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RCRA FACILITY INVESTIGATION ADDENDUM RATIONALE FOR NO FURTHER ACTION AT SOLID WASTE MANAGEMENT UNIT 164 ZONE K CNC CHARLESTON SC

6/1/2001

CH2MHILL

RFI ADDENDUM

Rationale for No Further Action

Solid Waste Management Unit (SWMU) 164, Zone K

Charleston Naval Complex
North Charleston, South Carolina

SUBMITTED TO
U.S. Navy Southern Division
Naval Facilities Engineering Command

CH2M-Jones

June 2001

Revision 0
Contract N62467-99-C-0960

CH2MHILL TRANSMITTAL

To: Mr. David Scaturo
Division of Hazardous and Infectious Wastes
South Carolina Department of Health and Environmental Control

From: Dean Williamson
(352) 335-5877, ext. 2280

Date: November 9, 2001

Re: Responses to Comments on RFI Report Addendum for SWMU 164, Zone K

Quantity	Description
4	Four (4) copies of the Responses to Comments on RFI Report Addendum for SWMU 164, Zone K

If material received is not as listed, please notify us at once.

Remarks:

Copy To:

Rob Harrell/Navy, w/att
Gary Foster/CH2M HILL, w/att

SCDHEC General Comment:

Several sections are concluded with sweeping statements which suggest there is no need for further action. These statements are not always supported. See specific comments below for the specific examples. Until these comments are resolved, the recommendation for no further action can not be supported.

CH2M-Jones Response:
The data presented in the original RFI report and RFI report addendum (RFIRA) as well as the additional discussion presented herein continue to strongly support the conclusion that no releases of contaminants have occurred at SWMU 164 that require further action.

SCDHEC Specific Comment 1:

Page 3-1, Section 3.1
The depth range for the surface soil samples and the subsurface soil samples should be stated somewhere in this section.

CH2M-Jones Response 1:
Revised pages that specify the depth of surface and subsurface soil samples will be provided. The sampling depths were as previously described in the work plan and as provided in the appendix to the RFIRA (0 to 1 ft bls for surface soil samples and 3 to 5 ft bls for subsurface soil samples).

SCDHEC Specific Comment 2:

Page 3-3, Section 3.1.1
The text cites an evaluation criteria saying that no surface sample (of aluminum) exceeded the greater of the risk based criteria (RBC) or the background reference concentration (BRC). In Section 5.1 RFI Status, the report recommends No Further Action for this site because no chemical detections at this site exceeded risk-based criteria and background reference concentrations. For programmatic consistency, one set of evaluation criteria should be employed. Revise text and evaluations as appropriate.

CH2M-Jones Response 2:
Please note that the phrase "no surface soil sample exceeded the greater of the RBC or the background reference concentration" and the phrase "no surface soil sample exceeded the RBC and the background reference concentration" are logically identical. The reason for this is that in the first phrase, if a parameter exceeds the greater of the two criteria, it must also exceed the lesser criteria, therefore it has exceeded both criteria (the background reference concentration and the RBC). There is no inconsistency in these two phrases; a single set of evaluation criteria has been employed. No text revision is necessary.

SCDHEC Specific Comment 3:

Page 3-3, Section 3.1.3
This discussion of subsurface soil thallium concentrations does not include any comparison to background concentrations. The later discussion regarding thallium on Page 4-3 goes through a lengthy discussion stating that no Zone K background value is available due to the fact that all samples reported thallium below detection limits. For added clarity, this statement should be included in this earlier discussion.

CH2M-Jones Response 3:
The statement "no Zone K background value for thallium is available due to the fact that all samples reported thallium below the detection limit" will be added to section 3.1.3.

SCDHEC Specific Comment 4:

Page 3-3, Section 3.3
This section discusses background soil sampling. The collection of only six surface soil samples seems a low number for a data set for background value calculation. The collection of three samples for subsurface soils is too few samples for a data set for background value calculation. These values would be more appropriately called reference values and their use under the same rule as background values (i.e. ok if less than 2x background) should be a matter for discussion for the BRAC Cleanup Team.

CH2M-Jones Response 4:
The phrase "background concentrations" and the term "background," as used on page 3-3, Section 3.3, refer to the results of the background samples or to the samples themselves. We agree that the phrase "reference concentration" can be applied to a value of two times the mean, however, it should be noted that nowhere in Section 3.3 on page 3-3 is the phrase "background concentration" or "background value" used to refer to two times the mean. The BCT has discussed the use of these data; the manner in which these results are discussed in Section 3.3 are consistent with BCT discussions. No text revision is considered necessary.

SCDHEC Specific Comment 5:

Page 4-2, Section 4.2.2
This section discusses the subsurface occurrence of arsenic. The single detected concentration is from sample K164SB002. The argument put forth in the text regarding a set of background samples (surface soil and subsurface soil) in which the arsenic value decreases by two orders of magnitude with depth and therefore indicates that the leaching is not occurring is not valid. The arsenic value from samples 164SB002T1 and T2 clearly shows that sample T2 clearly exceeds the background (reference) value, both values are above the screening criteria and, taken together, indicate a trend that increases with depth. The data presented point more towards a lack of delineation of arsenic concentrations in soil rather than support of the statement that Arsenic in subsurface soil does not warrant further investigation or action at SWMU 164.

While the inclusion of information (no arsenic detections in five sampling events) from the closest downgradient well is good evidence for the non-leachability of arsenic, the inclusion of sidegradient direct push technology (DPT) wells is of considerably less value. In the following section, 4.3 Groundwater, two DPT wells are discussed: 166GP018 and 166GP072. The text states that metals were not detected in a filtered groundwater sample from 166GP018. The use of filtered samples is not generally allowed by Region 4 EPA. There are no metals analytical results stated for location 166GP072. These items in Section 4.3 do not support the blanket conclusion in Section 4.2.2 that the groundwater in the area is not affected by arsenic. The information presented is insufficient to draw that conclusion.

CH2M-Jones Response 5:
In evaluating whether COPCs may be present at a site, it is important to differentiate between potential contaminants that may have originated at a SWMU/AOC and potential contaminants that may be part of the background conditions. In the case of arsenic as a potential surface or subsurface soil contaminant at SWMU 164, the weight of evidence clearly supports the conclusion that arsenic is not a soil COPC or COC at SWMU 164 (i.e., there are no data suggesting that the presence of arsenic detected in the soil samples from the drainage swales next to the site is related to release of contamination at SWMU 164). This weight of evidence includes the following:

- *None of the surface or subsurface soil samples adjacent to the building in which SWMU 164 was located had elevated arsenic.*
- *No source area of arsenic contamination at SWMU 164 has been found or reported to be present.*
- *No releases of arsenic or its use as a process component at SWMU 164 have been reported.*
- *The sole occurrence of arsenic in subsurface soil above screening criteria occurred away from SWMU 164 in the drainage ditch with no elevated arsenic occurrences in adjacent samples, which is indicative of a lack of site-specific releases.*

Given that there is no plausible linkage between the arsenic in the drainage ditch and SWMU 164, the question of whether it is related to site background conditions should be considered. Again, the weight of evidence suggests that the arsenic in the drainage ditch is very plausibly related to background conditions at the Annex.

The additional soil background sampling conducted as described in the technical memorandum entitled "Results of Additional Background Sampling of the CNC Railroad and Annex (Zone K)," dated August 10, 2001, found that arsenic concentrations in background soil were significantly greater than originally identified in the RFI work completed by the Navy/EnSafe team. For example, two surface soil samples, one adjacent to the edge of an outdoor (asphalt) basketball court and one adjacent to a fence gate, had arsenic concentrations of 92 and 55 milligrams per kilogram (mg/kg), respectively.

The most likely source of the arsenic in these background samples, as well as at boring K164SB002, is from the use of arsenic-containing herbicides at the Annex during its past 50-year operational history. Both of the background locations referred to above are locations at which the use of herbicides is likely.

Because the data do not indicate that the arsenic detected in drainage ditch soil sample K164SB002 originated at SWMU 164, and because the additional background sampling identified elevated arsenic at concentrations greater than those detected in the drainage ditch samples near SWMU 164, further evaluation of this issue under RCRA does not appear warranted.

The issue of whether there are sufficient data to assess whether arsenic in groundwater is an issue at the Annex is discussed in the Response to SCDHEC Comment 6.

SCDHEC Specific Comment 6:

Page 4-3, Section 4.3

The value for arsenic in the subsurface soil sample for sample number 164SB002T2 is reported at 38.5 mg/kg while the soil-to-groundwater soil screening level is reported to be 14.5 mg/kg. So, the reported arsenic concentration is more than twice the concentration suggested as a screening value which would provide protection from compounds leaching into the groundwater. The statement on lines 10 and 11 on page 4-4 which states that >no chemical were found in soil at concentrations that would indicate a potential soil-to-groundwater pathway is clearly not supported by the arsenic values reported and should be removed.

CH2M-Jones Response 6:

As discussed in the Response to SCDHEC Comment 5, there are no data that suggest that arsenic contamination has occurred in soil due to the activities at SWMU 164, nor do the data suggest that the arsenic detected at soil boring 164SB002 originated from activities at SWMU 164.

In considering whether arsenic in soil is a potential threat to groundwater, not only at this location in the drainage ditch adjacent to SWMU 164 but at the site overall, a variety of factors that are relevant to arsenic's behavior in the environment must be considered. In this regard, the generic SSL value, although it provides a quick screen for leachability concerns, is not a highly relevant factor for several reasons, including the following:

1) *Arsenic in the background samples significantly exceeded the generic SSL for arsenic.*

2) *Arsenic concentrations in groundwater depend much more on site-specific geochemical processes and conditions than on the arsenic concentration in the soil.*

3) *Arsenic has been detected in only a single groundwater sample (at a concentration less than 2 micrograms per liter [µg/L]) in all of the groundwater sampling conducted at the Annex. Arsenic has been below detectable levels in all other groundwater samples analyzed at the Annex.*

An overall discussion of the geochemical behavior of arsenic in soil/groundwater systems, as it relates to observed arsenic concentrations and geochemical conditions at the CNC main base, was presented to the BCT in a technical memorandum entitled "An Overview of Arsenic Geochemistry, Terminal Electron Accepting Processes in GW Systems, and Implications for the CNC Hydrogeologic Environment," dated August 17, 2001.

In this memorandum, it was noted that research had demonstrated that arsenic exhibits unique geochemical behavior, compared to other metals, and that its valence and behavior (as an oxyanion) are highly sensitive to the soil/groundwater system's oxidation-reduction potential (ORP). Soluble arsenic concentrations are typically controlled by redox conditions, biological activity, adsorption reactions, and pH, but not by solubility equilibria. In reducing conditions arsenic may be released into groundwater due to natural geochemical processes, whereas under oxidizing conditions, arsenic concentrations in groundwater may remain very low.

Geochemical conditions at the Annex are somewhat different than at the CNC main base. Dissolved oxygen (DO) levels of 2 to 3 milligrams per liter (mg/L) have been measured in background wells at the Annex, while DO levels at the main base are typically below 1 mg/L. ORP levels also appear to be generally greater at the Annex as compared to the CNC main base. The higher DO and higher redox appears effective in creating conditions in which arsenic does not occur at elevated concentrations in groundwater at the Annex. Whereas conditions at the CNC main base appear conducive to the natural presence of arsenic at elevated concentrations, the conditions at the Annex appear to favor the general absence of arsenic in groundwater.

These DO and ORP measurements are consistent with the groundwater data collected at the Annex, which demonstrates that arsenic in groundwater is not a concern at the Annex. Of the 58 groundwater samples that were analyzed for arsenic from 24 wells at the Annex since RFI activities began in 1997, arsenic was below the detection limit in 57 of these samples, with detection limits of less than 4 µg/L. (See Table 1 attached). The single detection of arsenic was at a concentration of 1.8 µg/L (J). These data conclusively demonstrate that arsenic in groundwater is not a concern at the Annex.

Given that the Annex has been used for various military and industrial activities since World War II (over 60 years), during which time arsenical pesticides are likely to have been applied many times, there has been ample time for leaching of arsenic into groundwater to occur if conditions conducive to such leaching were present. The fact that there is almost no detectable arsenic present in groundwater at the site demonstrates that significant leaching of arsenic into groundwater is not occurring.

In summary, CH2M-Jones does not believe any further effort to assess arsenic in soil or groundwater is warranted at SWMU 164 for the following reasons:

1. *No data indicate that arsenic soil contamination has occurred from activities at SWMU 164, nor do they indicate that the arsenic detected in the drainage ditch soil at boring 164SB002 originated from activities at SWMU 164 (the arsenic is not site-related).*
2. *The arsenic detected in the drainage ditch samples is most likely related to site background, since the concentrations are within the range detected at background locations across the Annex.*
3. *All groundwater data overwhelmingly support the conclusion that arsenic in groundwater is not an issue of concern at this site, nor anywhere else at the CNC.*

TABLE 1
Arsenic Results for Groundwater Monitoring Wells in the Charleston Naval Complex Annex
Response to Comments, RFI Report Addendum, SWMU 164, Zone K (Revision 0)

Station	Sample	Date	Result (µg/L)	Qualifier	MCL (µg/L)
K166GW001	166GW00101	01/03/1997	1.7	U	50
	166GW00102	04/18/1997	3.0	U	
	166GW00103	07/23/1997	2.8	UJ	
	166GW00104	10/22/1997	1.8	UJ	
	161GW00101	01/03/1997	1.7	U	
	161GW00102	04/18/1997	3.0	U	
	161GW00103	07/25/1997	2.8	U	
	161GW00104	10/22/1997	1.8	UJ	
	162GW00102	04/17/1997	3.0	U	
	162GW00101	01/06/1997	1.7	U	
	162GW00103	07/24/1997	2.8	U	
	162GW00104	10/20/1997	1.8	UJ	
	162GW00105	12/07/1999	3.3	U	
K162GW002	162GW00201	01/02/1997	1.7	U	50
	162GW00202	04/17/1997	3.0	U	
	162GW00203	07/24/1997	2.8	U	
	162GW00204	10/20/1997	1.8	UJ	
	162GW00205	12/07/1999	3.3	U	
K163GW001	163GW00101	01/03/1997	1.8	J	50
	163GW00102	04/17/1997	3.0	U	
	163GW00103	07/28/1997	2.8	UJ	
	163GW00104	10/23/1997	1.8	UJ	
	696GW00101	12/06/1999	3.3	U	
K696GW002	696GW00201	12/06/1999	3.3	U	50
K696GW003	696GW00301	12/06/1999	3.3	U	50
K698GW001	698GW00101	01/06/1997	2.0	U	50
	698GW00102	04/18/1997	3.0	U	
	698GW00103	07/25/1997	2.8	U	
	698GW00104	10/23/1997	1 8	UJ	
	698GW00105	12/07/1999	3.3	U	
K698GW002	698GW00201	12/07/1999	3.3	U	50
KGDKGW001	GDKGW00104	10/21/1997	1.8	UJ	50
	GDKGW00101	01/02/1997	1.7	U	
	GDKGW00102	04/16/1997	3.0	U	
	GDKGW00103a	07/29/1997	2.8	UJ	
KGDKGW002	GDKGW00201	01/06/1997	1.7	U	50
	GDKGW00202	04/16/1997	3.0	U	
	GDKGW00203b	07/29/1997	2.8	UJ	

TABLE 1
Arsenic Results for Groundwater Monitoring Wells in the Charleston Naval Complex Annex
Response to Comments, RFI Report Addendum, SWMU 164, Zone K (Revision 0)

Station	Sample	Date	Result (µg/L)	Qualifier	MCL (µg/L)
KGDKGW002	GDKGW00204	10/21/1997	1.8	UJ	50
	GDKGW00205	12/07/1999	3.3	U	
K166GWTM1	166GWTM1T1	10/07/1999	3.3	U	50
	166GWTM1T2	12/15/1999	3.3	U	
K166GWTM2	166GWTM2T1	10/07/1999	3.3	U	50
	166GWTM2T2	12/15/1999	3.3	U	
K166GWTM3	166GWTM3T1	10/07/1999	3.3	U	50
K166GWPWB	166GWPWBT2	12/16/1999	3.3	U	
K166GWTM4	166GWTM4T1	10/07/1999	3.3	U	50
	166GWTM4T2	12/15/1999	3.3	U	
K166GWTM3	166GWTM3T2	12/15/1999	3.3	U	50
K166GWIN1	166GWIN1T1	10/08/1999	3.3	U	50
K166GWIN2	166GWIN2T1	10/08/1999	3.3	U	50
K166GWIN4	166GWIN4T1	10/08/1999	3.3	U	50
K166GWPWA	166GWPWAT1	10/07/1999	3.3	U	50
	166GWPWAT2	12/16/1999	3.3	U	
K166GWPWB	166GWPWBT1	10/06/1999	3.3	U	50
K166GWIN3	166GWIN3T1	10/08/1999	3.3	U	50
K166GW16D	166GW16DT1	10/08/1999	3.3	U	50
K166GW10D	166GW10DT1	10/07/1999	3.3	U	50

All units are presented in micrograms per liter (µg/L).

J The reported value is the estimated detection limit.

U The analyte was undetected.

UJ The analyte was undetected and the reported value is an estimated detection limit.

RFI ADDENDUM

Rationale for No Further Action
Solid Waste Management Unit (SWMU) 164, Zone K

Charleston Naval Complex
North Charleston, South Carolina

SUBMITTED TO
U.S. Navy Southern Division
Naval Facilities Engineering Command

PREPARED BY
CH2M-Jones

June 2001

Revision 0
Contract N62467-99-C-0960
158814.ZK.PR.06

Certification Page for RFI Addendum (Revision 0) – SWMU 164, Zone K, CNC Annex

I, Dean Williamson, certify that this report has been prepared under my direct supervision. The data and information are, to the best of my knowledge, accurate and correct, and the report has been prepared in accordance with current standards of practice for engineering.

South Carolina

Temporary Permit No. T2000342

Dean Williamson, P.E.

6/5/2001

Date

SOUTH CAROLINA
CH2M HILL, INC.
No. C00201
CERTIFICATE OF AUTHORIZATION

Contents

Section **Page**

Acronyms and Abbreviations ..... **vi**

1.0 Introduction **1-1**
1.1 Background 1-1
1.2 Purpose of the RFI Addendum 1-2
1.3 Report Organization 1-3
Figure 1-1 Location of Zone K, CNC Annex within the CNC 1-4
Figure 1-2 Aerial Photograph of SWMU 164 1-5

2.0 Summary of RFI Conclusions for SWMU 164 ..... **2-1**
2.1 Surface Soil 2-1
2.2 Subsurface Soil 2-2
2.3 Groundwater 2-2
Figure 2-1 Original RFI Soil Boring Locations and Site Features 2-3

3.0 Summary of Additional Information **3-1**
3.1 Soil Sampling and Analysis 3-1
3.1.1 Aluminum 3-2
3.1.2 Arsenic 3-2
3.1.3 Thallium 3-3
3.1.4 BEQs 3-3
3.2 Groundwater 3-3
3.3 Background Soil Sampling 3-3
Table 3-1 Summary of Additional Sampling and Analyses 3-3
Table 3-2 Additional Surface Soil Inorganic Analytical Results—Detections Only 3-5
Table 3-3 Additional Subsurface Soil Inorganic Analytical Results—Detections Only 3-14
Table 3-4 Additional Surface Soil Organic Analytical Results—Detections Only 3-23
Table 3-5 Additional Subsurface Soil Organic Analytical Results—Detections Only 3-25
Figure 3-1 Additional Surface and Subsurface Soil Sample Locations 3-26
Figure 3-2 Arsenic Concentrations within SWMU 164 3-27
Figure 3-3 BEQ Concentrations in Surface Soil 3-28

4.0 COPC/COC Refinement 4-1
4.1 Surface Soil 4-1
4.1.1 Arsenic 4-1
4.1.2 BEQs 4-1
4.2 Subsurface Soil 4-2
4.2.1 Aluminum 4-2
4.2.1 Arsenic 4-2
4.2.3 Thallium 4-2
4.3 Groundwater 4-3
Table 4-1 Surface Soil Analytical Results for Parameters Exceeding Screening Criteria 4-5
Table 4-2 Subsurface Soil Analytical Results for Parameters Exceeding Screening Criteria 4-6

5.0 Summary of Information Related to Site Closeout Issues 5-1
5.1 RFI Status 5-1
5.2 Presence of Inorganics in Groundwater 5-1
5.3 Potential Linkage to SWMU 37, Investigated Sanitary Sewers at the CNC 5-2
5.4 Potential Linkage to AOC 699, Investigated Storm Sewers at the CNC 5-2
5.5 Potential Linkage to AOC 504, Investigated Railroad Lines at the CNC 5-2
5.6 Potential Migration Pathways to Surface Water Bodies at the CNC 5-2
5.7 Potential Contamination in Oil/Water Separators (OWSs) 5-3
5.8 Land Use Control Management Plan 5-3
6.0 Recommendations 6-1
7.0 References 7-1

Appendices

A Analytical Data from EnSafe RFI Investigation
B Validation Reports from EnSafe RFI Investigation
C RFI Figure 2.7, *Shallow Groundwater Potentiometric Contours*
D Groundwater Probe Locations
E Responses to SCDHEC Comments

Acronyms and Abbreviations

AOC	area of concern
AST	aboveground storage tank
BCT	BRAC Cleanup Team
BEQ	benzo(a)pyrene equivalent
BRAC	Base Realignment and Closure Act
BRC	background reference concentration
CA	corrective action
CMS	corrective measures study
CNC	Charleston Naval Complex
COC	chemical of concern
COPC	chemical of potential concern
CSI	confirmatory sampling investigation
DAF	dilution attenuation factor
DPT	direct push technology
EnSafe	Ensafe Inc.
EPA	U.S. Environmental Protection Agency
HHRA	human health risk assessment
MCL	maximum contaminant level
mg/kg	milligram per kilogram
NAVBASE	Naval Base
NFA	no further action
NFI	no further investigation
OWS	oil-water separator
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation

SCDHEC	South Carolina Department of Health and Environmental Control
SPLP	synthetic precipitation leaching procedure
SSL	soil screening level
SWMU	solid waste management unit
SAA	satellite accumulation area
SVOC	semivolatile organic compound
UST	underground storage tank
VOC	volatile organic compound

SECTION 1.0

Introduction

1.0 Introduction

In 1993, Naval Base (NAVBASE) Charleston was added to the list of bases scheduled for closure as part of the Defense Base Realignment and Closure Act (BRAC), which regulates closure and transition of property to the community. The Charleston Naval Complex (CNC) was formed as a result of the dis-establishment of the Charleston Naval Shipyard and NAVBASE on April 1, 1996.

Corrective Action (CA) activities are being conducted under the Resource Conservation and Recovery Act (RCRA) with the South Carolina Department of Health and Environmental Control (SCDHEC) as the lead agency for CA activities at the CNC. All RCRA CA activities are performed in accordance with the Final Permit (Permit No. SC0 170 022 560).

In April 2000, CH2M-Jones was awarded a contract to provide environmental investigation and remediation services at the CNC. This submittal has been prepared by CH2M-Jones to complete the RCRA Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 164 in Zone K of the CNC Annex. The site is recommended for No Further Action (NFA). Figure 1-1 illustrates the location of Zone K, in the Naval Annex within the CNC.

1.1 Background

SWMU 164 consists of an abrasive sandblasting booth formerly located in Building 2556 at the Naval Annex. Figure 1-2 presents an aerial photograph of SWMU 164. Building 2556 was constructed in 1983 and used to refurbish and store mines. Various types of equipment were also sandblasted to remove paint. The east side of the building housed the sandblasting booth and a tool shed, which was once used as a drying booth (RFI Figure 10.4.1). The building's west side was used for mine storage. Mine refurbishing continued at Building 2556 until 1993. When the concrete floor in the building was inspected on March 9, 1999, it was in good condition and no cracks were observed. It has been reported that the former blasting booth was near (i.e., within 35 feet of) the exterior doors, thus soil near the doors may have been impacted.

A new blasting booth was installed around 1986 on the site of the former blasting booth, and was comprised of a metal structure on the concrete floor. The booth was installed with a metal grate in the floor to recover abrasive blast media for reuse using a negative pressure system. During operations, exhaust air from the booth, which contained airborne blast media, entered a cyclone separator where particulate matter was removed. However,

fugitive airborne particulate, including lead and cadmium particulate, may have been emitted from this system. Because an exterior bay door was approximately 35 feet from the booth, dust that was noted outside the booth may have migrated from the building and impacted the surrounding soil. An aboveground storage tank (AST) containing fuel oil was also located at the northwest corner of Building 2556. Stains observed on the ground during the 1994 survey could be from leaking pipes leading to Building 2556.

Materials of concern identified in the *Final Zone K RFI Report Work Plan Addendum* for SWMU 164 (EnSafe Inc. [EnSafe], 1999b) were metals, polycyclic aromatic hydrocarbons (PAHs), and petroleum products. To fulfill confirmatory sampling investigation (CSI) objectives, soil was sampled in accordance with the final RFI Work Plan, and as described in Section 3.0 of this RFI Addendum, to confirm whether any contamination resulted from onsite activities at SWMU 164. Groundwater was not sampled in this investigation.

1.2 Purpose of the RFI Addendum

This report provides information about SWMU 164 that documents the conclusions from the RFI report, provides the results of significant additional sampling performed after the RFI report, and supports the recommendation of NFA for SWMU 164.

Prior to changing the status of any site to NFA in the CNC RCRA CA permit, the BRAC Cleanup Team (BCT) agreed that the following issues should be considered:

- Status of the RFI
- Presence of metals (inorganics) in groundwater
- Potential linkage to SWMU 37, Investigated Sanitary Sewers at the CNC
- Potential linkage to Area of Concern (AOC) 699, Investigated Storm Sewers at the CNC
- Potential linkage of AOC 504, Investigated Railroad Lines at the CNC
- Potential linkage to surface water bodies (Zone J)
- Potential contamination associated with oil/water separators (OWSs)
- Relevance or need for land use controls at the site

Information regarding these issues is provided in this RFI Addendum to expedite evaluation of closure of the site.

