uses soil that minimally meets the requirements for foundation, barrier or vegetation layers.**

Response: See the response to specific comment 1.

9. **Comment:** **14 CCR 17777(c), Final Site Face, slope stability report, is applicable since the site is located in a seismically impacted area (reference figure 2-8, location of Clayton fault). If the feasibility study recommends a consolidation project, the landfill geometry should be analyzed to ensure that final grades and slopes are designed to the MPE under dynamic conditions.**

Response: See the response to specific comment 1.

10. **Comment:** **14 CCR 17781, Leachate Control During Post Closure, is applicable, unless waived by Regional Water Quality Control Board permits or Waste Discharge Requirements.**

Response: See the response to specific comment 1.

11. **Comment:** **14 CCR 17782, (note error in Table 4-1 referencing "177829") is applicable, waived by Regional Water Quality Control Board permits or Waste Discharge Requirements.**

Response: See the response to specific comment 1.

12. **Comment:** **14 CCR 17783, Gas Monitoring and Control Requirements, should be applicable in its entirety. Gas generation and migration at the Tidal Landfill is unknown, since the Remedial Investigation did not address these issues. Thus perimeter monitoring and gas control requirements should be adhered to unless field data indicates otherwise. The gas control trigger level of 1.25% concentration levels of methane within structures provides a standard for structures on within 1000 feet of the landfill. There are several structure (reference Exhibit 1) within 1000 feet of the Tidal Landfill Area. It also includes any structures that may be proposed in the postclosure period of the site.**

Response: See the response to specific comment 1.

13. **Comment:** **14 CCR 17788(4), Post-Closure Maintenance, ground water monitoring, is applicable, unless waived by Regional Water Quality Control Board permits or Waste Discharge Requirements.**

Response: See the response to specific comment 1.

14. **Comment:** **14 CCR 17796(b), Postclosure Land Use, is applicable to ensure that any postclosure construction improvements at Site 1 be submitted for review and comment concerning possible construction problems and hazards to health and safety. This requirement needs to be tied to any land transfer conducted involving Site 1.**

Response: See the response to specific comment 1.

15. **Comment:** **14 CCR 18262.3, Closure Plan contents are relevant and appropriate. Site maps, environmental monitoring and site security maps, final grading plans, final drainage plans should be prepared as part of preconstruction activities for site closure.**

Response: See the response to specific comment 1.

16. **Comment:** **14 CCR 18265.3, Postclosure maintenance plan contents are relevant and appropriate to ensure that the integrity of the cover and environmental monitoring and control systems are maintained during the postclosure period.**

Response: See the response to specific comment 1.

17. **Comment:** **14 CCR 18275, Closure certification report contents are relevant and appropriate to provide evidence that the site was closed in accordance with applicable regulations.**

Response: See the response to specific comment 1.

18. **Comment:** **14 CCR, Article 7.5, requirements may be relevant and appropriate if the feasibility study proposes any excavation and consolidation of landfilled material (see attachment 1 State ARARs for Solid Waste Disposal Site Closure and Postclosure Maintenance).**

Response: See the response to specific comment 1.

SPECIFIC COMMENTS – GEOLOGY OF THE TIDAL AREA SITES

1. **Comment:** **The artificial fill used to backfill the original slough in the area, as well as fill material for levees, roads and structures may be a preferential pathway for landfill gas if the fill materials were permeable, i.e. sand or gravel. Pathways that connect the landfill and any on-site structures should be monitored for landfill gas.**

   Response: The landfill contains about 10 feet of waste covered with a thin veneer of native soil. The surface of the landfill is hummocky and the soil cover is pierced in many locations by animal burrows. The waste in the landfill appears to consist predominantly of construction wastes, which are not expected to generate large quantities of methane. Whatever small quantities of methane that are produced are likely to be vented vertically through the top of the landfill rather than laterally through preferential flow pathways because the vertical pathway is shorter and more direct.

   The presence of possible preferential flow pathways was investigated by a hand auger survey on September 11, 1997. Several shallow borings were drilled with a hand auger in the filled portions of the slough southwest of the landfill. The borings were drilled with a hand auger because the area is currently inaccessible to drill rigs due to saturated soils in the area. Lithology of the soil borings showed that coarse materials were used to fill the slough in some areas, but that the slough is very shallow and the water table was below the base of the fill material in all cases. Consequently, the filled portions of the slough can not act as preferential groundwater flow pathways in the area southwest of the landfill.

2. **Comment:** **In order to achieve the proper final grades necessary to prevent ponding, and promote drainage (both run-on to the fill area and run-off from the fill area), additional soils may need to be imported, since many of the low-lying adjacent areas have ponded water during the wet season. This may need to be considered during the feasibility study for a presumptive remedy cap (cap top deck grading is usually 3%, and side slopes are 3H:1V).**

   Response: Comment noted.

SPECIFIC COMMENTS – BIOLOGICAL PROCESSES

1. **Comment:** **Has any field investigation been performed to determine if the appropriate conditions exist, i.e. microbial population, pH, soil moisture content, etc., at the Wood Hogger or the Froid-Taylor Road site to validate the assumption that biological degradation of petroleum contamination will**

occur? What period of time would be considered appropriate for "natural" attenuation? How would current levels of contamination be monitored to determine if decreases in TPH concentrations were occurring?

Response: Microbial populations were not evaluated in the RI; however, both soil pH and moisture content were measured at the Tidal Area sites. Based on these measurements and the biologically active nature of wetlands environments, it seems reasonable to expect the petroleum hydrocarbons to degrade over time. NWS Concord is an active installation and activities conducted in the Tidal Area are not scheduled to change in the foreseeable future, so the time needed for biodegradation of total petroleum hydrocarbons (TPH) is not a concern. No soil sampling is currently proposed at the site to assess changes in TPH concentrations, but future sampling could be conducted if and when the property changes ownership.

SPECIFIC COMMENTS – SUMMARY AND RECOMMENDATIONS

1. **Comment:** **OWMB concurs that Title 14 ARARs apply to the Tidal Landfill Site and that a presumptive remedy is feasible. However, additional data is required to determine if landfill gas generation and migration is occurring. Also further intrusive field investigation my be necessary to determine the horizontal vertical extent of the fill to validate the extent of the final cover. Additional earthmoving and contouring appears to be necessary to improve drainage at the site.**

   Response: Please see responses to Tidal Area Landfill site comments 1, 2, and 3 and the Tidal Area site Geology comment 1.

2. **Comment:** **IWMB, based on the amount of surficial debris located in Area R, a realistic cost estimate should be performed for clean-closing the site. Consolidation of the surficial debris into the Tidal Landfill prior to capping, could cut costs for landfill tipping fees. Several other DoD installations have performed or are proposing to perform landfill consolidation strategies as viable remedial options. If further information is needed on these projects to assess potential feasibility, please contact our agency.**

   Response: Please see response to R Area site comment 3.