Provided that the information presented in this addendum is adequate to address these site closeout items, it is expected that the BCT will concur that NFA is appropriate for the site. At that time, a Statement of Basis will be prepared that will be available for public comment

in accordance with SCDHEC policy. This will allow for public participation in the final remedy selection.

1.3 Report Organization

This RFI Addendum consists of the following sections, including this introductory section:

1.0 Introduction — Presents the purpose of the report and background information relating to the RFI Addendum.

2.0 Summary of RFI Conclusions for SWMU 164 — Summarizes the conclusions from the RFI investigations and risk evaluations for SWMU 164.

3.0 Summary of Additional Information— Summarizes information collected after completion of the RFI report.

4.0 COPC/COC Refinement—Provides further evaluation results of aluminum, arsenic, thallium, and BEQs in order to assess them as contaminants of concern (COCs).

5.0 Summary of Information Related to Site Closeout Issues—Discusses the various site closeout issues that the BCT agreed to evaluate prior to site closeout.

6.0 Recommendations—Provides recommendations for proceeding with site closure.

7.0 References — Lists the references used in this document.

Appendix A contains analytical data from sampling subsequent to the RFI report.

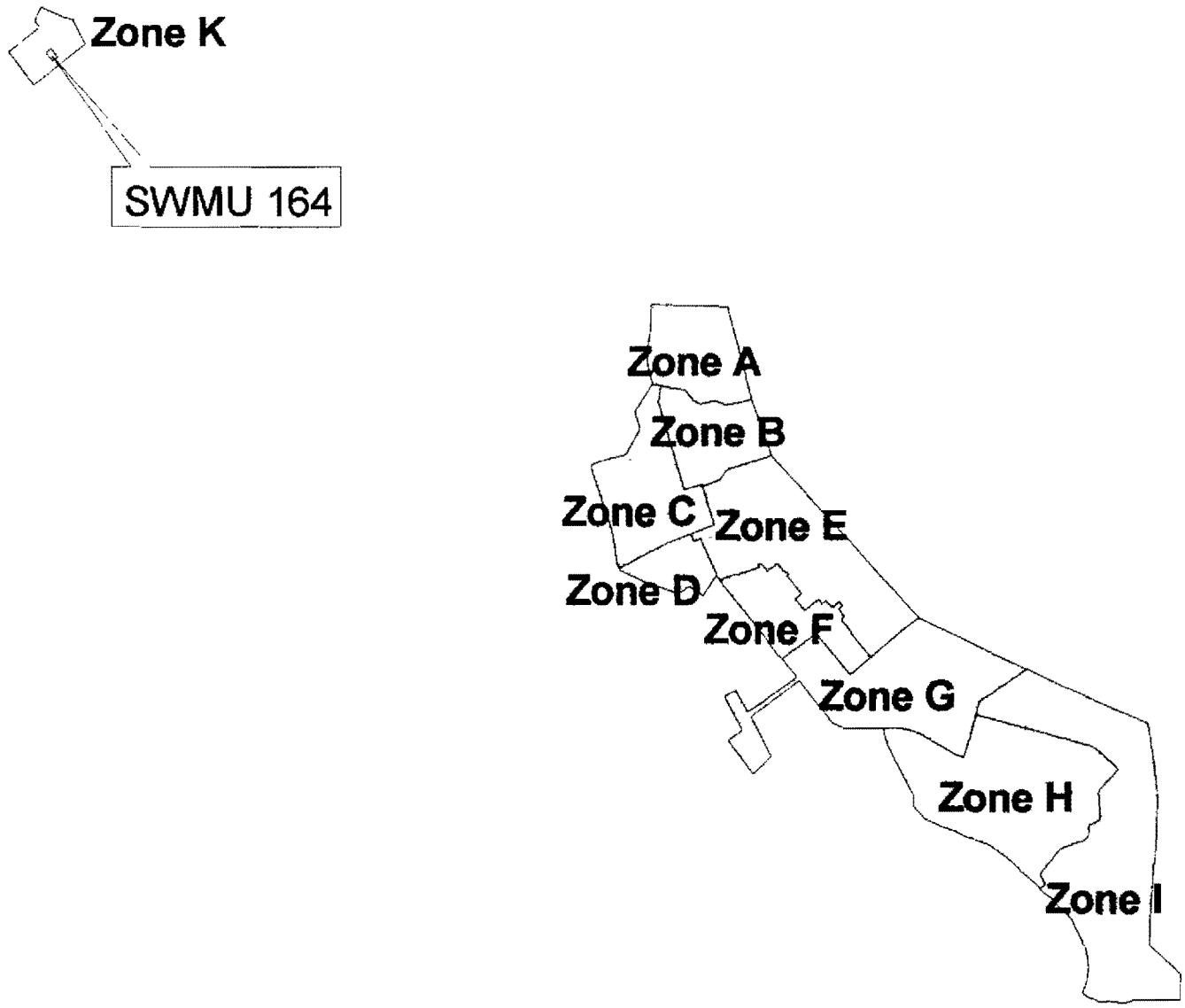
Appendix B contains validation reports from the data from sampling subsequent to the RFI report.

Appendix C contains RFI Figure 2.7, *Shallow Groundwater Potentiometric Contours.*

Appendix D contains a figure depicting the groundwater probe locations for SWMU 164.

Appendix E contains responses to SCDHEC comments.

All tables and figures appear at the end of their respective sections.



N

0 3000 6000 Feet

Figure 1-1
SWMU 164 - Zone K
Zone Map
Charleston Naval Complex

File Path c:\18gis\18gis\ecc 164\cnc-eglsekapr apr. Date May 22, 2001 User RPFEILST\diane

CH2MHILL

Fence
Roads - Lines
AOC Boundary
SWMU Boundary
Zone Boundary

N

0 100 200 Feet

Figure 1-2
SWMU 164
Zone K
Charleston Naval Complex

File Path: c:\18gis\aoc 164\cnc-wgbolupr.apr, Date: 28 Mar 2001 17:20, User: RPFEILST

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SECTION 2.0

Summary of RFI Conclusions for SWMU 164

2.0 Summary of RFI Conclusions for SWMU 164

This section summarizes the results and conclusions from the soil investigations conducted in the area of Building 2556, and which were reported in the *Zone K RFI Report* (EnSafe, 1999a). Figure 2-1 presents the site features and RFI sample locations. The figure includes details of the approximate location of the sandblaster and doors in the building, as well as drainage features around the building.

Initially, soil borings were collected and analyzed from six surface and subsurface soil sample locations (K164SB001, K164SB002, K164SB003, K164SB004, K164SB005, and K164SB006). An additional three surface and subsurface soil samples (K164SB007, K164SB008, and K164SB009) were collected to determine if there was any impact from the storage building to surrounding soil. The outcome of the screening analytical results from the first sampling event were compared to U.S. Environmental Protection Agency (EPA) Region III risk-based concentrations (RBCs) (June 1996), revealing the need for a second soil sampling event to delineate the extent of contamination.

Five additional soil borings (K164SB010, K164SB011, K164SB0012, K164SB013, and K164SB014) were sampled. Three of the additional soil borings were sampled to define the extent of the arsenic detection at K164SB002. The other two soil borings were associated with the semivolatile organic compound (SVOC) detections at K164SB004. Soil test data and conclusions concerning contamination and risk results were presented in the *Zone K RFI Report*. Conclusions from the RFI report are summarized below. A further evaluation of COCs is provided in Section 4.0 of this addendum.

2.1 Surface Soil

The nature of contamination section (10.4.2), concludes that no volatile organic compounds (VOCs), dioxin (TEQ), TPH-DRO, or pesticide/polychlorinated biphenyl (PCB) chemicals were detected above the EPA Region III residential RBCs or soil screening levels (SSLs) for surface soil. The RFI reported that three samples exceeded the benzo(a)pyrene equivalent (BEQ) residential RBC, and six samples exceeded the residential RBC, SSL, and background reference concentration (BRC) for arsenic. No other organics or inorganics exceeded screening criteria (residential RBCs, BRCs, and SSLs).

The fate and transport section of the RFI Report (10.4.3) notes the only exceedances of SSLs (dilution attenuation factor [DAF] = 10) were limited to one of benzo(a)anthracene and two

of arsenic, both in surface soil. Thus, the report concludes that the soil-to-groundwater pathway is not significant. No VOCs were detected in surface soil samples, and as a result, the soil-to-air migration pathway is not significant at SWMU 164.

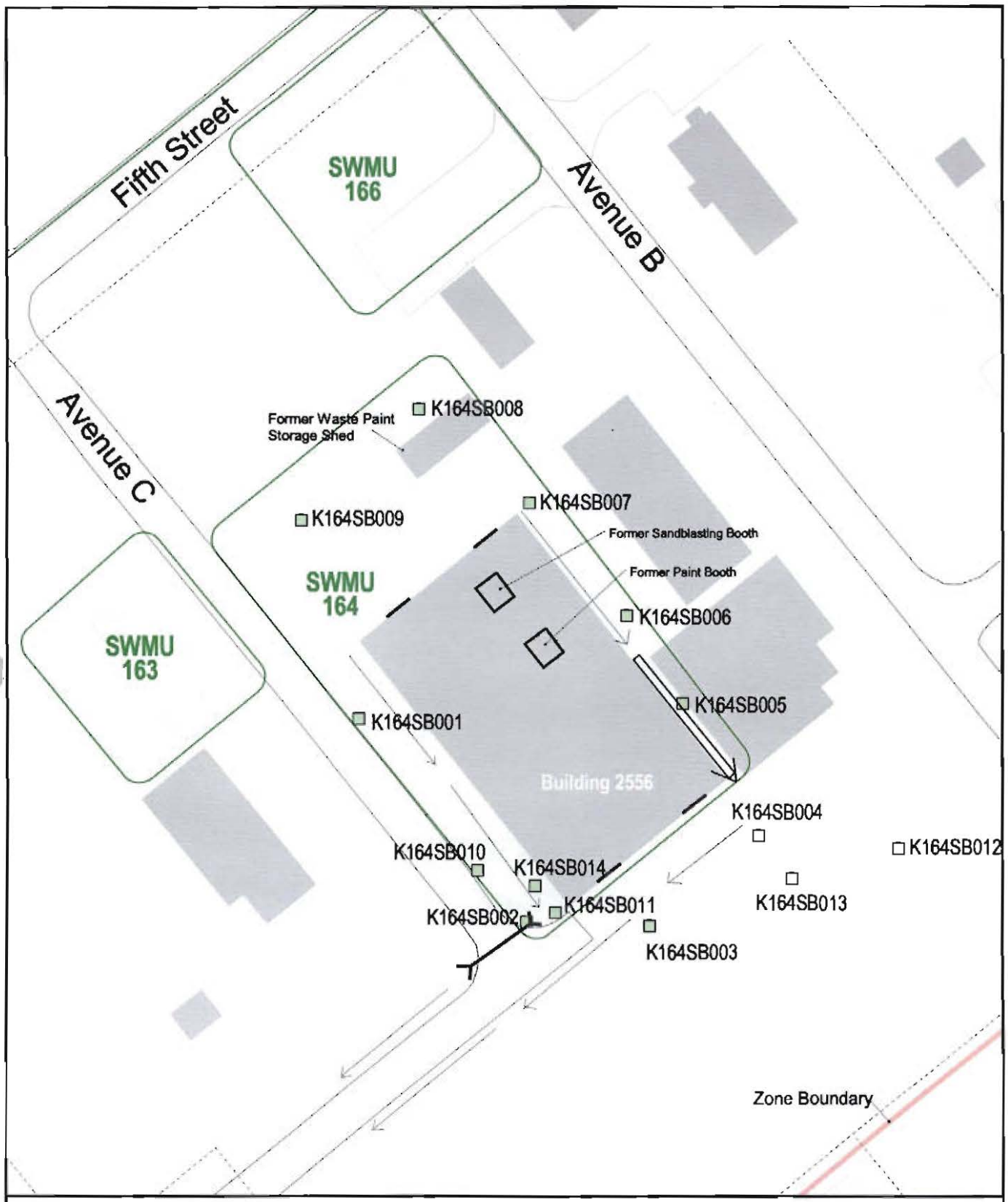
The human health risk assessment (HHRA) section (10.4.4) concludes that BEQs and arsenic were chemicals of potential concern (COPCs) in surface soil. A Wilcoxon rank sum test analysis presented aluminum as a COPC based on a BRC comparison. Benzo(a)pyrene, aluminum, and arsenic were identified as (surface) soil pathway COCs for future residents; benzo(a)pyrene and arsenic were identified as COCs for site workers (industrial land use scenario).

2.2 Subsurface Soil

The nature of contamination section (10.4.2), concludes that no SVOCs, TPH-DRO, or inorganic chemicals were detected above the appropriate SSLs or BRCs for subsurface soil. The fate and transport section (10.4.3) notes that there were no exceedances of SSLs in subsurface soil and no VOCs were detected in surface soil samples collected at SWMU 164, thus the soil-to-groundwater and soil–to-air migration pathways are not significant. No COPCs were identified for subsurface soil.

2.3 Groundwater

No groundwater samples were collected at SWMU 164 during the original RFI activities.



Original RFI Soil Samples
Fence
Roads
Pavement
AOC Boundary
SWMU Boundary
Buildings
Surface Water Flow Direction
Concrete Gutter
Culvert
Door

20 0 20 40 Feet

Note: Original Figure Created in Color

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Figure 2-1
Original RFI Soil Boring Locations and Site Features
SWMU 164 - Zone K
Charleston Naval Complex

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SECTION 3.0

Summary of Additional Information

3.0 Summary of Additional Information

This section summarizes the results and conclusions from the additional RFI investigations planned and performed by EnSafe based on the *Final Zone K RFI Report Work Plan Addendum* (EnSafe, 1999b). These results have not yet been formally presented to SCDHEC.

During 1999 and 2000, field activities were conducted subsequent to the RFI Report. According to the *Final Zone K RFI Report Work Plan Addendum*, soil data gaps were identified and soil samples were collected to perform the following tasks:

- Conduct SPLP tests for metals and SVOCs
- Define the extent of BEQs and arsenic in surface soil
- Investigate potential VOCs associated with the former satellite accumulation area (SAA)
- Delineate potential VOC or SVOC impacts from the AST
- Investigate potential VOC and metal contamination via runoff into the drainage ditch

The data from the additional investigations are summarized in this section. Analytical data and validation reports are provided in Appendices A and B, respectively.

3.1 Soil Sampling and Analysis

During the additional investigations at SWMU 164, soil samples were collected at 26 locations, as shown in Figure 3-1. Samples were analyzed for metals from surface and subsurface depths at 15 locations. Of these samples, synthetic precipitation leaching procedure (SPLP) metals tests were also run on three surface and four subsurface samples. Samples were analyzed for VOCs from surface and subsurface depths at eight locations, and for SVOCs at 11 locations. One surface sample was analyzed for SPLP SVOCs. Samples and corresponding analyses are summarized in Table 3-1.

Original RFI sample stations K164SB001, K164SB002, K164SB004, K164SB005, and K164SB006 were resampled during the additional investigation, and new soil sample stations (K164SB015 through K164SB035) were sampled. Locations of stations at which additional soil samples were collected are shown in Figure 3-1. Tables 3-2 through 3-5 present summary results of the detected analytes from these additional investigations for surface and subsurface soil.

These tables show all detections and compare them to the appropriate screening criteria as follows:

- The criteria for surface soil are EPA Region III residential RBCs, SSLs (DAF=10), and BRCs (Zone K, CNC Annex background).
- The criteria for subsurface soil are SSLs (DAF=10) and BRCs (Zone K, CNC Annex background).

Concentrations that exceed the screening criteria are in bold and outlined in boxes within the table. Appendix A provides the detailed analytical data.

The following subsections discuss exceedances noted in the tables. Further evaluation of these exceedances is provided in Section 4.0.

3.1.1 Aluminum

No surface sample result exceeded the greater of the RBC[1] or BRC[2] for aluminum. The aluminum concentrations in two subsurface sample locations (K164SB016: 12,600 milligrams per kilogram [mg/kg] and K164SB023: 12,200 mg/kg) exceeded the subsurface soil estimated BRC value of 10,500 mg/kg. No generic SSL[3] for aluminum is listed in the *EPA Soil Screening Guidance* (1996).

3.1.2 Arsenic

Figure 3-2 shows the results of all samples tested for arsenic (RFI and additional tests). Higher concentrations of arsenic were detected in the southeast corner of SWMU 164 (at the intersection of Sixth Street and Avenue C) in both the upper and lower intervals sampled than elsewhere on the site. In this area, four surface sample locations had detectable levels of arsenic (K164SB002: 21.9 mg/kg, K164SB017: 3.4 mg/kg, K164SB018: 18.5 mg/kg, and K164SB022: 7.2 mg/kg). No surface sample result exceeded the greater of the RBC[4] or BRC[5] for arsenic in surface soil.

One subsurface sample location (K164SB002: 38.5 mg/kg) reported arsenic concentrations above the SSL (DAF=10) concentration (14.5 mg/kg) and BRC screening criteria (1.98 mg/kg).

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[1] Residential RBCs were obtained from the EPA Region III, RBC Tables, October 5, 2000

[2] *Zone K RFI Report*, Section 5 – Data Evaluation and Background

[3] Generic soil-to-groundwater SSLs (DAF = 10) are from *EPA Soil Screening Guidance. Technical Background Document* (Table A-1), EPA/540/R-95/128, May 1996

[4] Residential RBCs were obtained from the EPA Region III, RBC Tables, October 5, 2000

[5] *Zone K RFI Report*, Section 5 – Data Evaluation and Background

3.1.3 Thallium

Five subsurface sample locations (K164SB021: 0.5(J) mg/kg[6], K164SB022: 0.46(J) mg/kg, K164SB023: 0.52(J) mg/kg, K164SB024: 0.44(J) mg/kg, and K164SB034: 0.57(J) mg/kg) reported thallium concentrations above the SSL (DAF = 10) concentration (0.35 mg/kg).

3.1.4 BEQs

Figure 3-3 shows the results of all samples tested for BEQs (RFI and additional tests). Four 1999 surface soil sample locations (K164SB004: 0.225 mg/kg, K164SB029: 0.232 mg/kg, K164SB031: 0.252 mg/kg, and K164SB032: 0.404 mg/kg) reported BEQ concentrations above the BRC (0.088 mg/kg). The more recent analytical data reported lower instrument detection limits than previous RFI BEQ data, and used half of the reported detection limit value for non-detected PAHs. See Section 4.1.2 for further discussion.

3.2 Groundwater

No groundwater samples were collected at SWMU 164.

3.3 Background Soil Sampling

Recent sampling was conducted in 2001 by CH2M-Jones to characterize anthropogenic background levels for PAHs and arsenic in Zone K, CNC Annex. Six surface and three subsurface soil samples were collected as part of this background sampling effort. The arsenic concentrations in the recent background surface soil ranged from 1 to 92 mg/kg, with a mean concentration of 18 mg/kg, and two times the mean of 36 mg/kg. In the subsurface soil, background concentrations ranged from <1 to 6 mg/kg, with a mean concentration of 2.3 mg/kg, and two times the mean of 4.6 mg/kg.

The PAH samples had very few detections at low levels. The PAHs measured as BEQs in surface soil samples ranged from 0.041 to 0.050 mg/kg. with a mean concentration of 0.044 mg/kg, and two times the mean of 0.088 mg/kg. There were no subsurface BEQ detections in the background samples.

A preliminary summary of this data has been presented as separate technical memorandum to the BCT.

[6] J indicates that the chemical is detected at a concentration below the method detection limit; the concentration is not known.

TABLE 3-1
Summary of Additional Sampling and Analyses
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

	Analytical Tests Completed				
Location	**VOCs**	**SVOCs**	**Metals**	**SPLS Metals**	**SPLP SVOCs**
164SB001[a]			SS,SB	SS,SB	
164SB002[a]	[b]		SS,SB	SS,SB	
164SB004[a]		SS,SB			SS,SB
164SB005[a]			SB	SB	
164SB006[a]			SS,SB	SS,SB	
164SB015	SS		SS		
164SB016			SS,SB		
164SB017			SS,SB		
164SB018			SS,SB		
164SB019			SS,SB		
164SB020			SS,SB		
164SB021		SS,SB	SS,SB		
164SB022			SS,SB		
164SB023			SS,SB		
164SB024			SS,SB		
164SB025	SS,SB	SS,SB			
164SB026	SS,SB	SS,SB			
164SB027	SS,SB	SS,SB			
164SB028	SS,SB	SS,SB			
164SB029	SS,SB	SS,SB			
164SB030	SS,SB	SS,SB			
164SB031	SS,SB	SS,SB			
164SB032	SS,SB	SS,SB			
164SB033		SS,SB			
164SB034			SS,SB		
164SB035			SS,SB		

[a] This location was also sampled in 1996.
[b] Napthalene and SPLP napthalene were analyzed on SS and SB samples.

SS Surface soil sample
SB Subsurface soil sample

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC
Aluminum	K164SB001	8,030	mg/kg	=	7,800	NL	11,200
	K164SB002	9,410		=			
	K164SB006	7,390		=			
	K164SB015	5,430		=			
	K164SB016	9,580		=			
	K164SB017	6,230		=			
	K164SB018	7,260		=			
	K164SB019	8,680		=			
	K164SB020	7,010		=			
	K164SB021	10,400		=			
	K164SB022	7,560		=			
	K164SB023	4,970		=			
	K164SB024	4,630		=			
	K164SB034	8,630		=			
	K164SB035	6,910		=			
Antimony	K164SB002	0.33	mg/kg	J	3.1	2.5	0.45
	K164SB021	0.43		J			
	K164SB022	0.48		J			
	K164SB024	0.45		J			
	K164SB034	0.38		J			
Arsenic	K164SB001	1.6	mg/kg	=	0.43 C	14.5	35.9[c]
	K164SB002	21.9		=			
	K164SB006	2.3		=			
	K164SB015	1.5		=			
	K164SB016	3		=			
	K164SB017	3.4		=			
	K164SB018	18.5		=			
	K164SB019	1.2		=			
	K164SB020	1.2		=			
	K164SB021	1.4		=			
	K164SB022	7.2		=			
	K164SB023	1.6		=			
	K164SB024	2.3		=			
	K164SB034	1.5		=			
	K164SB035	2.8		=			
Barium	K164SB001	21.4	mg/kg	=	550	800	25.6
	K164SB002	21.3		=			

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC
Barium	K164SB006	15.1	mg/kg	=	550	800	25.6
	K164SB015	12.8		=			
	K164SB016	18.5		=			
	K164SB017	19.9		=			
	K164SB018	13.8		=			
	K164SB019	13.3		=			
	K164SB020	8.5		=			
	K164SB021	16.3		=			
	K164SB022	14.5		=			
	K164SB023	13.3		=			
	K164SB024	17.5		=			
	K164SB034	9.8		=			
	K164SB035	10.3		=			
Beryllium	K164SB001	0.07	mg/kg	J	16	31.5	0.17
	K164SB002	0.16		J			
	K164SB006	0.05		J			
	K164SB015	0.12		J			
	K164SB016	0.15		J			
	K164SB017	0.47		=			
	K164SB018	0.13		J			
	K164SB019	0.05		J			
	K164SB020	0.05		J			
	K164SB021	0.17		J			
	K164SB022	0.16		J			
	K164SB023	0.17		J			
	K164SB024	0.51		J			
	K164SB034	0.16		J			
Cadmium	K164SB001	1.1	mg/kg	=	7.8	4	0.13
	K164SB002	1.4		=			
	K164SB006	0.51		J			
	K164SB015	2.1		=			
	K164SB016	0.26		J			
	K164SB017	0.19		J			
	K164SB018	0.35		J			
	K164SB021	0.24		J			
	K164SB022	2.4		J			
	K164SB023	0.13		J			
	K164SB024	0.18		J			
	K164SB034	0.06		J			

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC
Cadmium	K164SB035	0.59	mg/kg	J	7.8	4	0.13
Calcium	K164SB001	3,710	mg/kg	J	NA	NA	NA
	K164SB002	13,900		J			
	K164SB006	2,090		J			
	K164SB015	1,560		=			
	K164SB016	4,220		=			
	K164SB017	14,900		=			
	K164SB018	4,530		=			
	K164SB019	112		=			
	K164SB020	305		=			
	K164SB021	339		=			
	K164SB022	2,830		=			
	K164SB023	4,400		=			
	K164SB024	17,000		=			
	K164SB034	471		J			
	K164SB035	1,940		=			
Chromium, Total	K164SB001	8.5	mg/kg	=	23	19	8.4
	K164SB001	2.7		J			
	K164SB002	14.4		=			
	K164SB002	7.4		J			
	K164SB006	9.7		=			
	K164SB006	5.9		J			
	K164SB015	7.6		=			
	K164SB016	11.8		=			
	K164SB017	9.8		=			
	K164SB018	8.4		=			
	K164SB019	7.5		=			
	K164SB020	5.8		=			
	K164SB021	7.7		J			
	K164SB022	12.5		=			
	K164SB023	6.1		=			
	K164SB024	10.7		=			
	K164SB034	6.6		=			
	K164SB035	7.2		=			
Cobalt	K164SB001	0.63	mg/kg	J	470	NL	0.34
	K164SB002	1.4		=			
	K164SB006	0.76		J			
	K164SB015	0.74		J			

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC
Cobalt	K164SB016	0.86	mg/kg	J	470	NL	0.34
	K164SB017	0.9		J			
	K164SB018	0.49		J			
	K164SB019	0.28		J			
	K164SB020	0.14		J			
	K164SB021	0.65		J			
	K164SB022	1.1		J			
	K164SB023	0.66		J			
	K164SB024	1.8		J			
	K164SB034	0.37		J			
	K164SB035	0.41		J			
Copper	K164SB001	3.9	mg/kg	=	310	5,500[d]	2.1[c]
	K164SB002	8.1		=			
	K164SB006	6.6		=			
	K164SB015	5.8		=			
	K164SB016	3.9		=			
	K164SB017	1.8		J			
	K164SB018	3		=			
	K164SB019	0.61		J			
	K164SB020	2.4		=			
	K164SB021	5.3		=			
	K164SB022	9.7		=			
	K164SB023	2		J			
	K164SB024	2.4		J			
	K164SB034	0.89		J			
	K164SB035	2.5		J			
Iron	K164SB001	3,610	mg/kg	=	2,300	NL	7,060
	K164SB002	3,370		=			
	K164SB006	2,440		=			
	K164SB015	1,900		=			
	K164SB016	3,760		=			
	K164SB017	3,310		=			
	K164SB018	3,630		=			
	K164SB019	4,820		=			
	K164SB020	4,200		=			
	K164SB021	2,610		=			
	K164SB022	4,510		=			
	K164SB023	2,310		=			
	K164SB024	2,080		=			

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC
Iron	K164SB034	4,700	mg/kg	=	2,300	NL	7,060
	K164SB035	6,760		=			
Lead	K164SB001	16.2	mg/kg	=	400[e]	400[f]	39.6
	K164SB002	36.5		=			
	K164SB006	57		=			
	K164SB015	25.2		=			
	K164SB016	66		J			
	K164SB017	6.9		J			
	K164SB018	12.8		J			
	K164SB019	5		J			
	K164SB020	7.6		J			
	K164SB021	18.6		=			
	K164SB022	42.1		=			
	K164SB023	16.7		=			
	K164SB024	6.1		=			
	K164SB034	7.3		=			
	K164SB035	18.7		=			
Magnesium	K164SB001	315	mg/kg	=	NA	NA	NA
	K164SB002	414		=			
	K164SB006	232		=			
	K164SB015	244		=			
	K164SB016	330		=			
	K164SB017	276		=			
	K164SB018	225		=			
	K164SB019	195		=			
	K164SB020	125		=			
	K164SB021	242		J			
	K164SB022	315		=			
	K164SB023	178		=			
	K164SB024	279		=			
	K164SB034	210		=			
	K164SB035	228		=			
Manganese	K164SB001	15.1	mg/kg	=	1,100	NL	26.4
	K164SB002	24		=			
	K164SB006	15.7		=			
	K164SB015	10.8		=			
	K164SB016	14.8		=			
	K164SB017	14.1		=			

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC
Manganese	K164SB018	12.2	mg/kg	=	1,100	NL	26.4
	K164SB019	11.6		=			
	K164SB020	6.8		=			
	K164SB021	11.2		J			
	K164SB022	17.3		=			
	K164SB023	12.9		=			
	K164SB024	17.4		=			
	K164SB034	13.9		=			
	K164SB035	10.7		=			
Mercury	K164SB001	0.04	mg/kg	=	2.3[g]	1	NA
	K164SB002	0.05		=			
	K164SB006	0.04		=			
	K164SB015	0.02		=			
	K164SB016	0.05		=			
	K164SB017	0.03		=			
	K164SB018	0.02		=			
	K164SB019	0.03		=			
	K164SB020	0.03		=			
	K164SB021	0.03		=			
	K164SB022	0.04		=			
	K164SB023	0.04		=			
	K164SB024	0.04		=			
	K164SB034	0.06		=			
	K164SB035	0.05		J			
Nickel	K164SB001	2.4	mg/kg	J	160	65	1.7
	K164SB002	6.3		=			
	K164SB006	3.2		J			
	K164SB015	2.7		J			
	K164SB016	4.1		J			
	K164SB017	4.4		J			
	K164SB018	3		J			
	K164SB019	3.1		J			
	K164SB020	2		J			
	K164SB021	2.7		J			
	K164SB022	3.8		J			
	K164SB023	2.7		J			
	K164SB024	3.2		J			
	K164SB034	3		J			
	K164SB035	2.3		J			

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC
Potassium	K164SB001	126	mg/kg	=	NA	NA	NA
	K164SB002	246		=			
	K164SB006	135		=			
	K164SB015	149		=			
	K164SB016	150		=			
	K164SB017	173		=			
	K164SB018	125		=			
	K164SB019	98.2		J			
	K164SB020	62.6		J			
	K164SB021	98.8		J			
	K164SB022	151		J			
	K164SB023	114		J			
	K164SB024	181		J			
	K164SB034	94.3		J			
	K164SB035	70.2		J			
Selenium	K164SB002	0.49	mg/kg	J	39	2.5	0.84
	K164SB017	0.54		J			
	K164SB021	0.44		J			
	K164SB022	0.52		J			
	K164SB034	0.41		J			
	K164SB035	0.72		=			
Sodium	K164SB001	42.2	mg/kg	J	NA	NA	NA
	K164SB002	308		=			
	K164SB006	34.1		J			
	K164SB017	271		=			
	K164SB018	133		=			
	K164SB022	280		J			
	K164SB023	282		J			
	K164SB024	627		=			
	K164SB034	241		J			
	K164SB035	205		J			
Thallium	K164SB019	0.36	mg/kg	J	0.55	0.35	NA
Vanadium	K164SB001	10.2	mg/kg	=	55	3,000	15.8
	K164SB002	15.2		=			
	K164SB006	8.6		=			
	K164SB015	7.6		=			
	K164SB016	14.1		=			
	K164SB017	13.9		=			

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC
Vanadium	K164SB018	11.8	mg/kg	=	55	3,000	15.8
	K164SB019	11.8		=			
	K164SB020	10.2		=			
	K164SB021	11		=			
	K164SB022	12.9		=			
	K164SB023	8		=			
	K164SB024	10.8		=			
	K164SB034	11.3		=			
	K164SB035	12.1		=			
Zinc	K164SB001	34.1	mg/kg	J	2,300	6,000	14.8
	K164SB002	86.7		J			
	K164SB006	73		J			
	K164SB015	141		=			
	K164SB016	45.9		J			
	K164SB017	10.2		J			
	K164SB018	467		J			
	K164SB021	24.3		J			
	K164SB022	95.4		=			
	K164SB023	21		=			
	K164SB024	15		=			
	K164SB034	4.2		=			
	K164SB035	46.1		J			

Concentrations in bolded and outlined text exceed the RBCs, SSLs, and the zone background screening criteria.

[a] Residential RBCs (HI=0.1 for noncarcinogens) were obtained from the EPA Region III RBC Table, October 5, 2000 (http://www.epa.gov/eaphome/search.html), unless otherwise noted.

[b] Generic soil-to-groundwater SSLs (DAF = 10) from *EPA Soil Screening Guidance: Technical Background Document* (Table A-1), EPA/540/R-95/128, May 1996, unless otherwise noted.

[c] *Preliminary Results for Additional Background PAH Sampling from CNC Main Base Railroad Lines and Annex (Zone K)*, May 3, 2001, CH2M-Jones.

[d] Generic soil-to-groundwater SSLs (DAF = 10), from the EPA Region III RBC Table, October 5, 2000 (http://www.epa.gov/eaphome/search.html).

[e] Residential RBC for lead was obtained from *EPA Soil Screening Guidance: Technical Background Document*, Appendix A (page A-5) EPA/540/R-95/128, May 1996.

[f] Based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, U.S. EPA, 1994.

[g] Residential RBC (ThQ=0 1) for mercury was obtained from the EPA Region III RBC Table, October 22, 1997.

C Carcinogen-residential RBC was used directly from the EPA Region III RBC Table, October 5, 2000.

TABLE 3-2
Additional Surface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)	Soil-to-Groundwater SSL[b] (DAF=10)	Surface Soil BRC

= indicates that the chemical is detected at the concentration shown.

J indicates that the chemical is detected at a concentration below the method detection limit; the concentration is not known.

HI hazard index
NL not listed
NA not applicable/not available/not analyzed
RBC risk-based concentration
ThQ target hazard quotient

Note: All background values for Zone K, CNC Annex are based on twice the mean of the grid sample concentrations, as described in the *Zone K RFI Report*, Section 5 – Data Evaluation and Background Comparison (EnSafe, 1999a).

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC
Aluminum	K164SB001	7,900	mg/kg	=	NL	10,500
	K164SB002	9,480		=		
	K164SB005	8,160		=		
	K164SB006	6,520		=		
	K164SB016	**12,600**		=		
	K164SB017	4,240		=		
	K164SB018	4,950		=		
	K164SB019	6,310		=		
	K164SB020	8,790		=		
	K164SB021	7,420		=		
	K164SB022	9,520		=		
	K164SB023	**12,200**		=		
	K164SB024	9,700		=		
	K164SB034	5,510		=		
	K164SB035	5,030		=		
Arsenic	K164SB001	1.1	mg/kg	J	14.5	4.6[b]
	K164SB002	**38.5**		=		
	K164SB005	1.1		J		
	K164SB006	0.84		J		
	K164SB016	1.4		=		
	K164SB017	2.3		=		
	K164SB018	0.64		J		
	K164SB019	0.72		J		
	K164SB020	1.9		=		
	K164SB021	1.6		=		
	K164SB022	1.2		J		
	K164SB023	1		J		
	K164SB024	2		=		
	K164SB034	0.68		J		
	K164SB035	0.23		J		
Barium	K164SB001	8.6	mg/kg	=	800	6.83
	K164SB002	11.6		=		

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC
Barium	K164SB005	13.2	mg/kg	=	800	6.83
	K164SB006	8.6		=		
	K164SB016	13		=		
	K164SB017	3		=		
	K164SB018	4.2		=		
	K164SB019	5.7		=		
	K164SB020	4.6		=		
	K164SB021	6.9		=		
	K164SB022	7.6		=		
	K164SB023	13		=		
	K164SB024	6.4		=		
	K164SB034	3.2		=		
	K164SB035	4.1		=		
Beryllium	K164SB001	0.06	mg/kg	J	31.5	0.12
	K164SB002	0.03		J		
	K164SB005	0.05		J		
	K164SB016	0.17		J		
	K164SB017	0.04		J		
	K164SB018	0.04		J		
	K164SB019	0.05		J		
	K164SB020	0.06		J		
	K164SB021	0.12		J		
	K164SB022	0.13		J		
	K164SB023	0.14		J		
	K164SB024	0.11		J		
Cadmium	K164SB002	0.1	mg/kg	J	4	NA
	K164SB005	0.06		J		
	K164SB022	0.17		J		
	K164SB035	0.59		J		
Calcium	K164SB001	566	mg/kg	J	NA	NA
	K164SB002	2,160		J		
	K164SB005	1,500		J		
	K164SB006	461		J		
	K164SB016	238		=		

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC
Calcium	K164SB017	78.2	mg/kg	=	NA	NA
	K164SB018	33.4		J		
	K164SB019	39.9		J		
	K164SB020	36.1		J		
	K164SB021	75.1		=		
	K164SB022	254		J		
	K164SB023	191		J		
	K164SB024	120		J		
	K164SB034	75.8		J		
	K164SB035	447		J		
Chromium, Total	K164SB001	5.8	mg/kg	=	19	8.76
	K164SB002	9.6		=		
	K164SB005	6.5		=		
	K164SB006	6.8		=		
	K164SB016	10.3		=		
	K164SB017	5.4		=		
	K164SB018	4.2		=		
	K164SB019	6.5		=		
	K164SB020	7.4		=		
	K164SB021	7.2		J		
	K164SB022	8.5		=		
	K164SB023	9.1		=		
	K164SB024	11.2		=		
	K164SB034	4.8		=		
	K164SB035	4.1		=		
Cobalt	K164SB001	0.18	mg/kg	J	990[c]	0.62
	K164SB002	0.56		J		
	K164SB005	0.58		J		
	K164SB006	0.36		J		
	K164SB016	0.71		J		
	K164SB017	0.19		J		
	K164SB018	0.46		J		
	K164SB019	0.46		J		
	K164SB020	0.43		J		

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC
Cobalt	K164SB021	0.54	mg/kg	J	990[c]	0.62
	K164SB022	1.1		J		
	K164SB023	0.83		J		
	K164SB024	0.51		J		
	K164SB034	0.62		J		
	K164SB035	0.26		J		
Copper	K164SB001	0.59	mg/kg	J	5,500[d]	1.2[b]
	K164SB002	1.9		J		
	K164SB005	1.4		J		
	K164SB006	2.6		=		
	K164SB016	0.57		J		
	K164SB017	0.22		J		
	K164SB018	0.25		J		
	K164SB019	0.4		J		
	K164SB020	0.38		J		
	K164SB021	1.1		J		
	K164SB022	1.7		J		
	K164SB023	0.59		J		
	K164SB024	0.61		J		
	K164SB034	0.58		J		
Iron	K164SB001	1,430	mg/kg	=	NL	5,130
	K164SB002	2,070		=		
	K164SB005	1,700		=		
	K164SB006	1,160		=		
	K164SB016	2,990		=		
	K164SB017	1,290		=		
	K164SB018	2,600		=		
	K164SB019	3,540		=		
	K164SB020	4,330		=		
	K164SB021	2,140		=		
	K164SB022	4,640		=		
	K164SB023	1,770		=		
	K164SB024	1,930		=		
	K164SB034	2,020		=		

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC
Iron	K164SB035	845	mg/kg	=	NL	5,130
Lead	K164SB001	6.2	mg/kg	=	400[e]	6.43
	K164SB002	8.9		=		
	K164SB005	14.7		=		
	K164SB006	9.6		=		
	K164SB016	9.4		J		
	K164SB017	2.4		J		
	K164SB018	3.5		J		
	K164SB019	3.8		J		
	K164SB020	3.5		J		
	K164SB021	5.2		=		
	K164SB022	5		=		
	K164SB023	5.7		=		
	K164SB024	4.8		=		
	K164SB034	2.6		=		
	K164SB035	6		=		
Magnesium	K164SB001	144	mg/kg	=	NA	NA
	K164SB002	227		=		
	K164SB005	255		=		
	K164SB006	225		=		
	K164SB016	309		=		
	K164SB017	59.7		=		
	K164SB018	88.7		=		
	K164SB019	133		=		
	K164SB020	128		=		
	K164SB021	191		J		
	K164SB022	292		=		
	K164SB023	369		=		
	K164SB024	173		=		
	K164SB034	98.1		=		
	K164SB035	117		=		
Manganese	K164SB001	9.6	mg/kg	=	NL	5.93
	K164SB002	7.7		=		
	K164SB005	10.7		=		

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC
Manganese	K164SB006	10.9	mg/kg	=	NL	5.93
	K164SB016	7.2		=		
	K164SB017	3.8		=		
	K164SB018	4.1		=		
	K164SB019	7.8		=		
	K164SB020	6.3		=		
	K164SB021	6.3		J		
	K164SB022	8.6		=		
	K164SB023	8.1		=		
	K164SB024	4.4		=		
	K164SB034	4.3		=		
	K164SB035	3		=		
Mercury	K164SB001	0.02	mg/kg	=	1	NA
	K164SB002	0.04		=		
	K164SB005	0.05		=		
	K164SB006	0.02		J		
	K164SB016	0.05		=		
	K164SB017	0.03		=		
	K164SB018	0.01		J		
	K164SB019	0.01		J		
	K164SB020	0.02		J		
	K164SB021	0.02		=		
	K164SB022	0.03		J		
	K164SB023	0.06		=		
	K164SB024	0.07		=		
	K164SB034	0.02		J		
	K164SB035	0.03		J		
Nickel	K164SB001	1.6	mg/kg	J	65	2.64
	K164SB002	3.8		J		
	K164SB005	2.1		J		
	K164SB006	1.4		J		
	K164SB016	3.5		J		
	K164SB017	1.8		J		
	K164SB018	2.5		J		

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC
Nickel	K164SB019	3.6	mg/kg	J	65	2.64
	K164SB020	3		J		
	K164SB021	2.2		J		
	K164SB022	3.9		J		
	K164SB023	3.		J		
	K164SB024	2.9		J		
	K164SB034	2.9		J		
	K164SB035	1.5		J		
Potassium	K164SB001	71.5	mg/kg	J	NA	NA
	K164SB002	135		=		
	K164SB005	163		=		
	K164SB006	168		=		
	K164SB016	169		=		
	K164SB017	48.6		J		
	K164SB018	66.7		J		
	K164SB019	79.3		J		
	K164SB020	74		J		
	K164SB021	90.6		J		
	K164SB022	146		J		
	K164SB023	173		J		
	K164SB024	101		J		
	K164SB034	50.9		J		
	K164SB035	57.7		J		
Selenium	K164SB035	0.53	mg/kg	J	2.5	0.52
Silver	K164SB018	0.06	mg/kg	J	17	0.42
Sodium	K164SB002	53.9	mg/kg	J	NA	NA
	K164SB005	24.3		J		
	K164SB006	26		J		
	K164SB022	277		J		
	K164SB023	286		J		
	K164SB024	237		J		
	K164SB034	212		J		
	K164SB035	186		J		

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC
Thallium	K164SB021	**0.5**	mg/kg	J	0.35	NA
	K164SB022	**0.46**		J		
	K164SB023	**0.52**		J		
	K164SB024	**0.44**		J		
	K164SB034	**0.57**		J		
Vanadium	K164SB001	7.4	mg/kg	=	3,000	12.2
	K164SB002	12.5		=		
	K164SB005	8.2		=		
	K164SB006	9.2		=		
	K164SB016	15.9		=		
	K164SB017	9 2		=		
	K164SB018	7.30		=		
	K164SB019	7.7		=		
	K164SB020	16.3		=		
	K164SB021	11.4		=		
	K164SB022	11.9		=		
	K164SB023	12.4		=		
	K164SB024	17.1		=		
	K164SB034	7.7		=		
	K164SB035	3.6		=		
Zinc	K164SB001	5.5	mg/kg	J	6,000	NA
	K164SB002	15.1		J		
	K164SB005	17.2		J		
	K164SB006	9.6		J		
	K164SB018	16.2		J		
	K164SB021	5.7		J		
	K164SB022	9.6		=		
	K164SB023	4.9		=		
	K164SB024	3.1		=		
	K164SB034	3		=		
	K164SB035	3.3		J		

Concentrations in bolded and outlined text exceed SSLs and the zone background screening criteria.

TABLE 3-3
Additional Subsurface Soil Inorganic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10	Subsurface Soil BRC

[a] Generic soil-to-groundwater SSLs (DAF = 10) from *EPA Soil Screening Guidance: Technical Background Document* (Table A-1). EPA/540/R-95/128. May, 1996 (unless otherwise noted).

[b] *Preliminary Results for Additional Background PAH Sampling from CNC Main Base Railroad Lines and Annex (Zone K).* May 3, 2001. CH2M-Jones.

[c] Where SSLs are not available from EPA Tables, EnSafe-calculated soil-to-groundwater SSLs are used (based on *EPA Soil Screening Guidance*, May 1996).

[d] Generic soil-to-groundwater SSLs (DAF = 10), were obtained from the EPA Region III RBC Table, October 5, 2000 (http://www.epa.gov/eaphome/search.html).

[e] Based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities.* EPA, 1994.

= indicates that the chemical is detected at the concentration shown.

J indicates that the chemical is detected at a concentration below the method detection limit; the concentration is not known.

DAF dilution attenuation factor

NA not applicable/not available/not analyzed

NL not listed

SSL soil screening level

Note: All background reference concentration values for Zone K-Annex are based on twice the mean of the grid sample concentrations, as described in the *Zone K RFI Report*, Section 5 – Data Evaluation and Background Comparison Also, see footnote b above.

TABLE 3-4
Additional Surface Soil Organic Analytical Results---Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)
Benzo(a)anthracene	K164SB004	0 039	mg/kg	J	0 87C
	K164SB029	0.031		J	
	K164SB031	0.026		J	
Benzo(a)pyrene	K164SB004	0.034	mg/kg	J	0.087C
	K164SB029	0.032		J	
	K164SB031	0.035		J	
Benzo(b)fluoranthene	K164SB004	0.034	mg/kg	J	0.87C
	K164SB029	0.039		J	
	K164SB031	0.046		J	
Benzo(g,h,i)perylene	K164SB004	0.028	mg/kg	J	160
	K164SB031	0.048		J	
	K164SB032	0.039		J	
Benzo(k)fluoranthene	K164SB004	0.035	mg/kg	J	8.7C
	K164SB029	0.033		J	
	K164SB031	0.038		J	
bis(2-Ethylhexyl) phthalate	K164SB031	0.067	mg/kg	J	46C
	K164SB032	0.051		J	
	K164SB033	0.022		J	
Chrysene	K164SB004	0.046	mg/kg	J	87C
	K164SB029	0.068		J	
	K164SB031	0.051		J	
	K164SB032	0 027		J	
Diethyl phthalate	K164SB028	0.061	mg/kg	J	6,300
Di-n-butyl phthalate	K164SB004	0.096	mg/kg	J	NL
Fluoranthene	K164SB004	0.061	mg/kg	J	310
	K164SB029	0.047		J	
	K164SB031	0 068		J	
	K164SB032	0.034		J	
	K164SB033	0.024		J	
Indeno(1,2,3-c,d)pyrene	K164SB004	0.033	mg/kg	J	0.87C
Phenanthrene	K164SB031	0.031	mg/kg	J	160
Pyrene	K164SB004	0 054	mg/kg	J	230
	K164SB029	0.058		J	
	K164SB033	0.028		J	

TABLE 3-4
Additional Surface Soil Organic Analytical Results--Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Region III Residential Soil RBC[a] (HI=0.1)
BEQ	K164SB004	**0.225**	mg/kg	0.088[b]	
	K164SB029	**0.232**			
	K164SB031	**0.252**			
	K164SB032	**0.404**			

Concentrations in bolded and outlined text exceed the RBCs or the zone background screening criteria.

[a] Non-carcinogen-residential RBCs (HI = 0.1) were obtained from the EPA Region III, RBC Table, October 5, 2000 (http://www.epa.gov/epahome/search.html).

[b] *Preliminary Results for Additional Background PAH Sampling from CNC Main Base Railroad Lines and Annex (Zone K)*. May 3, 2001. CH2M-Jones.

C Carcinogen-residential RBC was used directly from the EPA Region III, RBC Table, October 5, 2000.

= indicates that the chemical is detected at the concentration shown.

J indicates that the chemical is detected at a concentration below the method detection limit; the concentration is not known.

NA not applicable/not available/not analyzed
NL not listed
BEQ benzo(a)pyrene equivalent
HI hazard index
PAH polycylic aromatic hydrocarbon
RBC risk-based concentration
ThQ target hazard quotient

BEQ Calculation Procedure:

Equation 1: BEQ = Sum {PAH * TEF}

PAH = the concentration value to the seven target parameters (TP) listed below, or if there was no detection of the TP, half the TP detention limit is used.

TEF = Toxicity equivalency factor (TEF) listed below, relative to benzo(a)pyrene.

If there were no detection of all seven TP, then the BEQ = nondetect (ND).

Target Parameters	TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.001
Dibenz(a,h)anthracene	1
Indeno(1,2,3-c,d)pyrene	0.1

TABLE 3-5
Additional Subsurface Soil Organic Analytical Results—Detections Only
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration	Units	Qualifier	Soil-to-Groundwater SSL[a] DAF=10
Benzo(g,h,i)perylene	K164SB030	0.036	mg/kg	J	57,000[b]
bis(2-Ethylhexyl) phthalate	K164SB033	0.024	mg/kg	J	1,800

[a] Generic soil-to-groundwater SSLs (DAF = 10), *EPA Soil Screening Guidance: Technical Background Document* (Table A-1), EPA/540/R-95/128, May 1996, unless otherwise noted.

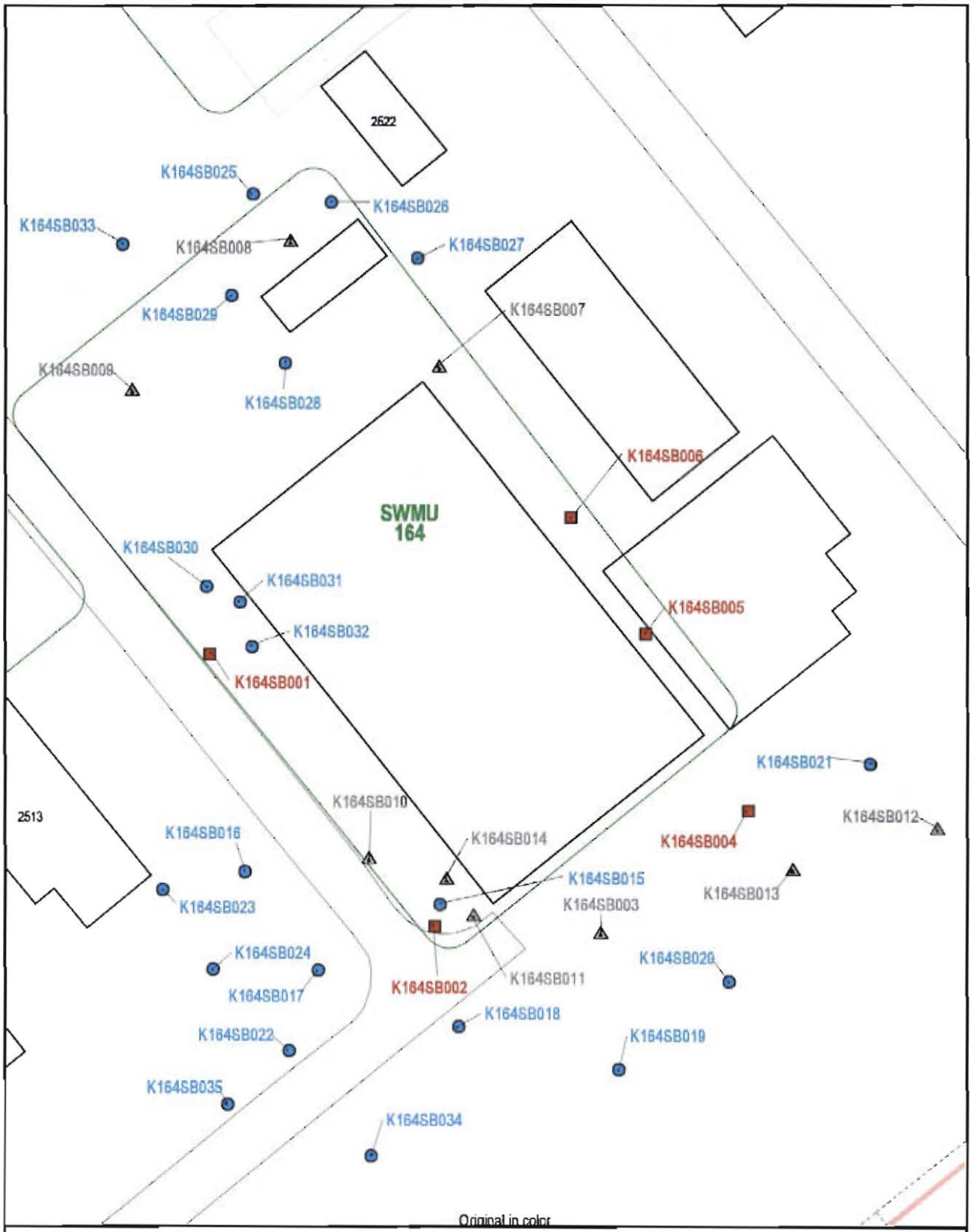
[b] EnSafe site specific soil-to-groundwater SSLs, *EPA Soil Screening Guidance: Technical Background Document*, EPA/540/R-95/128, May 1996, SSL calculation methods were used to derive the SSLs.

= indicates that the chemical is detected at the concentration shown.

J that the chemical is detected at a concentration below the method detection limit; the concentration is not known.

DAF dilution attenuation factor
SSL soil screening level
BEQ benzo(a)pyrene equivalent

Note: No BEQs were detected.



Soil Boring Locations
- Original RFI Borings
- Additional Borings
- Original RFI + Additional Borings
- Fence
- Roads
- Pavement

- Buildings
- Zone Boundary
- AOC Boundary
- SWMU Boundary

N

0 30 60 Feet

Figure 3-1
Additional Soil Boring Locations
SWMU 164, Zone K
Charleston Naval Complex

CH2MHILL

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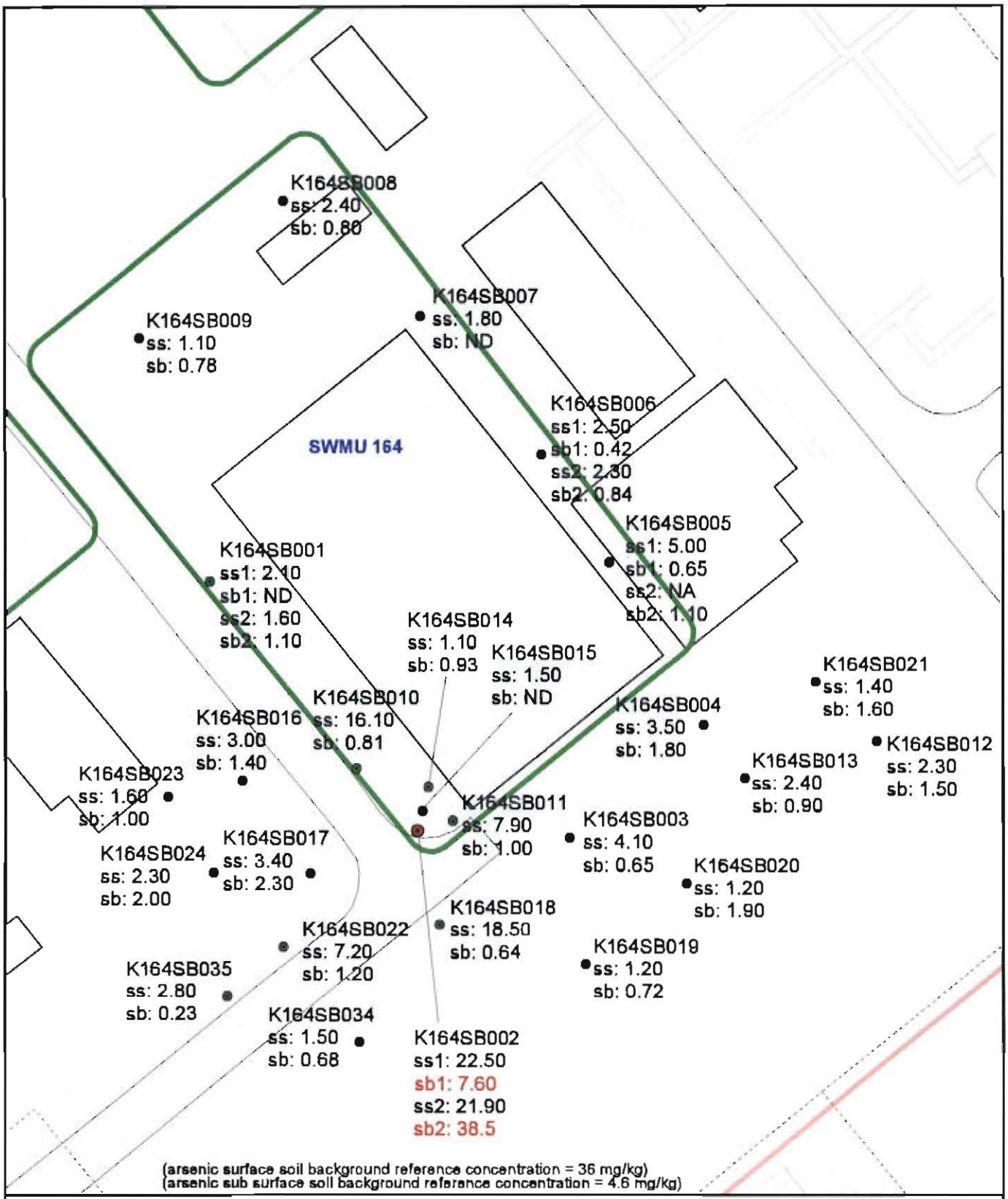

Figure 3-2
Arsenic Results
SWMU 164 - Zone K
Charleston Naval Complex

CH2MHILL

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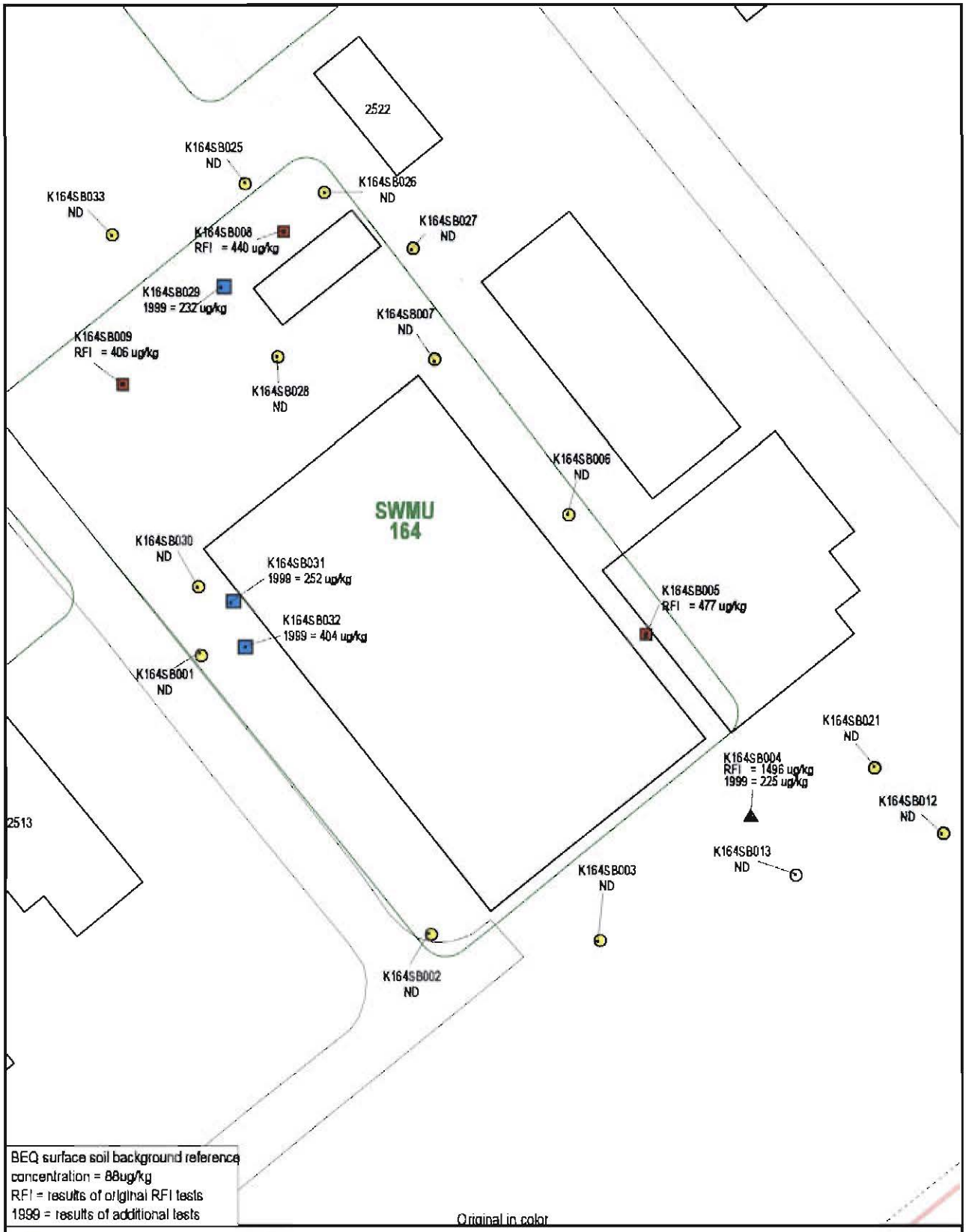

ND = Non-Detect
RFI tests
1999 tests
RFI and 1999 tests
SWMU Boundary
Buildings
Zone Boundary
Fence
Roads
Pavement
AOC Boundary

N

0 40 80 Feet

Figure 3-3
BEQ Results in Surface Soil
SWMU 164, Zone K
Charleston Naval Complex

CH2MHILL

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SECTION 4.0

COPC/COC Refinement

4.0 COPC/COC Refinement

Based on the RFI results (see Section 2.0 of this addendum) and the additional sampling and testing conducted after completion of the RFI Report (EnSafe, 1999a) (see Section 3.0), aluminum, arsenic, thallium, and BEQs were identified as exceeding soil screening criteria in at least one location. These parameters are further evaluated in the following sections to assess whether they are COCs. New tables are provided where noted to show data from the RFI and additional data combined for each respective parameter.

4.1 Surface Soil

4.1.1 Arsenic

As presented in Section 2.0 of this addendum, arsenic was identified as a surface soil COPC in the HHRA. Six surface soil samples exceeded the BRC of 3 parts per million (ppm) (see Figure 3-2). One location (K164SB002: 22.5 mg/kg) was sampled again in 1999 and reported a similar concentration (21.9 mg/kg). All six results, however, fall within the more recent background range of 0.6 mg/kg to 92 mg/kg. This range is based upon recent arsenic background sampling results, which are discussed in Section 3.0 of this RFI addendum.

No source areas of arsenic in soil were found at the site. The arsenic concentrations closest to Building 2556 are generally less than or equal to 5 mg/kg. These data suggest that significant releases of arsenic from SWMU 164 have not occurred. Based on these considerations arsenic is not considered a COC at this site.

4.1.2 BEQs

Four tested locations in the RFI report exceeded the RBC for BEQs (K164SB004, K164SB005, K164SB008, and K164SB009) (see Table 4-1 and Figure 3-3). Sample K164SB004 was re-sampled and tested in 1999, and was found to have lower BEQ concentrations than were found during the RFI investigation. Three new locations (K164SB029, K164SB031, and K164SB032), which were sampled in 1999, also had BEQ results above RBCs. However, all the reported positive detections for the individual PAH constituents (7 carcinogenic PAHs) were well below their respective RBC values (see Table 3-4). The individual sample-specific concentration for the three samples with more than one PAH reported in each sample are K164SB004-BEQ 0.045 mg/kg (detects only), K164SB029 –BEQ 0.039 mg/kg, (detects only), and K164SB031-BEQ 0.043 mg/kg (detects only). K164SB032 presented detection of

chrysene only, and the BEQ value estimated using only the detected chemicals is 0.00003 mg/kg. When non-detects were included in BEQ estimations at half the detection limit value reported, the total BEQ value exceeded the RBC value in the four surface soil samples (see Table 3-4). Thus, the exceedance is due to the contribution of the non-detected values to the BEQ value. Overall, BEQs that were reported were well below the reporting limit values, and were thus qualified with a 'J' flag. They are likely from anthropogenic sources, and not associated with site-specific activities. If Figures 2-1 and 3-3 are compared, the location of BEQs corresponds with proximity to pavement to the north of Building 2556, and to roof runoff on each side of the building. All areas receive runoff from paved parking areas. These locations are away from and unrelated to historic facility activities. None of the soil samples detected PAH results exceeding screening criteria in the soil. No source areas of BEQs in soil were identified and no spills or releases of BEQ-containing materials are documented at this site. Based on this consideration, BEQs are no longer considered COCs at SWMU 164.

4.2 Subsurface Soil

4.2.1 Aluminum

As presented in Section 3.0, the aluminum concentrations in two subsurface sample locations (K164SB016: 12,600 mg/kg and K164SB023: 12,200 mg/kg) exceeded the subsurface soil BRC of 10,500 mg/kg (see Table 4-2). These two aluminum concentrations only marginally exceeded the BRC and were within the Zone K, CNC Annex subsurface background reference concentration range for aluminum (3,090 mg/kg to 14,200 mg/kg). Because aluminum concentrations are within the practical range of background values for Zone K, CNC Annex, they do not warrant further investigation or action at SWMU 164.

4.2.2 Arsenic

Sample K164SB002 subsurface arsenic concentration (38.5 mg/kg) falls outside the Zone K, CNC Annex arsenic subsurface soil background sample range (0.6 to 6 mg/kg) (see background discussion in Section 3.3 and Figure 3-2). Arsenic background samples (GDKSB1601—surface soil and GDKSB1602—subsurface soil) that were collected recently from the same location presented 55.2 mg/kg in the surface soil sample and 0.57 mg/kg in the subsurface soil sample. This is indicative of the lack of leachability of the residual soil concentrations to the subsurface soil. Thus arsenic does not appear to be leaching. The downgradient well (130 feet from SMWU 164, see Appendix C), KGDKGW002, had no arsenic in the five sampling events conducted to date. While arsenic appears to be elevated at one soil sample location within SWMU 164, the site average concentration is below the

SSL, and groundwater in the area is not affected by arsenic (see additional groundwater discussion in Section 4.3 of this addendum). Thus, arsenic in subsurface soil does not warrant further investigation or action at SWMU 164.

4.2.3 Thallium

Thallium was not analyzed for in the *Zone K RFI Report, Revision 0* (EnSafe, 1999a). In 1999, thallium was reported in five of the 15 subsurface soil samples analyzed for this parameter. These five subsurface samples reported thallium concentrations slightly above the instrument detection limit range of 0.3 to 0.4 mg/kg; however, these results were well below the typical reporting limit of 2 mg/kg. They were therefore all 'J'-qualified data. Four of these subsurface soil samples were also analyzed by SPLP method to assess potential leachability from soil. None of the four leachate samples had detectable thallium (see Appendix A). Thus, though reported thallium 'J'-qualified data were above the SSL (DAF = 10) concentration (0.35 mg/kg), it is not leaching from the soil. It is likely natural to the soil in the area. No elevated detections of thallium were found in surface soil samples, which supports the conclusion that these subsurface thallium concentrations are not related to a release of contamination at this site.

No Zone K, CNC Annex BRC is available for thallium because no background samples collected from Zone K, CNC Annex detected thallium. Since a background reference value for Zone K, CNC Annex is not available, the main base background reference values are provided for comparison. The overall background reference concentrations for the CNC range from 0.36 mg/kg to 1.9 mg/kg, and SWMU 164 concentrations are well within this range. Because thallium at the site is not elevated and all detected concentrations are low, or near detection limits, it indicates there is no site-related source. Thus, thallium in subsurface soil does not warrant further investigation or action at SWMU 164.

4.3 Groundwater

No groundwater wells were installed at SWMU 164. However, there are several nearby wells. A potentiometric map showing location of wells, groundwater elevation contours, and groundwater flow direction is provided as Appendix C. The interpreted groundwater flow direction at SWMU 164 is from northwest to southeast. There were no contaminants detected above screening levels in six groundwater sampling events collected from grid well KGDKGW002, which is located approximately 130 feet downgradient of SWMU 164. Five rounds were sampled for metals, four for pesticides/PCBs and SVOCs, three for VOCs, and one for gasoline/diesel.

In addition, there were no VOCs detected in the groundwater samples collected from the shallow portion of the surficial aquifer at the direct-push technology (DPT) points 166GP018 and 166GP072, which are located approximately 50 feet sidegradient of building 2556 and 110 feet downgradient of the SAA on the SWMU 164 site, respectively. A figure showing these locations is presented as Appendix D. Metals were not detected above their respective maximum contaminant level (MCL) in the filtered sample from 166GP018. Chlorinated solvents were not detected above the method detection limit in the groundwater sample collected from the deep monitor well, 166GW22D, which is located 25 feet west of building 2556 in SWMU 164.

Based on the results of the soil sampling and testing, no chemicals were found in soil at concentrations that would indicate a potential soil-to-groundwater pathway. Exceedances of SSLs in the subsurface were limited to one isolated arsenic detection and a few low-level thallium detections, as explained above. Overall site statistical averages for arsenic and thallium appear to be within background reference levels. Collocated background arsenic samples with higher surface soil concentrations did not have significant subsurface soil levels in the latest samples, indicating that leaching is currently not occurring. Regional groundwater did not have elevated metals in any of the wells, including a grid-based sample well located immediately downgradient of SWMU 164. Thus, groundwater does not warrant additional specific investigation or action at SWMU 164.

TABLE 4-1
Surface Soil Analytical Results for Parameters Exceeding Screening Criteria
RFI Addendum, SWMU 164, Zone K, CNC Annex, Charleston Naval Complex

Parameter	Location	Concentration RFI	Concentration 1999	Units	Region III Residential Soil RBC[a] (HI=0.1)	Surface Background Reference Concentration
BEQ	K164SB004	1496	225	µg/kg	87[b]	88[c]
	K164SB005	477				
	K164SB008	440				
	K164SB009	406				
	K164SB029		232			
	K164SB031		252			
	K164SB032		404			

[a] Residential RBCs (HI=0.1 for noncarcinogens) were obtained from the EPA Region III RBC Table, October 5, 2000 (http://www.epa.gov/eaphome/search.html), unless otherwise noted.

[b] Residential RBC for benzo(a)pyrene in the reference cited in footnote a above.

[c] *Preliminary Results for Additional Background PAH Sampling from CNC Main Base Railroad Lines and Annex (Zone K)*. May 3, 2001. CH2M-Jones.

= indicates that the chemical is detected at the concentration shown.

HI hazard index

RBC risk-based concentration

See Table 3-4 for BEQ calculation procedure.

Note: All background values for Zone K-Annex are based on twice the mean of the sample concentrations, as described in the *Zone K RFI Report*, Section 5 – Data Evaluation and Background Comparison. Also, see footnote c above.

TABLE 4-2
Subsurface Soil Analytical Results for Parameters Exceeding Screening Criteria
RFI Addendum, SWMU 164, Zone K-Annex, Charleston Naval Complex

Parameter	Location	Concentration RFI	Concentration 1999	Units	Qualifier	Soil to Groundwater SSL[a] (DAF=10)	Surface Background Reference Concentration
Aluminum	K164SB016		12,600	mg/kg	=	NL	10,500
	K164SB023		12,200		=		
Arsenic	K164SB002		38.5	mg/kg	=	14.5	4.6[b]
Thallium	K164SB021		0.5	mg/kg	=	0.35	NA
	K164SB022		0.46		=		
	K164SB023		0.52		=		
	K164SB024		0.44		=		
	K164SB034		0.57		=		

[a] Generic soil-to-groundwater SSLs (DAF = 10) from *EPA Soil Screening Guidance: Technical Background Document* (Table A-1), EPA/540/R-95/128, May 1996, unless otherwise noted.

[b] *Preliminary Results for Additional Background PAH Sampling from CNC Main Base Railroad Lines and Annex (Zone K)*, May 3, 2001, CH2M-Jones.

= indicates that the chemical is detected at the concentration shown.

DAF dilution attenuation factor

NA not applicable/not available/not analyzed

NL not listed

SSL soil screening level

Note: All background values for Zone K-Annex are based on twice the mean of the sample concentrations, as described in the *Zone K RFI Report*, Section 5 – Data Evaluation and Background Comparison. Also, see footnote b above.

SECTION 5.0

Summary of Additional Information Related to Site Closeout Issues

5.0 Summary of Information Related to Site Closeout Issues

5.1 RFI Status

The *Zone K RFI Report* (EnSafe, 1999a) addressed SWMUs/AOCs within the Naval Annex, including SWMU 164. At the conclusion of the RFI report, EnSafe did not consider the investigation to be complete for this site, and their subsequent *Final Zone K RFI Report Work Plan Addendum* (EnSafe, 1999b) proposed additional sampling. As presented and discussed in Section 3.0 of this RFI addendum, the results of the additional testing confirm that the previous COCs (BEQs and arsenic) identified in the RFI are no longer contaminants of concern. The CH2M-Jones *Zone K RFI Report Work Plan Addendum* (2000) and the Zone K, CNC Annex Scoping Meeting held on September 6, 2000, both concluded that no additional samples would be collected at SWMU 164. These data and the responses to SCDHEC comments confirm that additional soil or groundwater samples are not required and that NFA is appropriate for this site. A copy of the responses to SCDHEC comments on the *Zone K RFI Report* and *Final Zone K RFI Work Plan Addendum* for this site are provided as Appendix E.

The former fuel oil AST at Building 2556 was removed in a closure action documented by a letter from the State of South Carolina dated October 27, 1999. This letter also documents NFA for the AST removal at this site.

In accordance with the RFI completion process, if a determination of No Further Investigation (NFI) is made upon completion of the RFI, then a site may proceed to either NFA status or to a corrective measures study (CMS). Because no chemical detections at this site exceeded risk-based criteria and background reference concentrations, CH2M-Jones recommends this site for NFA.

5.2 Presence of Inorganics in Groundwater

For the purpose of site closeout documentation, the inorganics in groundwater issue refers to the occasional or intermittent detection of several metals (primarily arsenic, thallium, and antimony) in groundwater at concentrations above the applicable MCL, preceded or

followed by detections of these same metals below the MCL or below the practicable quantitation limit.

The RFI determined that the soil-to-groundwater pathway is not significant. The subsequent investigation detected minor SSL exceedances of arsenic and thallium in site soils as discussed in Section 3.0, but these are within the background range and do not represent source areas. In five groundwater sampling events and inorganic analyses collected from grid well KGDKGW002, which is located approximately 130 feet downgradient of SWMU 164, nothing was detected above screening levels. As a result, the soil-to-groundwater pathway is considered invalid at this site, and a groundwater investigation is not warranted.

5.3 Potential Linkage to SWMU 37, Investigated Sanitary Sewers at the CNC

Because of the location of this site at the Naval Annex, there is no potential linkage to SWMU 37, which is located at the Charleston Naval Shipyard. Furthermore, there are no COCs that could migrate from the site.

5.4 Potential Linkage to AOC 699, Investigated Storm Sewers at the CNC

Because of the location of this site at the Naval Annex, no linkage to AOC 699, the storm sewer at the Charleston Naval Shipyard, is possible. In addition, because there were no COCs identified in groundwater or soil, COC migration is not a concern at this site.

5.5 Potential Linkage to AOC 504, Investigated Railroad Lines at the CNC

No railroad lines are present at the Naval Annex, so further evaluation of a potential linkage between AOC 504 and the subject site is not necessary.

5.6 Potential Migration Pathways to Surface Water Bodies at the CNC

The nearest named surface water body to SWMU 164 is Filbin Creek, which is located more than 3,000 feet to the southeast.

Two potential migration pathways from the site to surface water are overland flow via storm water runoff, and subsurface flow via groundwater. Due to the fact that the additional investigation found no significant exceedances in soils in the site ditches, and that the nearest water-receiving body is 3,000 feet to the southeast, surface water runoff from SWMU 164 would not be an ecological concern at Filbin Creek. Thus, further evaluation of a potential pathway for contaminant migration via stormwater runoff is not warranted.

There were no chemicals found in soil at SWMU 164 at concentrations that would indicate a potential soil-to-groundwater pathway. Therefore, further evaluation of the potential migration of contaminated groundwater to a surface water body is not warranted.

5.7 Potential Contamination in OWSs

The issue of potential contamination of OWSs refers to the possible presence of an OWS that has not yet been investigated at a SWMU or AOC as part of the RCRA or underground storage tank (UST) process.

Neither the RCRA Facility Assessment (RFA) nor the RFI refer to the presence or possible presence of an OWS at SWMU 164. In addition, there is no visual evidence of an OWS at this site. Therefore, further evaluation of this issue at SWMU 164 is not warranted.

In addition, there is no reference made in the basewide OWS report prepared by the Navy in Y2000 to an OWS at this facility.

5.8 Land Use Control Management Plan

No COCs were identified in any media at SWMU 164. The *Charleston Naval Annex Reuse Plan* (Wilbur Smith Associates, 1997) indicated that light industrial distribution/mixed uses are planned for this site. Thus, land use controls are not necessary at SWMU 164.

SECTION 6.0

Recommendations

6.0 Recommendations

SWMU 164 consists of a former abrasive blasting booth located in Building 2556 at the Naval Annex. Built in 1983, the building housed sand blasting, paint, and drying booths, and was also used for mine storage. When the concrete floor in the building was inspected on March 9, 1999, it was in good condition and no cracks were observed. A fuel oil AST was located outside and adjacent to the northwest corner of the building, but has since been clean-closed by the Navy. There have been no reports or observations indicating any past spills or contaminants that may have been released from this unit.

According to the additional information obtained after the RFI report, no organics except BEQs were detected above screening levels in soil. Inorganic exceedances were limited to aluminum, arsenic, and thallium. Aluminum concentrations did not exceed the practical range of background reference concentrations for Zone K, CNC Annex. Overall arsenic in surface soil is within background levels at SMWU 164, and arsenic was not detected in groundwater. As thallium at the site is not significantly elevated and all detected concentrations are low (near detection limits) it indicates there is no site-related source. Thus, the presence of inorganics in soil does not warrant further investigation or action at SWMU 164. There were no contaminants detected above screening levels in six groundwater sampling events collected from grid well KGDKGW002, which is located approximately 130 feet downgradient of SWMU 164. No chemicals were found in soil at concentrations that would indicate a potential soil-to-groundwater pathway. Thus, groundwater does not warrant further investigation or action at SWMU 164.

Once the BCT concurs that NFA is appropriate for the site, a Statement of Basis will be prepared that will be made available for public comment in accordance with SCDHEC policy. This will allow for public participation in the final remedy selection.

SECTION 7.0

References

7.0 References

CH2M-Jones. *Zone K RFI Report Work Plan Addendum, Zone K Naval Station Annex, NAVBASE, Charleston.* September 2000.

EnSafe Inc. *Zone K RFI Report, NAVBASE Charleston.* Revision 0. June 11, 1999a.

EnSafe Inc. *Final Zone K RFI Report Work Plan Addendum, NAVBASE Charleston.* November 16, 1999b.

U.S. Environmental Protection Agency. *RCRA Corrective Action Plan.* OSWER Directive 9902.3-2A. May 1994.

U.S. Environmental Protection Agency. *EPA Soil Screening Guidance: Technical Background Document* (Table A-1), EPA/540/R-95/128. May 1996.

Wilbur Smith Associates. *Charleston Naval Annex Reuse Plan.* Charleston, S.C. February 1997.

APPENDIX A

Analytical Data from the EnSafe RFI Investigation (1999)

	StationID	K164SB004		K164SB004		K164SB021		K164SB021		K164SB025	
	SampleID	164SB004T1 (0-1ft)		164SB004T2 (3-5ft)		164SB02101 (0-1ft)		164SB02102 (3-5ft)		164SB02501 (0-1ft)	
	DateCollected	10/12/1999		10/12/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	10/15/1999		10/19/1999		12/02/1999		12/02/1999		12/03/1999	
	SDGNumber	NBCK01		NBCK01		NBCK07		NBCK07		NBCK08	
Parameter	**Units**										
2,2'-OXYBIS(1-CHLORO)PROPANE	UG/KG	360	U	380	U	400	U	390	U	360	U
2-METHYLNAPHTHALENE	UG/KG	360	U	380	U	400	U	390	U	360	U
2-METHYLPHENOL (o-CRESOL)	UG/KG	360	U	380	U	400	U	390	U	360	U
3-Methylphenol (m-Cresol)	UG/KG	360	U	380	U	400	U	390	U	360	U
Benzidine	UG/KG	2900	U	3100	U						
Diphenylamine	UG/KG	360	U	380	U	400	U	390	U	360	U
N-Nitrosodimethylamine	UG/KG	360	U	380	U	400	U	390	U	360	U
PHENOL	UG/KG	360	U	380	U	400	U	390	U	360	U
ACENAPHTHYLENE	UG/KG	360	U	380	U	400	U	390	U	360	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	UG/KG	360	U	380	U	400	U	390	U	360	U
2-CHLOROPHENOL	UG/KG	360	U	380	U	400	U	390	U	360	U
ACENAPHTHENE	UG/KG	360	U	380	U	400	U	390	U	360	U
1,3-DICHLOROBENZENE	UG/KG	360	U	380	U	400	U	390	U	360	U
FLUORENE	UG/KG	360	U	380	U	400	U	390	U	360	U
1,4-DICHLOROBENZENE	UG/KG	360	U	380	U	400	U	390	U	360	U
PHENANTHRENE	UG/KG	360	U	380	U	400	U	390	U	360	U
ANTHRACENE	UG/KG	360	U	380	U	400	U	390	U	360	U
Benzyl alcohol	UG/KG	360	U	380	U	400	U	390	U	360	U
FLUORANTHENE	UG/KG	61	J	380	U	400	U	390	U	360	U
1,2-DICHLOROBENZENE	UG/KG	360	U	380	U	400	U	390	U	360	U
PYRENE	UG/KG	54	J	380	U	400	U	390	U	360	U
BENZO(a)ANTHRACENE	UG/KG	39	J	380	U	400	U	390	U	360	U
CHRYSENE	UG/KG	46	J	380	U	400	U	390	U	360	U
BENZO(b)FLUORANTHENE	UG/KG	34	J	380	U	400	U	390	U	360	U
N-NITROSODI-n-PROPYLAMINE	UG/KG	360	U	380	U	400	U	390	U	360	U
4-METHYLPHENOL (p-CRESOL)	UG/KG										
BENZO(k)FLUORANTHENE	UG/KG	35	J	380	U	400	U	390	U	360	U
BENZO(a)PYRENE	UG/KG	34	J	380	U	400	U	390	U	360	U
HEXACHLOROETHANE	UG/KG	360	U	380	U	400	U	390	U	360	U
INDENO(1,2,3-c,d)PYRENE	UG/KG	33	J	380	U	400	U	390	U	360	U
NITROBENZENE	UG/KG	360	U	380	U	400	U	390	U	360	U
DIBENZ(a,h)ANTHRACENE	UG/KG	360	U	380	U	400	U	390	U	360	U
ISOPHORONE	UG/KG	360	U	380	U	400	U	390	U	360	U
2-NITROPHENOL	UG/KG	360	U	380	U	400	U	390	U	360	U
BENZO(g,h,i)PERYLENE	UG/KG	28	J	380	U	400	U	390	U	360	U

	StationID	K164SB025		K164SB026		K164SB026		K164SB027		K164SB027	
	SampleID	164SB02502 (3-5ft)		164SB02601 (0-1ft)		164SB02602 (3-5ft)		164SB02701 (0-1ft)		164SB02702 (3-5ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	12/03/1999		12/03/1999		12/03/1999		12/03/1999		12/03/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08		NBCK08	
Parameter	**Units**										
2,2'-OXYBIS(1-CHLORO)PROPANE	UG/KG	360	U	360	U	360	U	360	U	370	U
2-METHYLNAPHTHALENE	UG/KG	360	U	360	U	360	U	360	U	370	U
2-METHYLPHENOL (o-CRESOL)	UG/KG	360	U	360	U	360	U	360	U	370	U
3-Methylphenol (m-Cresol)	UG/KG	360	U	360	U	360	U	360	U	370	U
Benzidine	UG/KG										
Diphenylamine	UG/KG	360	U	360	U	360	U	360	U	370	U
N-Nitrosodimethylamine	UG/KG	360	U	360	U	360	U	360	U	370	U
PHENOL	UG/KG	360	U	360	U	360	U	360	U	370	U
ACENAPHTHYLENE	UG/KG	360	U	360	U	360	U	360	U	370	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	UG/KG	360	U	360	U	360	U	360	U	370	U
2-CHLOROPHENOL	UG/KG	360	U	360	U	360	U	360	U	370	U
ACENAPHTHENE	UG/KG	360	U	360	U	360	U	360	U	370	U
1,3-DICHLOROBENZENE	UG/KG	360	U	360	U	360	U	360	U	370	U
FLUORENE	UG/KG	360	U	360	U	360	U	360	U	370	U
1,4-DICHLOROBENZENE	UG/KG	360	U	360	U	360	U	360	U	370	U
PHENANTHRENE	UG/KG	360	U	360	U	360	U	360	U	370	U
ANTHRACENE	UG/KG	360	U	360	U	360	U	360	U	370	U
Benzyl alcohol	UG/KG	360	U	360	U	360	U	360	U	370	U
FLUORANTHENE	UG/KG	360	U	360	U	360	U	360	U	370	U
1,2-DICHLOROBENZENE	UG/KG	360	U	360	U	360	U	360	U	370	U
PYRENE	UG/KG	360	U	360	U	360	U	360	U	370	U
BENZO(a)ANTHRACENE	UG/KG	360	U	360	U	360	U	360	U	370	U
CHRYSENE	UG/KG	360	U	360	U	360	U	360	U	370	U
BENZO(b)FLUORANTHENE	UG/KG	360	U	360	U	360	U	360	U	370	U
N-NITROSODI-n-PROPYLAMINE	UG/KG	360	U	360	U	360	U	360	U	370	U
4-METHYLPHENOL (p-CRESOL)	UG/KG										
BENZO(k)FLUORANTHENE	UG/KG	360	U	360	U	360	U	360	U	370	U
BENZO(a)PYRENE	UG/KG	360	U	360	U	360	U	360	U	370	U
HEXACHLOROETHANE	UG/KG	360	U	360	U	360	U	360	U	370	U
INDENO(1,2,3-c,d)PYRENE	UG/KG	360	U	360	U	360	U	360	U	370	U
NITROBENZENE	UG/KG	360	U	360	U	360	U	360	U	370	U
DIBENZ(a,h)ANTHRACENE	UG/KG	360	U	360	U	360	U	360	U	370	U
ISOPHORONE	UG/KG	360	U	360	U	360	U	360	U	370	U
2-NITROPHENOL	UG/KG	360	U	360	U	360	U	360	U	370	U
BENZO(g,h,i)PERYLENE	UG/KG	360	U	360	U	360	U	360	U	370	U

	StationID	K164SB028		K164SB028		K164SB029		K164SB029		K164SB030	
	SampleID	164SB02801 (0-1ft)		164SB02802 (3-5ft)		164SB02901 (0-1ft)		164SB02902 (3-5ft)		164SB03001 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999		11/19/1999	
	DateAnalyzed	12/07/1999		12/03/1999		12/03/1999		12/03/1999		12/07/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08		NBCK09	
Parameter	Units										
2,2'-OXYBIS(1-CHLORO)PROPANE	UG/KG	370	U	360	U	350	U	370	U	350	U
2-METHYLNAPHTHALENE	UG/KG	370	U	360	U	350	U	370	U	350	U
2-METHYLPHENOL (o-CRESOL)	UG/KG	370	U	360	U	350	U	370	U	350	U
3-Methylphenol (m-Cresol)	UG/KG	370	U	360	U	350	U	370	U	350	U
Benzidine	UG/KG										
Diphenylamine	UG/KG	370	U	360	U	350	U	370	U	350	U
N-Nitrosodimethylamine	UG/KG	370	U	360	U	350	U	370	U	350	U
PHENOL	UG/KG	370	U	360	U	350	U	370	U	350	U
ACENAPHTHYLENE	UG/KG	370	U	360	U	350	U	370	U	350	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	UG/KG	370	U	360	U	350	U	370	U	350	U
2-CHLOROPHENOL	UG/KG	370	U	360	U	350	U	370	U	350	U
ACENAPHTHENE	UG/KG	370	U	360	U	350	U	370	U	350	U
1,3-DICHLOROBENZENE	UG/KG	370	U	360	U	350	U	370	U	350	U
FLUORENE	UG/KG	370	U	360	U	350	U	370	U	350	U
1,4-DICHLOROBENZENE	UG/KG	370	U	360	U	350	U	370	U	350	U
PHENANTHRENE	UG/KG	370	U	360	U	350	U	370	U	350	U
ANTHRACENE	UG/KG	370	U	360	U	350	U	370	U	350	U
Benzyl alcohol	UG/KG	370	U	360	U	350	U	370	U	350	U
FLUORANTHENE	UG/KG	370	U	360	U	47	J	370	U	350	U
1,2-DICHLOROBENZENE	UG/KG	370	U	360	U	350	U	370	U	350	U
PYRENE	UG/KG	370	U	360	U	58	J	370	U	350	U
BENZO(a)ANTHRACENE	UG/KG	370	U	360	U	31	J	370	U	350	U
CHRYSENE	UG/KG	370	U	360	U	68	J	370	U	350	U
BENZO(b)FLUORANTHENE	UG/KG	370	U	360	U	39	J	370	U	350	U
N-NITROSODI-n-PROPYLAMINE	UG/KG	370	U	360	U	350	U	370	U	350	U
4-METHYLPHENOL (p-CRESOL)	UG/KG										
BENZO(k)FLUORANTHENE	UG/KG	370	U	360	U	33	J	370	U	350	U
BENZO(a)PYRENE	UG/KG	370	U	360	U	32	J	370	U	350	U
HEXACHLOROETHANE	UG/KG	370	U	360	U	350	U	370	U	350	U
INDENO(1,2,3-c,d)PYRENE	UG/KG	370	U	360	U	350	U	370	U	350	U
NITROBENZENE	UG/KG	370	U	360	U	350	U	370	U	350	U
DIBENZ(a,h)ANTHRACENE	UG/KG	370	U	360	U	350	U	370	U	350	U
ISOPHORONE	UG/KG	370	U	360	U	350	U	370	U	350	U
2-NITROPHENOL	UG/KG	370	U	360	U	350	U	370	U	350	U
BENZO(g,h,i)PERYLENE	UG/KG	370	U	360	U	350	U	370	U	350	U

	StationID	K164SB030		K164SB031		K164SB031		K164SB032		K164SB032	
	SampleID	164SB03002 (3-5ft)		164SB03101 (0-1ft)		164SB03102 (3-5ft)		164SB03201 (0-1ft)		164SB03202 (3-5ft)	
	DateCollected	11/19/1999		11/19/1999		11/19/1999		11/19/1999		11/19/1999	
	DateAnalyzed	12/07/1999		12/07/1999		12/07/1999		12/07/1999		12/07/1999	
	SDGNumber	NBCK09		NBCK09		NBCK09		NBCK09		NBCK09	
Parameter	**Units**										
2,2'-OXYBIS(1-CHLORO)PROPANE	UG/KG	360	U	380	U	370	U	350	U	370	U
2-METHYLNAPHTHALENE	UG/KG	360	U	380	U	370	U	350	U	370	U
2-METHYLPHENOL (o-CRESOL)	UG/KG	360	U	380	U	370	U	350	U	370	U
3-Methylphenol (m-Cresol)	UG/KG	360	U	380	U	370	U	350	U	370	U
Benzidine	UG/KG										
Diphenylamine	UG/KG	360	U	380	U	370	U	350	U	370	U
N-Nitrosodimethylamine	UG/KG	360	U	380	U	370	U	350	U	370	U
PHENOL	UG/KG	360	U	380	U	370	U	350	U	370	U
ACENAPHTHYLENE	UG/KG	360	U	380	U	370	U	350	U	370	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	UG/KG	360	U	380	U	370	U	350	U	370	U
2-CHLOROPHENOL	UG/KG	360	U	380	U	370	U	350	U	370	U
ACENAPHTHENE	UG/KG	360	U	380	U	370	U	350	U	370	U
1,3-DICHLOROBENZENE	UG/KG	360	U	380	U	370	U	350	U	370	U
FLUORENE	UG/KG	360	U	380	U	370	U	350	U	370	U
1,4-DICHLOROBENZENE	UG/KG	360	U	380	U	370	U	350	U	370	U
PHENANTHRENE	UG/KG	360	U	31	J	370	U	350	U	370	U
ANTHRACENE	UG/KG	360	U	380	U	370	U	350	U	370	U
Benzyl alcohol	UG/KG	360	U	380	U	370	U	350	U	370	U
FLUORANTHENE	UG/KG	360	U	68	J	370	U	34	J	370	U
1,2-DICHLOROBENZENE	UG/KG	360	U	380	U	370	U	350	U	370	U
PYRENE	UG/KG	360	U	380	U	370	U	350	U	370	U
BENZO(a)ANTHRACENE	UG/KG	360	U	26	J	370	U	350	U	370	U
CHRYSENE	UG/KG	360	U	51	J	370	U	27	J	370	U
BENZO(b)FLUORANTHENE	UG/KG	360	U	46	J	370	U	350	U	370	U
N-NITROSODI-n-PROPYLAMINE	UG/KG	360	U	380	U	370	U	350	U	370	U
4-METHYLPHENOL (p-CRESOL)	UG/KG										
BENZO(k)FLUORANTHENE	UG/KG	360	U	38	J	370	U	350	U	370	U
BENZO(a)PYRENE	UG/KG	360	U	35	J	370	U	350	U	370	U
HEXACHLOROETHANE	UG/KG	360	U	380	U	370	U	350	U	370	U
INDENO(1,2,3-c,d)PYRENE	UG/KG	360	U	380	U	370	U	350	U	370	U
NITROBENZENE	UG/KG	360	U	380	U	370	U	350	U	370	U
DIBENZ(a,h)ANTHRACENE	UG/KG	360	U	380	U	370	U	350	U	370	U
ISOPHORONE	UG/KG	360	U	380	U	370	U	350	U	370	U
2-NITROPHENOL	UG/KG	360	U	380	U	370	U	350	U	370	U
BENZO(g,h,i)PERYLENE	UG/KG	36	J	48	J	370	U	39	J	370	U

	StationID	K164SB033		K164SB033	
	SampleID	164SB03301 (0-1ft)		164SB03302 (3-5ft)	
	DateCollected	12/22/1999		12/22/1999	
	DateAnalyzed	01/07/2000		01/07/2000	
	SDGNumber	41577		41577	
Parameter	Units				
2,2'-OXYBIS(1-CHLORO)PROPANE	UG/KG	430	U	380	U
2-METHYLNAPHTHALENE	UG/KG	430	U	380	U
2-METHYLPHENOL (o-CRESOL)	UG/KG	430	U	380	U
3-Methylphenol (m-Cresol)	UG/KG				
Benzidine	UG/KG				
Diphenylamine	UG/KG				
N-Nitrosodimethylamine	UG/KG				
PHENOL	UG/KG	430	U	380	U
ACENAPHTHYLENE	UG/KG	430	U	380	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	UG/KG	430	U	380	U
2-CHLOROPHENOL	UG/KG	430	U	380	U
ACENAPHTHENE	UG/KG	430	U	380	U
1,3-DICHLOROBENZENE	UG/KG	430	U	380	U
FLUORENE	UG/KG	430	U	380	U
1,4-DICHLOROBENZENE	UG/KG	430	U	380	U
PHENANTHRENE	UG/KG	430	U	380	U
ANTHRACENE	UG/KG	430	U	380	U
Benzyl alcohol	UG/KG	430	U	380	U
FLUORANTHENE	UG/KG	24	J	380	U
1,2-DICHLOROBENZENE	UG/KG	430	U	380	U
PYRENE	UG/KG	28	J	380	U
BENZO(a)ANTHRACENE	UG/KG	430	U	380	U
CHRYSENE	UG/KG	430	U	380	U
BENZO(b)FLUORANTHENE	UG/KG	430	U	380	U
N-NITROSODI-n-PROPYLAMINE	UG/KG	430	U	380	U
4-METHYLPHENOL (p-CRESOL)	UG/KG	430	U	380	U
BENZO(k)FLUORANTHENE	UG/KG	430	U	380	U
BENZO(a)PYRENE	UG/KG	430	U	380	U
HEXACHLOROETHANE	UG/KG	430	U	380	U
INDENO(1,2,3-c,d)PYRENE	UG/KG	430	U	380	U
NITROBENZENE	UG/KG	430	U	380	U
DIBENZ(a,h)ANTHRACENE	UG/KG	430	U	380	U
ISOPHORONE	UG/KG	430	U	380	U
2-NITROPHENOL	UG/KG	430	U	380	U
BENZO(g,h,i)PERYLENE	UG/KG	430	U	380	U

	StationID	K164SB004		K164SB004		K164SB021		K164SB021		K164SB025	
	SampleID	164SB004T1 (0-1ft)		164SB004T2 (3-5ft)		164SB02101 (0-1ft)		164SB02102 (3-5ft)		164SB02501 (0-1ft)	
	DateCollected	10/12/1999		10/12/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	10/15/1999		10/19/1999		12/02/1999		12/02/1999		12/03/1999	
	SDGNumber	NBCK01		NBCK01		NBCK07		NBCK07		NBCK08	
Parameter	**Units**										
2,4-DIMETHYLPHENOL	UG/KG	360	U	380	U	400	U	390	U	360	U
bis(2-CHLOROETHOXY) METHANE	UG/KG	360	U	380	U	400	U	390	U	360	U
Benzoic acid	UG/KG	1800	U	2000	U	2000	U	2000	U	1800	U
2,4-DICHLOROPHENOL	UG/KG	360	U	380	U	400	U	390	U	360	U
1,2,4-TRICHLOROBENZENE	UG/KG	360	U	380	U	400	U	390	U	360	U
4-CHLOROANILINE	UG/KG	710	U	760	U	790	U	770	U	720	U
HEXACHLOROBUTADIENE	UG/KG	360	U	380	U	400	U	390	U	360	U
4-CHLORO-3-METHYLPHENOL	UG/KG	360	U	380	U	400	U	390	U	360	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	360	U	380	U	400	U	390	U	360	U
2,4,6-TRICHLOROPHENOL	UG/KG	360	U	380	U	400	U	390	U	360	U
2,4,5-TRICHLOROPHENOL	UG/KG	360	U	380	U	400	U	390	U	360	U
2-CHLORONAPHTHALENE	UG/KG	360	U	380	U	400	U	390	U	360	U
2-NITROANILINE	UG/KG	1800	U	2000	U	2000	U	2000	U	1800	U
2,6-DINITROTOLUENE	UG/KG	360	U	380	U	400	U	390	U	360	U
3-NITROANILINE	UG/KG	1800	U	2000	U	2000	U	2000	U	1800	U
2,4-DINITROPHENOL	UG/KG	1800	U	2000	UJ	2000	U	2000	U	1800	U
DIBENZOFURAN	UG/KG	360	U	380	U	400	U	390	U	360	U
4-NITROPHENOL	UG/KG	1800	U	2000	U	2000	U	2000	U	1800	U
2,4-DINITROTOLUENE	UG/KG	360	U	380	U	400	U	390	U	360	U
DIMETHYL PHTHALATE	UG/KG	360	U	380	U	400	U	390	U	360	U
DIETHYL PHTHALATE	UG/KG	360	U	380	U	400	U	390	U	360	U
4-CHLOROPHENYL PHENYL ETHER	UG/KG	360	U	380	U	400	U	390	U	360	U
4-NITROANILINE	UG/KG	1800	U	2000	U	2000	U	2000	U	1800	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1800	U	2000	U	2000	U	2000	U	1800	U
N-NITROSODIPHENYLAMINE	UG/KG										
4-BROMOPHENYL PHENYL ETHER	UG/KG	360	U	380	U	400	U	390	U	360	U
HEXACHLOROBENZENE	UG/KG	360	U	380	U	400	U	390	U	360	U
PENTACHLOROPHENOL	UG/KG	1800	U	2000	U	2000	U	2000	U	1800	U
DI-n-BUTYL PHTHALATE	UG/KG	96	J	380	U	400	U	390	U	360	U
BENZYL BUTYL PHTHALATE	UG/KG	360	U	380	U	400	U	390	U	360	U
3,3'-DICHLOROBENZIDINE	UG/KG	710	U	760	U	790	U	770	U	720	U
bis(2-ETHYLHEXYL) PHTHALATE	UG/KG	360	U	380	U	400	U	390	U	360	U
DI-n-OCTYLPHTHALATE	UG/KG	360	U	380	U	400	U	390	U	360	U

	StationID	K164SB025		K164SB026		K164SB026		K164SB027		K164SB027	
	SampleID	164SB02502 (3-5ft)		164SB02601 (0-1ft)		164SB02602 (3-5ft)		164SB02701 (0-1ft)		164SB02702 (3-5ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	12/03/1999		12/03/1999		12/03/1999		12/03/1999		12/03/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08		NBCK08	
Parameter	**Units**										
2,4-DIMETHYLPHENOL	UG/KG	360	U	360	U	360	U	360	U	370	U
bis(2-CHLOROETHOXY) METHANE	UG/KG	360	U	360	U	360	U	360	U	370	U
Benzoic acid	UG/KG	1800	U	1900	U	1900	U	1900	U	1900	U
2,4-DICHLOROPHENOL	UG/KG	360	U	360	U	360	U	360	U	370	U
1,2,4-TRICHLOROBENZENE	UG/KG	360	U	360	U	360	U	360	U	370	U
4-CHLOROANILINE	UG/KG	720	U	720	U	730	U	720	U	740	U
HEXACHLOROBUTADIENE	UG/KG	360	U	360	U	360	U	360	U	370	U
4-CHLORO-3-METHYLPHENOL	UG/KG	360	U	360	U	360	U	360	U	370	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	360	U	360	U	360	U	360	U	370	U
2,4,6-TRICHLOROPHENOL	UG/KG	360	U	360	U	360	U	360	U	370	U
2,4,5-TRICHLOROPHENOL	UG/KG	360	U	360	U	360	U	360	U	370	U
2-CHLORONAPHTHALENE	UG/KG	360	U	360	U	360	U	360	U	370	U
2-NITROANILINE	UG/KG	1800	U	1900	U	1900	U	1900	U	1900	U
2,6-DINITROTOLUENE	UG/KG	360	U	360	U	360	U	360	U	370	U
3-NITROANILINE	UG/KG	1800	U	1900	U	1900	U	1900	U	1900	U
2,4-DINITROPHENOL	UG/KG	1800	U	1900	U	1900	U	1900	U	1900	U
DIBENZOFURAN	UG/KG	360	U	360	U	360	U	360	U	370	U
4-NITROPHENOL	UG/KG	1800	U	1900	U	1900	U	1900	U	1900	U
2,4-DINITROTOLUENE	UG/KG	360	U	360	U	360	U	360	U	370	U
DIMETHYL PHTHALATE	UG/KG	360	U	360	U	360	U	360	U	370	U
DIETHYL PHTHALATE	UG/KG	360	U	360	U	360	U	360	U	370	U
4-CHLOROPHENYL PHENYL ETHER	UG/KG	360	U	360	U	360	U	360	U	370	U
4-NITROANILINE	UG/KG	1800	U	1900	U	1900	U	1900	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1800	U	1900	U	1900	U	1900	U	1900	U
N-NITROSODIPHENYLAMINE	UG/KG										
4-BROMOPHENYL PHENYL ETHER	UG/KG	360	U	360	U	360	U	360	U	370	U
HEXACHLOROBENZENE	UG/KG	360	U	360	U	360	U	360	U	370	U
PENTACHLOROPHENOL	UG/KG	1800	U	1900	U	1900	U	1900	U	1900	U
DI-n-BUTYL PHTHALATE	UG/KG	360	U	360	U	360	U	360	U	370	U
BENZYL BUTYL PHTHALATE	UG/KG	360	U	360	U	360	U	360	U	370	U
3,3'-DICHLOROBENZIDINE	UG/KG	720	U	720	U	730	U	720	U	740	U
bis(2-ETHYLHEXYL) PHTHALATE	UG/KG	360	U	360	U	360	U	360	U	370	U
DI-n-OCTYLPHTHALATE	UG/KG	360	U	360	U	360	U	360	U	370	U

	StationID	K164SB028		K164SB028		K164SB029		K164SB029		K164SB030	
	SampleID	164SB02801 (0-1ft)		164SB02802 (3-5ft)		164SB02901 (0-1ft)		164SB02902 (3-5ft)		164SB03001 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999		11/19/1999	
	DateAnalyzed	12/07/1999		12/03/1999		12/03/1999		12/03/1999		12/07/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08		NBCK09	
Parameter	Units										
2,4-DIMETHYLPHENOL	UG/KG	370	U	360	U	350	U	370	U	350	U
bis(2-CHLOROETHOXY) METHANE	UG/KG	370	U	360	U	350	U	370	U	350	U
Benzoic acid	UG/KG	1900	U	1900	U	1800	U	1900	U	1800	U
2,4-DICHLOROPHENOL	UG/KG	370	U	360	U	350	U	370	U	350	U
1,2,4-TRICHLOROBENZENE	UG/KG	370	U	360	U	350	U	370	U	350	U
4-CHLOROANILINE	UG/KG	730	U	730	U	710	U	740	U	700	U
HEXACHLOROBUTADIENE	UG/KG	370	U	360	U	350	U	370	U	350	U
4-CHLORO-3-METHYLPHENOL	UG/KG	370	U	360	U	350	U	370	U	350	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	370	U	360	U	350	U	370	U	350	U
2,4,6-TRICHLOROPHENOL	UG/KG	370	U	360	U	350	U	370	U	350	U
2,4,5-TRICHLOROPHENOL	UG/KG	370	U	360	U	350	U	370	U	350	U
2-CHLORONAPHTHALENE	UG/KG	370	U	360	U	350	U	370	U	350	U
2-NITROANILINE	UG/KG	1900	U	1900	U	1800	U	1900	U	1800	U
2,6-DINITROTOLUENE	UG/KG	370	U	360	U	350	U	370	U	350	U
3-NITROANILINE	UG/KG	1900	U	1900	U	1800	U	1900	U	1800	U
2,4-DINITROPHENOL	UG/KG	1900	U	1900	U	1800	U	1900	U	1800	U
DIBENZOFURAN	UG/KG	370	U	360	U	350	U	370	U	350	U
4-NITROPHENOL	UG/KG	1900	U	1900	U	1800	U	1900	U	1800	U
2,4-DINITROTOLUENE	UG/KG	370	U	360	U	350	U	370	U	350	U
DIMETHYL PHTHALATE	UG/KG	370	U	360	U	350	U	370	U	350	U
DIETHYL PHTHALATE	UG/KG	61	J	360	U	350	U	370	U	350	U
4-CHLOROPHENYL PHENYL ETHER	UG/KG	370	U	360	U	350	U	370	U	350	U
4-NITROANILINE	UG/KG	1900	U	1900	U	1800	U	1900	U	1800	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1900	U	1900	U	1800	U	1900	U	1800	U
N-NITROSODIPHENYLAMINE	UG/KG										
4-BROMOPHENYL PHENYL ETHER	UG/KG	370	U	360	U	350	U	370	U	350	U
HEXACHLOROBENZENE	UG/KG	370	U	360	U	350	U	370	U	350	U
PENTACHLOROPHENOL	UG/KG	1900	U	1900	U	1800	U	1900	U	1800	U
DI-n-BUTYL PHTHALATE	UG/KG	370	U	360	U	350	U	370	U	350	U
BENZYL BUTYL PHTHALATE	UG/KG	370	U	360	U	350	U	370	U	350	U
3,3'-DICHLOROBENZIDINE	UG/KG	730	U	730	U	710	U	740	U	700	U
bis(2-ETHYLHEXYL) PHTHALATE	UG/KG	370	U	360	U	350	U	370	U	350	U
DI-n-OCTYLPHTHALATE	UG/KG	370	U	360	U	350	U	370	U	350	U

	StationID	K164SB030		K164SB031		K164SB031		K164SB032		K164SB032	
	SampleID	164SB03002 (3-5ft)		164SB03101 (0-1ft)		164SB03102 (3-5ft)		164SB03201 (0-1ft)		164SB03202 (3-5ft)	
	DateCollected	11/19/1999		11/19/1999		11/19/1999		11/19/1999		11/19/1999	
	DateAnalyzed	12/07/1999		12/07/1999		12/07/1999		12/07/1999		12/07/1999	
	SDGNumber	NBCK09		NBCK09		NBCK09		NBCK09		NBCK09	
Parameter	**Units**										
2,4-DIMETHYLPHENOL	UG/KG	360	U	380	U	370	U	350	U	370	U
bis(2-CHLOROETHOXY) METHANE	UG/KG	360	U	380	U	370	U	350	U	370	U
Benzoic acid	UG/KG	1800	U	1900	U	1900	U	1800	U	1900	U
2,4-DICHLOROPHENOL	UG/KG	360	U	380	U	370	U	350	U	370	U
1,2,4-TRICHLOROBENZENE	UG/KG	360	U	380	U	370	U	350	U	370	U
4-CHLOROANILINE	UG/KG	720	U	750	U	740	U	700	U	740	U
HEXACHLOROBUTADIENE	UG/KG	360	U	380	U	370	U	350	U	370	U
4-CHLORO-3-METHYLPHENOL	UG/KG	360	U	380	U	370	U	350	U	370	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	360	U	380	U	370	U	350	U	370	U
2,4,6-TRICHLOROPHENOL	UG/KG	360	U	380	U	370	U	350	U	370	U
2,4,5-TRICHLOROPHENOL	UG/KG	360	U	380	U	370	U	350	U	370	U
2-CHLORONAPHTHALENE	UG/KG	360	U	380	U	370	U	350	U	370	U
2-NITROANILINE	UG/KG	1800	U	1900	U	1900	U	1800	U	1900	U
2,6-DINITROTOLUENE	UG/KG	360	U	380	U	370	U	350	U	370	U
3-NITROANILINE	UG/KG	1800	U	1900	U	1900	U	1800	U	1900	U
2,4-DINITROPHENOL	UG/KG	1800	U	1900	U	1900	U	1800	U	1900	U
DIBENZOFURAN	UG/KG	360	U	380	U	370	U	350	U	370	U
4-NITROPHENOL	UG/KG	1800	U	1900	U	1900	U	1800	U	1900	U
2,4-DINITROTOLUENE	UG/KG	360	U	380	U	370	U	350	U	370	U
DIMETHYL PHTHALATE	UG/KG	360	U	380	U	370	U	350	U	370	U
DIETHYL PHTHALATE	UG/KG	360	U	380	U	370	U	350	U	370	U
4-CHLOROPHENYL PHENYL ETHER	UG/KG	360	U	380	U	370	U	350	U	370	U
4-NITROANILINE	UG/KG	1800	U	1900	U	1900	U	1800	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1800	U	1900	U	1900	U	1800	U	1900	U
N-NITROSODIPHENYLAMINE	UG/KG										
4-BROMOPHENYL PHENYL ETHER	UG/KG	360	U	380	U	370	U	350	U	370	U
HEXACHLOROBENZENE	UG/KG	360	U	380	U	370	U	350	U	370	U
PENTACHLOROPHENOL	UG/KG	1800	U	1900	U	1900	U	1800	U	1900	U
DI-n-BUTYL PHTHALATE	UG/KG	360	U	380	U	370	U	350	U	370	U
BENZYL BUTYL PHTHALATE	UG/KG	360	U	380	U	370	U	350	U	370	U
3,3'-DICHLOROBENZIDINE	UG/KG	720	U	750	U	740	U	700	U	740	U
bis(2-ETHYLHEXYL) PHTHALATE	UG/KG	360	U	67	J	370	U	51	J	370	U
DI-n-OCTYLPHTHALATE	UG/KG	360	U	380	U	370	U	350	U	370	U

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB033		K164SB033	
	SampleID	164SB03301 (0-1ft)		164SB03302 (3-5ft)	
	DateCollected	12/22/1999		12/22/1999	
	DateAnalyzed	01/07/2000		01/07/2000	
	SDGNumber	41577		41577	
Parameter	**Units**				
2,4-DIMETHYLPHENOL	UG/KG	430	U	380	U
bis(2-CHLOROETHOXY) METHANE	UG/KG	430	U	380	U
Benzoic acid	UG/KG	430	U	380	U
2,4-DICHLOROPHENOL	UG/KG	430	U	380	U
1,2,4-TRICHLOROBENZENE	UG/KG	430	U	380	U
4-CHLOROANILINE	UG/KG	430	U	380	U
HEXACHLOROBUTADIENE	UG/KG	430	U	380	U
4-CHLORO-3-METHYLPHENOL	UG/KG	430	U	380	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	430	U	380	U
2,4,6-TRICHLOROPHENOL	UG/KG	430	U	380	U
2,4,5-TRICHLOROPHENOL	UG/KG	1100	U	960	U
2-CHLORONAPHTHALENE	UG/KG	430	U	380	U
2-NITROANILINE	UG/KG	1100	U	960	U
2,6-DINITROTOLUENE	UG/KG	430	U	380	U
3-NITROANILINE	UG/KG	1100	U	960	U
2,4-DINITROPHENOL	UG/KG	1100	U	960	U
DIBENZOFURAN	UG/KG	430	U	380	U
4-NITROPHENOL	UG/KG	1100	U	960	U
2,4-DINITROTOLUENE	UG/KG	430	U	380	U
DIMETHYL PHTHALATE	UG/KG	430	U	380	U
DIETHYL PHTHALATE	UG/KG	430	U	380	U
4-CHLOROPHENYL PHENYL ETHER	UG/KG	430	U	380	U
4-NITROANILINE	UG/KG	1100	U	960	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1100	U	960	U
N-NITROSODIPHENYLAMINE	UG/KG	430	U	380	U
4-BROMOPHENYL PHENYL ETHER	UG/KG	430	U	380	U
HEXACHLOROBENZENE	UG/KG	430	U	380	U
PENTACHLOROPHENOL	UG/KG	1100	U	960	U
DI-n-BUTYL PHTHALATE	UG/KG	430	U	380	U
BENZYL BUTYL PHTHALATE	UG/KG	430	U	380	U
3,3'-DICHLOROBENZIDINE	UG/KG	430	U	380	U
bis(2-ETHYLHEXYL) PHTHALATE	UG/KG	22	J	24	J
DI-n-OCTYLPHTHALATE	UG/KG	430	U	380	U

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB004		K164SB004	
	SampleID	164SB004S1 (0-1ft)		164SB004S2 (3-5ft)	
	DateCollected	10/12/1999		10/12/1999	
	DateAnalyzed	10/19/1999		10/20/1999	
	SDGNumber	NBCK01		NBCK01	
Parameter	**Units**				
1,2,4-TRICHLOROBENZENE, SPLP	UG/L	10	U	10	U
1,2-DICHLOROBENZENE, SPLP	UG/L	10	U	10	U
1,3-DICHLOROBENZENE, SPLP	UG/L	10	U	10	U
1,4-DICHLOROBENZENE, SPLP	UG/L	10	U	10	U
2,2'-OXYBIS(1-CHLORO)PROPANE, SPLP	UG/L	10	U	10	U
2,4,5-TRICHLOROPHENOL, SPLP	UG/L	10	U	10	U
2,4,6-TRICHLOROPHENOL, SPLP	UG/L	10	U	10	U
2,4-DICHLOROPHENOL, SPLP	UG/L	10	U	10	U
2,4-DIMETHYLPHENOL, SPLP	UG/L	10	U	10	U
2,4-DINITROPHENOL, SPLP	UG/L	50	U	50	U
2,4-DINITROTOLUENE, SPLP	UG/L	10	U	10	U
2,6-DINITROTOLUENE, SPLP	UG/L	10	U	10	U
2-CHLORONAPHTHALENE, SPLP	UG/L	10	U	10	U
2-CHLOROPHENOL, SPLP	UG/L	10	U	10	U
2-METHYLNAPHTHALENE, SPLP	UG/L	10	U	10	U
2-METHYLPHENOL (o-CRESOL), SPLP	UG/L	10	U	10	U
2-NITROANILINE, SPLP	UG/L	50	U	50	U
2-NITROPHENOL, SPLP	UG/L	10	U	10	U
3,3'-DICHLOROBENZIDINE, SPLP	UG/L	20	U	20	U
3-Methylphenol (m-Cresol), SPLP	UG/L	10	U	10	U
3-NITROANILINE, SPLP	UG/L	50	U	50	U
4,6-DINITRO-2-METHYLPHENOL, SPLP	UG/L	50	U	50	U
4-BROMOPHENYL PHENYL ETHER, SPLP	UG/L	10	U	10	U
4-CHLORO-3-METHYLPHENOL, SPLP	UG/L	10	U	10	U
4-CHLOROANILINE, SPLP	UG/L	20	U	20	U
4-CHLOROPHENYL PHENYL ETHER, SPLP	UG/L	10	U	10	U
4-NITROANILINE, SPLP	UG/L	50	U	50	U
4-NITROPHENOL, SPLP	UG/L	50	U	50	U
Benzoic acid, SPLP	UG/L	50	U	50	U
Benzyl alcohol, SPLP	UG/L	10	U	10	U
BENZYL BUTYL PHTHALATE, SPLP	UG/L	10	U	10	U
bis(2-CHLOROETHOXY) METHANE, SPLP	UG/L	10	U	10	U
bis(2-ETHYLHEXYL) PHTHALATE, SPLP	UG/L	10	U	10	U
DI-n-BUTYL PHTHALATE, SPLP	UG/L	10	U	10	U
DI-n-OCTYLPHTHALATE, SPLP	UG/L	10	U	10	U
DIBENZOFURAN, SPLP	UG/L	10	U	10	U

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB004		K164SB004	
	SampleID	164SB004S1 (0-1ft)		164SB004S2 (3-5ft)	
	DateCollected	10/12/1999		10/12/1999	
	DateAnalyzed	10/19/1999		10/20/1999	
	SDGNumber	NBCK01		NBCK01	
Parameter	**Units**				
DIETHYL PHTHALATE, SPLP	UG/L	10	U	10	U
DIMETHYL PHTHALATE, SPLP	UG/L	10	U	10	U
Diphenylamine, SPLP	UG/L	10	U	10	U
HEXACHLOROBENZENE, SPLP	UG/L	10	U	10	U
HEXACHLOROBUTADIENE, SPLP	UG/L	10	U	10	U
HEXACHLOROCYCLOPENTADIENE, SPLP	UG/L	10	U	10	U
HEXACHLOROETHANE, SPLP	UG/L	10	U	10	U
ISOPHORONE, SPLP	UG/L	10	U	10	U
N-NITROSODI-n-PROPYLAMINE, SPLP	UG/L	10	U	10	U
N-Nitrosodimethylamine, SPLP	UG/L	10	U	10	U
NITROBENZENE, SPLP	UG/L	10	U	10	U
PENTACHLOROPHENOL, SPLP	UG/L	50	U	50	U
PHENOL, SPLP	UG/L	10	U	10	U
ACENAPHTHYLENE, SPLP	UG/L	10	U	10	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER), S	UG/L	10	U	10	U
ACENAPHTHENE, SPLP	UG/L	10	U	10	U
FLUORENE, SPLP	UG/L	10	U	10	U
PHENANTHRENE, SPLP	UG/L	10	U	10	U
ANTHRACENE, SPLP	UG/L	10	U	10	U
FLUORANTHENE, SPLP	UG/L	10	U	10	U
PYRENE, SPLP	UG/L	10	U	10	U
BENZO(a)ANTHRACENE, SPLP	UG/L	10	U	10	U
CHRYSENE, SPLP	UG/L	10	U	10	U
BENZO(b)FLUORANTHENE, SPLP	UG/L	10	U	10	U
BENZO(k)FLUORANTHENE, SPLP	UG/L	10	U	10	U
BENZO(a)PYRENE, SPLP	UG/L	10	U	10	U
INDENO(1,2,3-c,d)PYRENE, SPLP	UG/L	10	U	10	U
DIBENZ(a,h)ANTHRACENE, SPLP	UG/L	10	U	10	U
BENZO(g,h,i)PERYLENE, SPLP	UG/L	10	U	10	U

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB004		K164SB004		K164SB004		K164SB004	
	SampleID	164SB004S1 (0-1ft)		164SB004S2 (3-5ft)		164SB004T1 (0-1ft)		164SB004T2 (3-5ft)	
	DateCollected	10/12/1999		10/12/1999		10/12/1999		10/12/1999	
	DateAnalyzed	10/19/1999		10/20/1999		10/15/1999		10/19/1999	
	SDGNumber	NBCK01		NBCK01		NBCK01		NBCK01	
Parameter	**Units**								
BENZENE	UG/KG								
CHLOROMETHANE	UG/KG								
NAPHTHALENE, SPLP	UG/L	10	U	10	U				
NAPHTHALENE	UG/KG					360	U	380	U
TOLUENE	UG/KG								
VINYL CHLORIDE	UG/KG								
BROMOMETHANE	UG/KG								
ETHYLBENZENE	UG/KG								
CHLOROETHANE	UG/KG								
1,1-DICHLOROETHENE	UG/KG								
METHYLENE CHLORIDE	UG/KG								
XYLENES, TOTAL	UG/KG								
1,1-DICHLOROETHANE	UG/KG								
CHLOROFORM	UG/KG								
1,1,1-TRICHLOROETHANE	UG/KG								
CARBON TETRACHLORIDE	UG/KG								
1,2-DICHLOROETHANE	UG/KG								
TRICHLOROETHYLENE (TCE)	UG/KG								
1,2-DICHLOROPROPANE	UG/KG								
BROMODICHLOROMETHANE	UG/KG								
1,1,2-TRICHLOROETHANE	UG/KG								
TETRACHLOROETHYLENE(PCE)	UG/KG								
DIBROMOCHLOROMETHANE	UG/KG								
CHLOROBENZENE	UG/KG								
STYRENE	UG/KG								
BROMOFORM	UG/KG								
1,1,2,2-TETRACHLOROETHANE	UG/KG								
ACETONE	UG/KG								
CARBON DISULFIDE	UG/KG								
Vinyl acetate	UG/KG								
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG								

	StationID	K164SB015		K164SB021		K164SB021		K164SB025	
	SampleID	164SB01501 (0-1ft)		164SB02101 (0-1ft)		164SB02102 (3-5ft)		164SB02501 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	11/30/1999		12/02/1999		12/02/1999		11/30/1999	
	SDGNumber	NBCK08		NBCK07		NBCK07		NBCK08	
Parameter	Units								
BENZENE	UG/KG	5.4	U					5.5	U
CHLOROMETHANE	UG/KG	11	U					11	U
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG			400	U	390	U		
TOLUENE	UG/KG	5.4	U					5.5	U
VINYL CHLORIDE	UG/KG	11	U					11	U
BROMOMETHANE	UG/KG	11	U					11	U
ETHYLBENZENE	UG/KG	5.4	U					5.5	U
CHLOROETHANE	UG/KG	11	U					11	U
1,1-DICHLOROETHENE	UG/KG	5.4	U					5.5	U
METHYLENE CHLORIDE	UG/KG	5.4	U					5.5	U
XYLENES, TOTAL	UG/KG	11	U					11	U
1,1-DICHLOROETHANE	UG/KG	5.4	U					5.5	U
CHLOROFORM	UG/KG	5.4	U					5.5	U
1,1,1-TRICHLOROETHANE	UG/KG	5.4	U					5.5	U
CARBON TETRACHLORIDE	UG/KG	5.4	U					5.5	U
1,2-DICHLOROETHANE	UG/KG	5.4	U					5.5	U
TRICHLOROETHYLENE (TCE)	UG/KG	5.4	U					5.5	U
1,2-DICHLOROPROPANE	UG/KG	5.4	U					5.5	U
BROMODICHLOROMETHANE	UG/KG	5.4	U					5.5	U
1,1,2-TRICHLOROETHANE	UG/KG	5.4	U					5.5	U
TETRACHLOROETHYLENE(PCE)	UG/KG	5.4	U					5.5	U
DIBROMOCHLOROMETHANE	UG/KG	5.4	U					5.5	U
CHLOROBENZENE	UG/KG	5.4	U					5.5	U
STYRENE	UG/KG	5.4	U					5.5	U
BROMOFORM	UG/KG	5.4	U					5.5	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.4	U					5.5	U
ACETONE	UG/KG	54	U					55	U
CARBON DISULFIDE	UG/KG	5.4	U					5.5	U
Vinyl acetate	UG/KG	11	UJ					11	UJ
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG	27	U					28	U

	StationID	K164SB025		K164SB025		K164SB025		K164SB026	
	SampleID	164SB02501 (0-1ft)		164SB02502 (3-5ft)		164SB02502 (3-5ft)		164SB02601 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	12/03/1999		11/30/1999		12/03/1999		11/30/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08	
Parameter	**Units**								
BENZENE	UG/KG			6.4	U			5.2	U
CHLOROMETHANE	UG/KG			13	U			10	U
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG	360	U			360	U		
TOLUENE	UG/KG			6.4	U			5.2	U
VINYL CHLORIDE	UG/KG			13	U			10	U
BROMOMETHANE	UG/KG			13	U			10	U
ETHYLBENZENE	UG/KG			6.4	U			5.2	U
CHLOROETHANE	UG/KG			13	U			10	U
1,1-DICHLOROETHENE	UG/KG			6.4	U			5.2	U
METHYLENE CHLORIDE	UG/KG			6.4	U			5.2	U
XYLENES, TOTAL	UG/KG			13	U			10	U
1,1-DICHLOROETHANE	UG/KG			6.4	U			5.2	U
CHLOROFORM	UG/KG			6.4	U			5.2	U
1,1,1-TRICHLOROETHANE	UG/KG			6.4	U			5.2	U
CARBON TETRACHLORIDE	UG/KG			6.4	U			5.2	U
1,2-DICHLOROETHANE	UG/KG			6.4	U			5.2	U
TRICHLOROETHYLENE (TCE)	UG/KG			6.4	U			5.2	U
1,2-DICHLOROPROPANE	UG/KG			6.4	U			5.2	U
BROMODICHLOROMETHANE	UG/KG			6.4	U			5.2	U
1,1,2-TRICHLOROETHANE	UG/KG			6.4	U			5.2	U
TETRACHLOROETHYLENE(PCE)	UG/KG			6.4	U			5.2	U
DIBROMOCHLOROMETHANE	UG/KG			6.4	U			5.2	U
CHLOROBENZENE	UG/KG			6.4	U			5.2	U
STYRENE	UG/KG			6.4	U			5.2	U
BROMOFORM	UG/KG			6.4	U			5.2	U
1,1,2,2-TETRACHLOROETHANE	UG/KG			6.4	U			5.2	U
ACETONE	UG/KG			64	U			52	U
CARBON DISULFIDE	UG/KG			6.4	U			5.2	U
Vinyl acetate	UG/KG			13	UJ			10	UJ
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG			32	U			26	U

	StationID	K164SB026		K164SB026		K164SB026		K164SB027	
	SampleID	164SB02601 (0-1ft)		164SB02602 (3-5ft)		164SB02602 (3-5ft)		164SB02701 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	12/03/1999		11/30/1999		12/03/1999		11/30/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08	
Parameter	**Units**								
BENZENE	UG/KG			5.8	U			5.7	U
CHLOROMETHANE	UG/KG			12	U			11	U
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG	360	U			360	U		
TOLUENE	UG/KG			5.8	U			5.7	U
VINYL CHLORIDE	UG/KG			12	U			11	U
BROMOMETHANE	UG/KG			12	U			11	U
ETHYLBENZENE	UG/KG			5.8	U			5.7	U
CHLOROETHANE	UG/KG			12	U			11	U
1,1-DICHLOROETHENE	UG/KG			5.8	U			5.7	U
METHYLENE CHLORIDE	UG/KG			5.8	U			5.7	U
XYLENES, TOTAL	UG/KG			12	U			11	U
1,1-DICHLOROETHANE	UG/KG			5.8	U			5.7	U
CHLOROFORM	UG/KG			5.8	U			5.7	U
1,1,1-TRICHLOROETHANE	UG/KG			5.8	U			5.7	U
CARBON TETRACHLORIDE	UG/KG			5.8	U			5.7	U
1,2-DICHLOROETHANE	UG/KG			5.8	U			5.7	U
TRICHLOROETHYLENE (TCE)	UG/KG			5.8	U			5.7	U
1,2-DICHLOROPROPANE	UG/KG			5.8	U			5.7	U
BROMODICHLOROMETHANE	UG/KG			5.8	U			5.7	U
1,1,2-TRICHLOROETHANE	UG/KG			5.8	U			5.7	U
TETRACHLOROETHYLENE(PCE)	UG/KG			5.8	U			5.7	U
DIBROMOCHLOROMETHANE	UG/KG			5.8	U			5.7	U
CHLOROBENZENE	UG/KG			5.8	U			5.7	U
STYRENE	UG/KG			5.8	U			5.7	U
BROMOFORM	UG/KG			5.8	U			5.7	U
1,1,2,2-TETRACHLOROETHANE	UG/KG			5.8	U			5.7	U
ACETONE	UG/KG			58	U			57	U
CARBON DISULFIDE	UG/KG			5.8	U			5.7	U
Vinyl acetate	UG/KG			12	UJ			11	UJ
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG			29	U			29	U

	StationID	K164SB027		K164SB027		K164SB027		K164SB028	
	SampleID	164SB02701 (0-1ft)		164SB02702 (3-5ft)		164SB02702 (3-5ft)		164SB02801 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	12/03/1999		11/30/1999		12/03/1999		11/30/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08	
Parameter	**Units**								
BENZENE	UG/KG			5.8	U			6.2	U
CHLOROMETHANE	UG/KG			12	U			12	U
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG	360	U			370	U		
TOLUENE	UG/KG			5.8	U			6.2	U
VINYL CHLORIDE	UG/KG			12	U			12	U
BROMOMETHANE	UG/KG			12	U			12	U
ETHYLBENZENE	UG/KG			5.8	U			6.2	U
CHLOROETHANE	UG/KG			12	U			12	U
1,1-DICHLOROETHENE	UG/KG			5.8	U			6.2	U
METHYLENE CHLORIDE	UG/KG			5.8	U			6.2	U
XYLENES, TOTAL	UG/KG			12	U			12	U
1,1-DICHLOROETHANE	UG/KG			5.8	U			6.2	U
CHLOROFORM	UG/KG			5.8	U			6.2	U
1,1,1-TRICHLOROETHANE	UG/KG			5.8	U			6.2	U
CARBON TETRACHLORIDE	UG/KG			5.8	U			6.2	U
1,2-DICHLOROETHANE	UG/KG			5.8	U			6.2	U
TRICHLOROETHYLENE (TCE)	UG/KG			5.8	U			6.2	U
1,2-DICHLOROPROPANE	UG/KG			5.8	U			6.2	U
BROMODICHLOROMETHANE	UG/KG			5.8	U			6.2	U
1,1,2-TRICHLOROETHANE	UG/KG			5.8	U			6.2	U
TETRACHLOROETHYLENE(PCE)	UG/KG			5.8	U			6.2	U
DIBROMOCHLOROMETHANE	UG/KG			5.8	U			6.2	U
CHLOROBENZENE	UG/KG			5.8	U			6.2	U
STYRENE	UG/KG			5.8	U			6.2	U
BROMOFORM	UG/KG			5.8	U			6.2	U
1,1,2,2-TETRACHLOROETHANE	UG/KG			5.8	U			6.2	U
ACETONE	UG/KG			58	U			62	U
CARBON DISULFIDE	UG/KG			5.8	U			6.2	U
Vinyl acetate	UG/KG			12	UJ			12	UJ
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG			29	U			31	U

	StationID	K164SB028		K164SB028		K164SB028		K164SB029	
	SampleID	164SB02801 (0-1ft)		164SB02802 (3-5ft)		164SB02802 (3-5ft)		164SB02901 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	12/07/1999		11/30/1999		12/03/1999		11/30/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08	
Parameter	**Units**								
BENZENE	UG/KG			5.1	U			5.8	U
CHLOROMETHANE	UG/KG			10	U			12	U
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG	370	U			360	U		
TOLUENE	UG/KG			5.1	U			5.8	U
VINYL CHLORIDE	UG/KG			10	U			12	U
BROMOMETHANE	UG/KG			10	U			12	U
ETHYLBENZENE	UG/KG			5.1	U			5.8	U
CHLOROETHANE	UG/KG			10	U			12	U
1,1-DICHLOROETHENE	UG/KG			5.1	U			5.8	U
METHYLENE CHLORIDE	UG/KG			5.1	U			5.8	U
XYLENES, TOTAL	UG/KG			10	U			12	U
1,1-DICHLOROETHANE	UG/KG			5.1	U			5.8	U
CHLOROFORM	UG/KG			5.1	U			5.8	U
1,1,1-TRICHLOROETHANE	UG/KG			5.1	U			5.8	U
CARBON TETRACHLORIDE	UG/KG			5.1	U			5.8	U
1,2-DICHLOROETHANE	UG/KG			5.1	U			5.8	U
TRICHLOROETHYLENE (TCE)	UG/KG			5.1	U			5.8	U
1,2-DICHLOROPROPANE	UG/KG			5.1	U			5.8	U
BROMODICHLOROMETHANE	UG/KG			5.1	U			5.8	U
1,1,2-TRICHLOROETHANE	UG/KG			5.1	U			5.8	U
TETRACHLOROETHYLENE(PCE)	UG/KG			5.1	U			5.8	U
DIBROMOCHLOROMETHANE	UG/KG			5.1	U			5.8	U
CHLOROBENZENE	UG/KG			5.1	U			5.8	U
STYRENE	UG/KG			5.1	U			5.8	U
BROMOFORM	UG/KG			5.1	U			5.8	U
1,1,2,2-TETRACHLOROETHANE	UG/KG			5.1	U			5.8	U
ACETONE	UG/KG			51	U			58	U
CARBON DISULFIDE	UG/KG			5.1	U			5.8	U
Vinyl acetate	UG/KG			10	UJ			12	UJ
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG			26	U			29	U

	StationID	K164SB029		K164SB029		K164SB029		K164SB030	
	SampleID	164SB02901 (0-1ft)		164SB02902 (3-5ft)		164SB02902 (3-5ft)		164SB03001 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/19/1999	
	DateAnalyzed	12/03/1999		11/30/1999		12/03/1999		12/02/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK09	
Parameter	**Units**								
BENZENE	UG/KG			5.6	U			5.4	U
CHLOROMETHANE	UG/KG			11	U			11	U
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG	350	U			370	U		
TOLUENE	UG/KG			5.6	U			5.4	U
VINYL CHLORIDE	UG/KG			11	U			11	U
BROMOMETHANE	UG/KG			11	U			11	U
ETHYLBENZENE	UG/KG			5.6	U			5.4	U
CHLOROETHANE	UG/KG			11	U			11	U
1,1-DICHLOROETHENE	UG/KG			5.6	U			5.4	U
METHYLENE CHLORIDE	UG/KG			5.6	U			5.4	U
XYLENES, TOTAL	UG/KG			11	U			11	U
1,1-DICHLOROETHANE	UG/KG			5.6	U			5.4	U
CHLOROFORM	UG/KG			5.6	U			5.4	U
1,1,1-TRICHLOROETHANE	UG/KG			5.6	U			5.4	U
CARBON TETRACHLORIDE	UG/KG			5.6	U			5.4	U
1,2-DICHLOROETHANE	UG/KG			5.6	U			5.4	U
TRICHLOROETHYLENE (TCE)	UG/KG			5.6	U			5.4	U
1,2-DICHLOROPROPANE	UG/KG			5.6	U			5.4	U
BROMODICHLOROMETHANE	UG/KG			5.6	U			5.4	U
1,1,2-TRICHLOROETHANE	UG/KG			5.6	U			5.4	U
TETRACHLOROETHYLENE(PCE)	UG/KG			5.6	U			5.4	U
DIBROMOCHLOROMETHANE	UG/KG			5.6	U			5.4	U
CHLOROBENZENE	UG/KG			5.6	U			5.4	U
STYRENE	UG/KG			5.6	U			5.4	U
BROMOFORM	UG/KG			5.6	U			5.4	U
1,1,2,2-TETRACHLOROETHANE	UG/KG			5.6	U			5.4	U
ACETONE	UG/KG			56	U			54	U
CARBON DISULFIDE	UG/KG			5.6	U			5.4	U
Vinyl acetate	UG/KG			11	UJ			11	U
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG			28	U			27	U

	StationID	K164SB030		K164SB030		K164SB030		K164SB031	
	SampleID	164SB03001 (0-1ft)		164SB03002 (3-5ft)		164SB03002 (3-5ft)		164SB03101 (0-1ft)	
	DateCollected	11/19/1999		11/19/1999		11/19/1999		11/19/1999	
	DateAnalyzed	12/07/1999		12/02/1999		12/07/1999		12/07/1999	
	SDGNumber	NBCK09		NBCK09		NBCK09		NBCK09	
Parameter	**Units**								
BENZENE	UG/KG			5.4	U				
CHLOROMETHANE	UG/KG			11	U				
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG	350	U			360	U	380	U
TOLUENE	UG/KG			5.4	U				
VINYL CHLORIDE	UG/KG			11	U				
BROMOMETHANE	UG/KG			11	U				
ETHYLBENZENE	UG/KG			5.4	U				
CHLOROETHANE	UG/KG			11	U				
1,1-DICHLOROETHENE	UG/KG			5.4	U				
METHYLENE CHLORIDE	UG/KG			5.4	U				
XYLENES, TOTAL	UG/KG			11	U				
1,1-DICHLOROETHANE	UG/KG			5.4	U				
CHLOROFORM	UG/KG			5.4	U				
1,1,1-TRICHLOROETHANE	UG/KG			5.4	U				
CARBON TETRACHLORIDE	UG/KG			5.4	U				
1,2-DICHLOROETHANE	UG/KG			5.4	U				
TRICHLOROETHYLENE (TCE)	UG/KG			5.4	U				
1,2-DICHLOROPROPANE	UG/KG			5.4	U				
BROMODICHLOROMETHANE	UG/KG			5.4	U				
1,1,2-TRICHLOROETHANE	UG/KG			5.4	U				
TETRACHLOROETHYLENE(PCE)	UG/KG			5.4	U				
DIBROMOCHLOROMETHANE	UG/KG			5.4	U				
CHLOROBENZENE	UG/KG			5.4	U				
STYRENE	UG/KG			5.4	U				
BROMOFORM	UG/KG			5.4	U				
1,1,2,2-TETRACHLOROETHANE	UG/KG			5.4	U				
ACETONE	UG/KG			54	U				
CARBON DISULFIDE	UG/KG			5.4	U				
Vinyl acetate	UG/KG			11	U				
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG			27	U				

	StationID	K164SB031		K164SB031		K164SB031		K164SB032	
	SampleID	164SB03101 (0-1ft)		164SB03102 (3-5ft)		164SB03102 (3-5ft)		164SB03201 (0-1ft)	
	DateCollected	11/19/1999		11/19/1999		11/19/1999		11/19/1999	
	DateAnalyzed	12/09/1999		12/02/1999		12/07/1999		12/02/1999	
	SDGNumber	NBCK09		NBCK09		NBCK09		NBCK09	
Parameter	**Units**								
BENZENE	UG/KG	5.5	U	5.6	U			5.3	U
CHLOROMETHANE	UG/KG	11	U	11	U			11	U
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG					370	U		
TOLUENE	UG/KG	5.5	U	5.6	U			5.3	U
VINYL CHLORIDE	UG/KG	11	U	11	U			11	U
BROMOMETHANE	UG/KG	11	U	11	U			11	U
ETHYLBENZENE	UG/KG	5.5	U	5.6	U			5.3	U
CHLOROETHANE	UG/KG	11	U	11	U			11	U
1,1-DICHLOROETHENE	UG/KG	5.5	U	5.6	U			5.3	U
METHYLENE CHLORIDE	UG/KG	5.5	U	5.6	U			5.3	U
XYLENES, TOTAL	UG/KG	11	U	11	U			11	U
1,1-DICHLOROETHANE	UG/KG	5.5	U	5.6	U			5.3	U
CHLOROFORM	UG/KG	5.5	U	5.6	U			5.3	U
1,1,1-TRICHLOROETHANE	UG/KG	5.5	U	5.6	U			5.3	U
CARBON TETRACHLORIDE	UG/KG	5.5	U	5.6	U			5.3	U
1,2-DICHLOROETHANE	UG/KG	5.5	U	5.6	U			5.3	U
TRICHLOROETHYLENE (TCE)	UG/KG	5.5	U	5.6	U			5.3	U
1,2-DICHLOROPROPANE	UG/KG	5.5	U	5.6	U			5.3	U
BROMODICHLOROMETHANE	UG/KG	5.5	U	5.6	U			5.3	U
1,1,2-TRICHLOROETHANE	UG/KG	5.5	U	5.6	U			5.3	U
TETRACHLOROETHYLENE(PCE)	UG/KG	5.5	U	5.6	U			5.3	U
DIBROMOCHLOROMETHANE	UG/KG	5.5	U	5.6	U			5.3	U
CHLOROBENZENE	UG/KG	5.5	U	5.6	U			5.3	U
STYRENE	UG/KG	5.5	U	5.6	U			5.3	U
BROMOFORM	UG/KG	5.5	U	5.6	U			5.3	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.5	U	5.6	U			5.3	U
ACETONE	UG/KG	55	U	56	U			53	U
CARBON DISULFIDE	UG/KG	5.5	U	5.6	U			5.3	U
Vinyl acetate	UG/KG	11	U	11	U			11	U
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG	27	U	28	U			26	U

	StationID	K164SB032		K164SB032		K164SB032		K164SB033	
	SampleID	164SB03201 (0-1ft)		164SB03202 (3-5ft)		164SB03202 (3-5ft)		164SB03301 (0-1ft)	
	DateCollected	11/19/1999		11/19/1999		11/19/1999		12/22/1999	
	DateAnalyzed	12/07/1999		12/02/1999		12/07/1999		01/07/2000	
	SDGNumber	NBCK09		NBCK09		NBCK09		41577	
Parameter	**Units**								
BENZENE	UG/KG			5.5	U				
CHLOROMETHANE	UG/KG			11	U				
NAPHTHALENE, SPLP	UG/L								
NAPHTHALENE	UG/KG	350	U			370	U	430	U
TOLUENE	UG/KG			5.5	U				
VINYL CHLORIDE	UG/KG			11	U				
BROMOMETHANE	UG/KG			11	U				
ETHYLBENZENE	UG/KG			5.5	U				
CHLOROETHANE	UG/KG			11	U				
1,1-DICHLOROETHENE	UG/KG			5.5	U				
METHYLENE CHLORIDE	UG/KG			5.5	U				
XYLENES, TOTAL	UG/KG			11	U				
1,1-DICHLOROETHANE	UG/KG			5.5	U				
CHLOROFORM	UG/KG			5.5	U				
1,1,1-TRICHLOROETHANE	UG/KG			5.5	U				
CARBON TETRACHLORIDE	UG/KG			5.5	U				
1,2-DICHLOROETHANE	UG/KG			5.5	U				
TRICHLOROETHYLENE (TCE)	UG/KG			5.5	U				
1,2-DICHLOROPROPANE	UG/KG			5.5	U				
BROMODICHLOROMETHANE	UG/KG			5.5	U				
1,1,2-TRICHLOROETHANE	UG/KG			5.5	U				
TETRACHLOROETHYLENE(PCE)	UG/KG			5.5	U				
DIBROMOCHLOROMETHANE	UG/KG			5.5	U				
CHLOROBENZENE	UG/KG			5.5	U				
STYRENE	UG/KG			5.5	U				
BROMOFORM	UG/KG			5.5	U				
1,1,2,2-TETRACHLOROETHANE	UG/KG			5.5	U				
ACETONE	UG/KG			55	U				
CARBON DISULFIDE	UG/KG			5.5	U				
Vinyl acetate	UG/KG			11	U				
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG			28	U				

	StationID	K164SB033	
	SampleID	164SB03302 (3-5ft)	
	DateCollected	12/22/1999	
	DateAnalyzed	01/07/2000	
	SDGNumber	41577	
Parameter	**Units**		
BENZENE	UG/KG		
CHLOROMETHANE	UG/KG		
NAPHTHALENE, SPLP	UG/L		
NAPHTHALENE	UG/KG	380	U
TOLUENE	UG/KG		
VINYL CHLORIDE	UG/KG		
BROMOMETHANE	UG/KG		
ETHYLBENZENE	UG/KG		
CHLOROETHANE	UG/KG		
1,1-DICHLOROETHENE	UG/KG		
METHYLENE CHLORIDE	UG/KG		
XYLENES, TOTAL	UG/KG		
1,1-DICHLOROETHANE	UG/KG		
CHLOROFORM	UG/KG		
1,1,1-TRICHLOROETHANE	UG/KG		
CARBON TETRACHLORIDE	UG/KG		
1,2-DICHLOROETHANE	UG/KG		
TRICHLOROETHYLENE (TCE)	UG/KG		
1,2-DICHLOROPROPANE	UG/KG		
BROMODICHLOROMETHANE	UG/KG		
1,1,2-TRICHLOROETHANE	UG/KG		
TETRACHLOROETHYLENE(PCE)	UG/KG		
DIBROMOCHLOROMETHANE	UG/KG		
CHLOROBENZENE	UG/KG		
STYRENE	UG/KG		
BROMOFORM	UG/KG		
1,1,2,2-TETRACHLOROETHANE	UG/KG		
ACETONE	UG/KG		
CARBON DISULFIDE	UG/KG		
Vinyl acetate	UG/KG		
METHYL ETHYL KETONE (2-BUTANONE)	UG/KG		

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB004	K164SB004	K164SB004	K164SB004
	SampleID	164SB004S1 (0-1ft)	164SB004S2 (3-5ft)	164SB004T1 (0-1ft)	164SB004T2 (3-5ft)
	DateCollected	10/12/1999	10/12/1999	10/12/1999	10/12/1999
	DateAnalyzed	10/19/1999	10/20/1999	10/15/1999	10/19/1999
	SDGNumber	NBCK01	NBCK01	NBCK01	NBCK01
Parameter	**Units**				
2-Chloroethyl vinyl ether	UG/KG				
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG				
cis-1,3-DICHLOROPROPENE	UG/KG				
trans-1,3-DICHLOROPROPENE	UG/KG				
2-HEXANONE	UG/KG				
1,2-Dichloroethene (total)	UG/KG				

	StationID	K164SB015		K164SB021		K164SB021		K164SB025	
	SampleID	164SB01501 (0-1ft)		164SB02101 (0-1ft)		164SB02102 (3-5ft)		164SB02501 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	11/30/1999		12/02/1999		12/02/1999		11/30/1999	
	SDGNumber	NBCK08		NBCK07		NBCK07		NBCK08	
Parameter	**Units**								
2-Chloroethyl vinyl ether	UG/KG	54	U					55	U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG	27	U					28	U
cis-1,3-DICHLOROPROPENE	UG/KG	5.4	U					5.5	U
trans-1,3-DICHLOROPROPENE	UG/KG	5.4	U					5.5	U
2-HEXANONE	UG/KG	27	U					28	U
1,2-Dichloroethene (total)	UG/KG	5.4	U					5.5	U

	StationID	K164SB025		K164SB025		K164SB025		K164SB026	
	SampleID	164SB02501 (0-1ft)		164SB02502 (3-5ft)		164SB02502 (3-5ft)		164SB02601 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	12/03/1999		11/30/1999		12/03/1999		11/30/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08	
Parameter	**Units**								
2-Chloroethyl vinyl ether	UG/KG			64	U			52	U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG			32	U			26	U
cis-1,3-DICHLOROPROPENE	UG/KG			6.4	U			5.2	U
trans-1,3-DICHLOROPROPENE	UG/KG			6.4	U			5.2	U
2-HEXANONE	UG/KG			32	U			26	U
1,2-Dichloroethene (total)	UG/KG			6.4	U			5.2	U

	StationID	K164SB026		K164SB026		K164SB026		K164SB027	
	SampleID	164SB02601 (0-1ft)		164SB02602 (3-5ft)		164SB02602 (3-5ft)		164SB02701 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	12/03/1999		11/30/1999		12/03/1999		11/30/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK08	
Parameter	**Units**								
2-Chloroethyl vinyl ether	UG/KG			58	U			57	U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG			29	U			29	U
cis-1,3-DICHLOROPROPENE	UG/KG			5.8	U			5.7	U
trans-1,3-DICHLOROPROPENE	UG/KG			5.8	U			5.7	U
2-HEXANONE	UG/KG			29	U			29	U
1,2-Dichloroethene (total)	UG/KG			5.8	U			5.7	U

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB027		K164SB027		K164SB027	K164SB028	
	SampleID	164SB02701 (0-1ft)		164SB02702 (3-5ft)		164SB02702 (3-5ft)	164SB02801 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999	11/18/1999	
	DateAnalyzed	12/03/1999		11/30/1999		12/03/1999	11/30/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08	NBCK08	
Parameter	**Units**							
2-Chloroethyl vinyl ether	UG/KG			58	U		62	U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG			29	U		31	U
cis-1,3-DICHLOROPROPENE	UG/KG			5.8	U		6.2	U
trans-1,3-DICHLOROPROPENE	UG/KG			5.8	U		6.2	U
2-HEXANONE	UG/KG			29	U		31	U
1,2-Dichloroethene (total)	UG/KG			5.8	U		6.2	U

	StationID	K164SB028		K164SB028		K164SB028	K164SB029	
	SampleID	164SB02801 (0-1ft)		164SB02802 (3-5ft)		164SB02802 (3-5ft)	164SB02901 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999	11/18/1999	
	DateAnalyzed	12/07/1999		11/30/1999		12/03/1999	11/30/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08	NBCK08	
Parameter	**Units**							
2-Chloroethyl vinyl ether	UG/KG			51	U		58	U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG			26	U		29	U
cis-1,3-DICHLOROPROPENE	UG/KG			5.1	U		5.8	U
trans-1,3-DICHLOROPROPENE	UG/KG			5.1	U		5.8	U
2-HEXANONE	UG/KG			26	U		29	U
1,2-Dichloroethene (total)	UG/KG			5.1	U		5.8	U

	StationID	K164SB029		K164SB029		K164SB029		K164SB030	
	SampleID	164SB02901 (0-1ft)		164SB02902 (3-5ft)		164SB02902 (3-5ft)		164SB03001 (0-1ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/19/1999	
	DateAnalyzed	12/03/1999		11/30/1999		12/03/1999		12/02/1999	
	SDGNumber	NBCK08		NBCK08		NBCK08		NBCK09	
Parameter	**Units**								
2-Chloroethyl vinyl ether	UG/KG			56	U			54	U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG			28	U			27	U
cis-1,3-DICHLOROPROPENE	UG/KG			5.6	U			5.4	U
trans-1,3-DICHLOROPROPENE	UG/KG			5.6	U			5.4	U
2-HEXANONE	UG/KG			28	U			27	U
1,2-Dichloroethene (total)	UG/KG			5.6	U			5.4	U

	StationID	K164SB030		K164SB030		K164SB030	K164SB031
	SampleID	164SB03001 (0-1ft)		164SB03002 (3-5ft)		164SB03002 (3-5ft)	164SB03101 (0-1ft)
	DateCollected	11/19/1999		11/19/1999		11/19/1999	11/19/1999
	DateAnalyzed	12/07/1999		12/02/1999		12/07/1999	12/07/1999
	SDGNumber	NBCK09		NBCK09		NBCK09	NBCK09
Parameter	**Units**						
2-Chloroethyl vinyl ether	UG/KG			54	U		
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG			27	U		
cis-1,3-DICHLOROPROPENE	UG/KG			5.4	U		
trans-1,3-DICHLOROPROPENE	UG/KG			5.4	U		
2-HEXANONE	UG/KG			27	U		
1,2-Dichloroethene (total)	UG/KG			5.4	U		

	StationID	K164SB031		K164SB031		K164SB031	K164SB032	
	SampleID	164SB03101 (0-1ft)		164SB03102 (3-5ft)		164SB03102 (3-5ft)	164SB03201 (0-1ft)	
	DateCollected	11/19/1999		11/19/1999		11/19/1999	11/19/1999	
	DateAnalyzed	12/09/1999		12/02/1999		12/07/1999	12/02/1999	
	SDGNumber	NBCK09		NBCK09		NBCK09	NBCK09	
Parameter	**Units**							
2-Chloroethyl vinyl ether	UG/KG	55	U	56	U		53	U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG	27	U	28	U		26	U
cis-1,3-DICHLOROPROPENE	UG/KG	5.5	U	5.6	U		5.3	U
trans-1,3-DICHLOROPROPENE	UG/KG	5.5	U	5.6	U		5.3	U
2-HEXANONE	UG/KG	27	U	28	U		26	U
1,2-Dichloroethene (total)	UG/KG	5.5	U	5.6	U		5.3	U

	StationID	K164SB032		K164SB032		K164SB032	K164SB033
	SampleID	164SB03201 (0-1ft)		164SB03202 (3-5ft)		164SB03202 (3-5ft)	164SB03301 (0-1ft)
	DateCollected	11/19/1999		11/19/1999		11/19/1999	12/22/1999
	DateAnalyzed	12/07/1999		12/02/1999		12/07/1999	01/07/2000
	SDGNumber	NBCK09		NBCK09		NBCK09	41577
Parameter	**Units**						
2-Chloroethyl vinyl ether	UG/KG			55	U		
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG			28	U		
cis-1,3-DICHLOROPROPENE	UG/KG			5.5	U		
trans-1,3-DICHLOROPROPENE	UG/KG			5.5	U		
2-HEXANONE	UG/KG			28	U		
1,2-Dichloroethene (total)	UG/KG			5.5	U		

	StationID	K164SB033
	SampleID	164SB03302 (3-5ft)
	DateCollected	12/22/1999
	DateAnalyzed	01/07/2000
	SDGNumber	41577
Parameter	**Units**	
2-Chloroethyl vinyl ether	UG/KG	
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	UG/KG	
cis-1,3-DICHLOROPROPENE	UG/KG	
trans-1,3-DICHLOROPROPENE	UG/KG	
2-HEXANONE	UG/KG	
1,2-Dichloroethene (total)	UG/KG	

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB001		K164SB001		K164SB002		K164SB002	
	SampleID	164SB001S1 (0-1ft)		164SB001S2 (3-5ft)		164SB002S1 (0-1ft)		164SB002S2 (3-5ft)	
	DateCollected	10/12/1999		10/12/1999		10/12/1999		10/12/1999	
	DateAnalyzed	10/20/1999		10/20/1999		10/20/1999		10/20/1999	
	SDGNumber	NBCK01		NBCK01		NBCK01		NBCK01	
Parameter	**Units**								
ALUMINUM, SPLP	UG/L	3670	J	3490	J	7930	J	11700	J
ANTIMONY, SPLP	UG/L	1.8	UJ	1.8	UJ	1.8	UJ	1.8	UJ
ARSENIC,SPLP	UG/L	3.6	U	3.6	U	34.7	=	66.4	=
BARIUM, SPLP	UG/L	11.4	=	3.9	U	10.6	=	13.3	=
BERYLLIUM, SPLP	UG/L	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ
CADMIUM, SPLP	UG/L	0.4	UJ	0.4	UJ	0.4	UJ	0.4	UJ
CALCIUM, SPLP	UG/L	25500	=	2620	=	1660	=	1220	=
COBALT, SPLP	UG/L	0.7	U	0.7	U	0.7	U	0.7	U
COPPER, SPLP	UG/L	0.6	UJ	0.6	UJ	15.7	J	2.6	U
CHROMIUM, TOTAL	UG/L	2.7	J	2.4	J	7.4	J	10.5	=
IRON, SPLP	UG/L	1500	J	634	J	2060	J	2550	J
LEAD, SPLP	UG/L	2	U	2	U	8.9	=	5.2	=
MAGNESIUM, SPLP	UG/L	1080	J	475	U	480	U	510	U
MANGANESE, SPLP	UG/L	1.5	J	0.99	J	6.8	J	5.1	J
MERCURY, SPLP	UG/L	0.1	U	0.1	U	0.1	U	0.1	U
NICKEL, SPLP	UG/L	1.2	UJ	1.2	UJ	3.4	J	4.9	J
POTASSIUM, SPLP	UG/L	232	U	128	U	230	U	267	U
SELENIUM, SPLP	UG/L	2.6	UJ	2.6	UJ	2.6	UJ	2.6	UJ
SILVER, SPLP	UG/L	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
SODIUM, SPLP	UG/L	1870	=	1550	=	1010	=	3420	=
THALLIUM, SPLP	UG/L	3.2	UJ	3.2	UJ	3.2	UJ	3.2	UJ
Tin (Sn), SPLP	UG/L	2.8	U	2.8	U	2.8	U	2.8	U
VANADIUM, SPLP	UG/L	6.5	J	5.9	J	12.8	=	17.9	=
ZINC, SPLP	UG/L	9	U	5	U	36.1	=	16.1	U

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB005		K164SB006		K164SB006	
	SampleID	164SB005S2 (3-5ft)		164SB006S1 (0-1ft)		164SB006S2 (3-5ft)	
	DateCollected	10/12/1999		10/12/1999		10/12/1999	
	DateAnalyzed	10/20/1999		10/20/1999		10/20/1999	
	SDGNumber	NBCK01		NBCK01		NBCK01	
Parameter	**Units**						
ALUMINUM, SPLP	UG/L	12600	J	6710	J	17700	J
ANTIMONY, SPLP	UG/L	1.8	UJ	1.8	UJ	1.8	UJ
ARSENIC,SPLP	UG/L	3.6	U	4.1	J	3.6	U
BARIUM, SPLP	UG/L	14.3	=	12.5	=	22	=
BERYLLIUM, SPLP	UG/L	0.1	UJ	0.1	UJ	0.1	UJ
CADMIUM, SPLP	UG/L	0.4	UJ	0.4	UJ	0.4	UJ
CALCIUM, SPLP	UG/L	1130	U	5680	=	1440	=
COBALT, SPLP	UG/L	0.7	U	0.7	U	0.7	U
COPPER, SPLP	UG/L	2	U	3.5	J	3.6	J
CHROMIUM, TOTAL	UG/L	7.5	J	5.9	J	13.9	=
IRON, SPLP	UG/L	1870	J	1860	J	2460	J
LEAD, SPLP	UG/L	6.7	=	22.2	=	7.5	=
MAGNESIUM, SPLP	UG/L	460	U	587	J	940	J
MANGANESE, SPLP	UG/L	5.2	J	7.2	J	8.7	J
MERCURY, SPLP	UG/L	0.1	U	0.1	U	0.1	U
NICKEL, SPLP	UG/L	2.2	J	1.8	J	3	J
POTASSIUM, SPLP	UG/L	252	U	186	U	561	J
SELENIUM, SPLP	UG/L	2.6	UJ	2.6	UJ	2.6	UJ
SILVER, SPLP	UG/L	0.5	UJ	0.5	UJ	0.5	UJ
SODIUM, SPLP	UG/L	1620	=	953	J	1440	=
THALLIUM, SPLP	UG/L	3.2	UJ	3.2	UJ	3.2	UJ
Tin (Sn), SPLP	UG/L	2.8	U	2.8	U	2.8	U
VANADIUM, SPLP	UG/L	13.5	=	10.1	=	23.4	=
ZINC, SPLP	UG/L	18.9	U	51.1	=	18.1	U

	StationID	K164SB001		K164SB001		K164SB002		K164SB002	
	SampleID	164SB001T1 (0-1ft)		164SB001T2 (3-5ft)		164SB002T1 (0-1ft)		164SB002T2 (3-5ft)	
	DateCollected	10/12/1999		10/12/1999		10/12/1999		10/12/1999	
	DateAnalyzed	10/20/1999		10/20/1999		10/20/1999		10/20/1999	
	SDGNumber	NBCK01		NBCK01		NBCK01		NBCK01	
Parameter	**Units**								
ALUMINUM	MG/KG	8030	=	7900	=	9410	=	9480	=
ANTIMONY	MG/KG	0.21	UJ	0.22	UJ	0.33	J	0.19	UJ
ARSENIC	MG/KG	1.6	=	1.1	J	21.9	=	38.5	=
BARIUM	MG/KG	21.4	=	8.6	=	21.3	=	11.6	=
BERYLLIUM	MG/KG	0.07	J	0.06	J	0.16	J	0.03	J
CADMIUM	MG/KG	1.1	=	0.05	UJ	1.4	=	0.1	J
CALCIUM	MG/KG	3710	J	566	J	13900	J	2160	J
CHROMIUM, TOTAL	MG/KG	8.5	=	5.8	=	14.4	=	9.6	=
COBALT	MG/KG	0.63	J	0.18	J	1.4	=	0.56	J
COPPER	MG/KG	3.9	=	0.59	J	8.1	=	1.9	J
IRON	MG/KG	3610	=	1430	=	3370	=	2070	=
LEAD	MG/KG	16.2	=	6.2	=	36.5	=	8.9	=
MAGNESIUM	MG/KG	315	=	144	=	414	=	227	=
MANGANESE	MG/KG	15.1	=	9.6	=	24	=	7.7	=
MERCURY	MG/KG	0.04	=	0.02	=	0.05	=	0.04	=
NICKEL	MG/KG	2.4	J	1.6	J	6.3	=	3.8	J
POTASSIUM	MG/KG	126	=	71.5	J	246	=	135	=
SELENIUM	MG/KG	0.31	U	0.31	U	0.49	J	0.28	U
SILVER	MG/KG	0.06	UJ	0.06	UJ	0.05	UJ	0.05	UJ
SODIUM	MG/KG	42.2	J	13.7	U	308	=	53.9	J
THALLIUM	MG/KG	0.38	UJ	0.39	UJ	0.34	UJ	0.35	UJ
Tin (Sn)	MG/KG	2.8	U	2	U	2	U	1.9	U
VANADIUM	MG/KG	10.2	=	7.4	=	15.2	=	12.5	=
ZINC	MG/KG	34.1	J	5.5	J	86.7	J	15.1	J

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB005		K164SB006		K164SB006		K164SB015	
	SampleID	164SB005T2 (3-5ft)		164SB006T1 (0-1ft)		164SB006T2 (3-5ft)		164SB01501 (0-1ft)	
	DateCollected	10/12/1999		10/12/1999		10/12/1999		11/18/1999	
	DateAnalyzed	10/20/1999		10/20/1999		10/20/1999		11/27/1999	
	SDGNumber	NBCK01		NBCK01		NBCK01		NBCK08	
Parameter	**Units**								
ALUMINUM	MG/KG	8160	=	7390	=	6520	=	5430	=
ANTIMONY	MG/KG	0.21	UJ	0.2	UJ	0.2	UJ	0.21	U
ARSENIC	MG/KG	1.1	J	2.3	=	0.84	J	1.5	=
BARIUM	MG/KG	13.2	=	15.1	=	8.6	=	12.8	=
BERYLLIUM	MG/KG	0.05	J	0.05	J	0.01	UJ	0.12	J
CADMIUM	MG/KG	0.06	J	0.51	J	0.05	UJ	2.1	=
CALCIUM	MG/KG	1500	J	2090	J	461	J	1560	=
CHROMIUM, TOTAL	MG/KG	6.5	=	9.7	=	6.8	=	7.6	=
COBALT	MG/KG	0.58	J	0.76	J	0.36	J	0.74	J
COPPER	MG/KG	1.4	J	6.6	=	2.6	=	5.8	=
IRON	MG/KG	1700	=	2440	=	1160	=	1900	=
LEAD	MG/KG	14.7	=	57	=	9.6	=	25.2	=
MAGNESIUM	MG/KG	255	=	232	=	225	=	244	=
MANGANESE	MG/KG	10.7	=	15.7	=	10.9	=	10.8	=
MERCURY	MG/KG	0.05	=	0.04	=	0.02	J	0.02	=
NICKEL	MG/KG	2.1	J	3.2	J	1.4	J	2.7	J
POTASSIUM	MG/KG	163	=	135	=	168	=	149	=
SELENIUM	MG/KG	0.3	U	0.29	U	0.3	U	0.31	U
SILVER	MG/KG	0.06	UJ	0.06	UJ	0.06	UJ	0.06	U
SODIUM	MG/KG	24.3	J	34.1	J	26	J	60.2	U
THALLIUM	MG/KG	0.37	UJ	0.36	UJ	0.36	UJ	0.38	U
Tin (Sn)	MG/KG	1.8	U	2.4	U	2	U	2.1	U
VANADIUM	MG/KG	8.2	=	8.6	=	9.2	=	7.6	=
ZINC	MG/KG	17.2	J	73	J	9.6	J	141	=

	StationID	K164SB016		K164SB016		K164SB017		K164SB017	
	SampleID	164SB01601 (0-1ft)		164SB01602 (3-5ft)		164SB01701 (0-1ft)		164SB01702 (3-5ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	11/26/1999		11/26/1999		11/26/1999		11/26/1999	
	SDGNumber	NBCK06		NBCK06		NBCK06		NBCK06	
Parameter	**Units**								
ALUMINUM	MG/KG	9580	=	12600	=	6230	=	4240	=
ANTIMONY	MG/KG	0.21	U	0.2	U	0.2	U	0.22	U
ARSENIC	MG/KG	3	=	1.4	=	3.4	=	2.3	=
BARIUM	MG/KG	18.5	=	13	=	19.9	=	3	=
BERYLLIUM	MG/KG	0.15	J	0.17	J	0.47	=	0.04	J
CADMIUM	MG/KG	0.26	J	0.05	U	0.19	J	0.04	U
CALCIUM	MG/KG	4220	=	238	=	14900	=	78.2	=
CHROMIUM, TOTAL	MG/KG	11.8	=	10.3	=	9.8	=	5.4	=
COBALT	MG/KG	0.86	J	0.71	J	0.9	J	0.19	J
COPPER	MG/KG	3.9	=	0.57	J	1.8	J	0.22	J
IRON	MG/KG	3760	=	2990	=	3310	=	1290	=
LEAD	MG/KG	66	J	9.4	J	6.9	J	2.4	J
MAGNESIUM	MG/KG	330	=	309	=	276	=	59.7	=
MANGANESE	MG/KG	14.8	=	7.2	=	14.1	=	3.8	=
MERCURY	MG/KG	0.05	=	0.05	=	0.03	=	0.03	=
NICKEL	MG/KG	4.1	J	3.5	J	4.4	J	1.8	J
POTASSIUM	MG/KG	150	=	169	=	173	=	48.6	J
SELENIUM	MG/KG	0.3	U	0.32	U	0.54	J	0.28	U
SILVER	MG/KG	0.06	U	0.06	U	0.06	U	0.05	U
SODIUM	MG/KG	92	U	36.8	U	271	=	24.2	U
THALLIUM	MG/KG	0.37	U	0.4	U	0.36	U	0.35	U
Tin (Sn)	MG/KG	2.9	U	2.2	U	1.8	U	2	U
VANADIUM	MG/KG	14.1	=	15.9	=	13.9	=	9 2	=
ZINC	MG/KG	45.9	J	7.6	U	10.2	J	1.6	U

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB018		K164SB018		K164SB019		K164SB019	
	SampleID	164SB01801 (0-1ft)		164SB01802 (3-5ft)		164SB01901 (0-1ft)		164SB01902 (3-5ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	11/26/1999		11/26/1999		11/26/1999		11/26/1999	
	SDGNumber	NBCK06		NBCK06		NBCK06		NBCK06	
Parameter	**Units**								
ALUMINUM	MG/KG	7260	=	4950	=	8680	=	6310	=
ANTIMONY	MG/KG	0.2	U	0.21	U	0.19	U	0.16	U
ARSENIC	MG/KG	18.5	=	0.64	J	1.2	=	0.72	J
BARIUM	MG/KG	13.8	=	4.2	=	13.3	=	5.7	=
BERYLLIUM	MG/KG	0.13	J	0.04	J	0.05	J	0.05	J
CADMIUM	MG/KG	0.35	J	0.04	U	0.04	U	0.04	U
CALCIUM	MG/KG	4530	=	33.4	J	112	=	39.9	J
CHROMIUM, TOTAL	MG/KG	8.4	=	4.2	=	7.5	=	6.5	=
COBALT	MG/KG	0.49	J	0.46	J	0.28	J	0.46	J
COPPER	MG/KG	3	=	0.25	J	0.61	J	0.4	J
IRON	MG/KG	3630	=	2600	=	4820	=	3540	=
LEAD	MG/KG	12.8	J	3.5	J	5	J	3.8	J
MAGNESIUM	MG/KG	225	=	88.7	=	195	=	133	=
MANGANESE	MG/KG	12.2	=	4.1	=	11.6	=	7.8	=
MERCURY	MG/KG	0.02	=	0.01	J	0.03	=	0.01	J
NICKEL	MG/KG	3	J	2.5	J	3.1	J	3.6	J
POTASSIUM	MG/KG	125	=	66.7	J	98.2	J	79.3	J
SELENIUM	MG/KG	0.28	U	0.28	U	0.28	U	0.29	U
SILVER	MG/KG	0.05	U	0.06	J	0.05	U	0.05	U
SODIUM	MG/KG	133	=	31.5	U	24.8	U	17.2	U
THALLIUM	MG/KG	0.35	U	0.34	U	0.36	J	0.35	U
Tin (Sn)	MG/KG	2.2	U	2	U	2	U	2.4	U
VANADIUM	MG/KG	11.8	=	7.3	=	11.8	=	7.7	=
ZINC	MG/KG	467	J	16.2	J	4.5	U	3.5	U

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB020		K164SB020		K164SB021		K164SB021	
	SampleID	164SB02001 (0-1ft)		164SB02002 (3-5ft)		164SB02101 (0-1ft)		164SB02102 (3-5ft)	
	DateCollected	11/18/1999		11/18/1999		11/18/1999		11/18/1999	
	DateAnalyzed	11/26/1999		11/26/1999		11/26/1999		11/26/1999	
	SDGNumber	NBCK06		NBCK06		NBCK07		NBCK07	
Parameter	**Units**								
ALUMINUM	MG/KG	7010	=	8790	=	10400	=	7420	=
ANTIMONY	MG/KG	0.18	U	0.18	U	0.43	J	0.21	U
ARSENIC	MG/KG	1.2	=	1.9	=	1.4	=	1.6	=
BARIUM	MG/KG	8.5	=	4.6	=	16.3	=	6.9	=
BERYLLIUM	MG/KG	0.05	J	0.06	J	0.17	J	0.12	J
CADMIUM	MG/KG	0.04	U	0.04	U	0.24	J	0.05	U
CALCIUM	MG/KG	305	=	36.1	J	339	=	75.1	=
CHROMIUM, TOTAL	MG/KG	5.8	=	7.4	=	7.7	J	7.2	J
COBALT	MG/KG	0.14	J	0.43	J	0.65	J	0.54	J
COPPER	MG/KG	2.4	=	0.38	J	5.3	=	1.1	J
IRON	MG/KG	4200	=	4330	=	2610	=	2140	=
LEAD	MG/KG	7.6	J	3.5	J	18.6	=	5.2	=
MAGNESIUM	MG/KG	125	=	128	=	242	J	191	J
MANGANESE	MG/KG	6.8	=	6.3	=	11.2	J	6.3	J
MERCURY	MG/KG	0.03	=	0.02	J	0.03	=	0.02	=
NICKEL	MG/KG	2	J	3	J	2.7	J	2.2	J
POTASSIUM	MG/KG	62.6	J	74	J	98.8	J	90.6	J
SELENIUM	MG/KG	0.26	U	0.26	U	0.44	J	0.31	U
SILVER	MG/KG	0.05	U	0.05	U	0.05	U	0.06	U
SODIUM	MG/KG	32.2	U	11.2	U	42.8	UJ	22.6	UJ
THALLIUM	MG/KG	0.32	U	0.32	U	0.35	U	0.5	J
Tin (Sn)	MG/KG	1.9	U	1.9	U	2.4	U	2.2	U
VANADIUM	MG/KG	10.2	=	16.3	=	11	=	11.4	=
ZINC	MG/KG	6.3	U	3.6	U	24.3	J	5.7	J

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB022		K164SB022		K164SB023		K164SB023	
	SampleID	164SB02201 (0-1ft)		164SB02202 (3-5ft)		164SB02301 (0-1ft)		164SB02302 (3-5ft)	
	DateCollected	12/22/1999		12/22/1999		12/22/1999		12/22/1999	
	DateAnalyzed	01/10/2000		01/10/2000		01/10/2000		01/10/2000	
	SDGNumber	41577		41577		41577		41577	
Parameter	**Units**								
ALUMINUM	MG/KG	7560	=	9520	=	4970	=	12200	=
ANTIMONY	MG/KG	0.48	J	0.32	U	0.29	U	0.32	U
ARSENIC	MG/KG	7.2	=	1.2	J	1.6	=	1	J
BARIUM	MG/KG	14.5	=	7.6	=	13.3	=	13	=
BERYLLIUM	MG/KG	0.16	J	0.13	J	0.17	J	0.14	J
CADMIUM	MG/KG	2.4	J	0.17	J	0.13	J	0.04	U
CALCIUM	MG/KG	2830	=	254	J	4400	=	191	J
CHROMIUM, TOTAL	MG/KG	12.5	=	8.5	=	6.1	=	9.1	=
COBALT	MG/KG	1.1	J	1.1	J	0.66	J	0.83	J
COPPER	MG/KG	9.7	=	1.7	J	2	J	0.59	J
IRON	MG/KG	4510	=	4640	=	2310	=	1770	=
LEAD	MG/KG	42.1	=	5	=	16.7	=	5.7	=
MAGNESIUM	MG/KG	315	=	292	=	178	=	369	=
MANGANESE	MG/KG	17.3	=	8.6	=	12.9	=	8.1	=
MERCURY	MG/KG	0.04	=	0.03	J	0.04	=	0.06	=
NICKEL	MG/KG	3.8	J	3.9	J	2.7	J	3	J
POTASSIUM	MG/KG	151	J	146	J	114	J	173	J
SELENIUM	MG/KG	0.52	J	0.39	U	0.36	U	0.39	U
SILVER	MG/KG	0.13	U	0.14	U	0.13	U	0.14	U
SODIUM	MG/KG	280	J	277	J	282	J	286	J
THALLIUM	MG/KG	0.38	U	0.46	J	0.37	U	0.52	J
Tin (Sn)	MG/KG	3.8	U	3.9	U	3.7	U	4.1	U
VANADIUM	MG/KG	12.9	=	11.9	=	8	=	12.4	=
ZINC	MG/KG	95.4	=	9.6	=	21	=	4.9	=

	StationID	K164SB024		K164SB024		K164SB034		K164SB034	
	SampleID	164SB02401 (0-1ft)		164SB02402 (3-5ft)		164SB03401 (0-1ft)		164SB03402 (3-5ft)	
	DateCollected	12/22/1999		12/22/1999		12/22/1999		12/22/1999	
	DateAnalyzed	01/10/2000		01/10/2000		01/10/2000		01/10/2000	
	SDGNumber	41577		41577		41577		41577	
Parameter	**Units**								
ALUMINUM	MG/KG	4630	=	9700	=	8630	=	5510	=
ANTIMONY	MG/KG	0.45	J	0.32	U	0.38	J	0.29	U
ARSENIC	MG/KG	2.3	=	2	=	1.5	=	0.68	J
BARIUM	MG/KG	17.5	=	6.4	=	9.8	=	3.2	=
BERYLLIUM	MG/KG	0.51	J	0.11	J	0.16	J	0.09	U
CADMIUM	MG/KG	0.18	J	0.04	U	0.06	J	0.03	U
CALCIUM	MG/KG	17000	=	120	J	471	J	75.8	J
CHROMIUM, TOTAL	MG/KG	10.7	=	11.2	=	6.6	=	4.8	=
COBALT	MG/KG	1.8	J	0.51	J	0.37	J	0.62	J
COPPER	MG/KG	2.4	J	0.61	J	0.89	J	0.58	J
IRON	MG/KG	2080	=	1930	=	4700	=	2020	=
LEAD	MG/KG	6.1	=	4.8	=	7.3	=	2.6	=
MAGNESIUM	MG/KG	279	=	173	=	210	=	98.1	=
MANGANESE	MG/KG	17.4	=	4.4	=	13.9	=	4.3	=
MERCURY	MG/KG	0.04	=	0.07	=	0.06	=	0.02	J
NICKEL	MG/KG	3.2	J	2.9	J	3	J	2.9	J
POTASSIUM	MG/KG	181	J	101	J	94.3	J	50.9	J
SELENIUM	MG/KG	0.37	U	0.39	U	0.41	J	0.36	U
SILVER	MG/KG	0.14	U	0.14	U	0.13	U	0.13	U
SODIUM	MG/KG	627	=	237	J	241	J	212	J
THALLIUM	MG/KG	0.38	U	0.44	J	0.36	U	0.57	J
Tin (Sn)	MG/KG	3.7	U	3.9	U	3.6	U	3.7	U
VANADIUM	MG/KG	10.8	=	17.1	=	11.3	=	7.7	=
ZINC	MG/KG	15	=	3.1	=	4.2	=	3	=

Charleston Naval Complex
SWMU 164, Zone K

	StationID	K164SB035		K164SB035	
	SampleID	164SB03501 (0-1ft)		164SB03502 (3-5ft)	
	DateCollected	01/17/2000		01/17/2000	
	DateAnalyzed	01/24/2000		01/24/2000	
	SDGNumber	41772		41772	
Parameter	Units				
ALUMINUM	MG/KG	6910	=	5030	=
ANTIMONY	MG/KG	0.37	UJ	0.31	UJ
ARSENIC	MG/KG	2.8	=	0.23	J
BARIUM	MG/KG	10.3	=	4.1	=
BERYLLIUM	MG/KG	0.09	U	0.09	U
CADMIUM	MG/KG	0.59	J	0.59	J
CALCIUM	MG/KG	1940	=	447	J
CHROMIUM, TOTAL	MG/KG	7.2	=	4.1	=
COBALT	MG/KG	0.41	J	0.26	J
COPPER	MG/KG	2.5	J	0.99	U
IRON	MG/KG	6760	=	845	=
LEAD	MG/KG	18.7	=	6	=
MAGNESIUM	MG/KG	228	=	117	=
MANGANESE	MG/KG	10.7	=	3	=
MERCURY	MG/KG	0.05	J	0.03	J
NICKEL	MG/KG	2.3	J	1.5	J
POTASSIUM	MG/KG	70.2	J	57.7	J
SELENIUM	MG/KG	0.72	=	0.53	J
SILVER	MG/KG	0.13	U	0.14	U
SODIUM	MG/KG	205	J	186	J
THALLIUM	MG/KG	0.38	U	0.39	U
Tin (Sn)	MG/KG	4.2	U	4	U
VANADIUM	MG/KG	12.1	=	3.6	=
ZINC	MG/KG	46.1	J	3.3	J

	StationID	K164SB001		K164SB001		K164SB002		K164SB002	
	SampleID	164SB001T1 (0-1ft)		164SB001T2 (3-5ft)		164SB002T1 (0-1ft)		164SB002T2 (3-5ft)	
	DateCollected	10/12/1999		10/12/1999		10/12/1999		10/12/1999	
	DateAnalyzed	10/18/1999		10/18/1999		10/18/1999		10/18/1999	
	SDGNumber	NBCK01		NBCK01		NBCK01		NBCK01	
Parameter	**Units**								
TOTAL ORGANIC CARBON	MG/KG	26000	=	17000	=	18000	=	9000	=

	StationID	K164SB004		K164SB004		K164SB005		K164SB006	
	SampleID	164SB004T1 (0-1ft)		164SB004T2 (3-5ft)		164SB005T2 (3-5ft)		164SB006T1 (0-1ft)	
	DateCollected	10/12/1999		10/12/1999		10/12/1999		10/12/1999	
	DateAnalyzed	10/18/1999		10/19/1999		10/18/1999		10/18/1999	
	SDGNumber	NBCK01		NBCK01		NBCK01		NBCK01	
Parameter	**Units**								
TOTAL ORGANIC CARBON	MG/KG	9600	=	2100	=	7400	=	11000	=

	StationID	K164SB006	
	SampleID	164SB006T2 (3-5ft)	
	DateCollected	10/12/1999	
	DateAnalyzed	10/18/1999	
	SDGNumber	NBCK01	
Parameter	**Units**		
TOTAL ORGANIC CARBON	MG/KG	4000	=

U	Undetected. Samples were analyzed for this analyte, but it was not detected above the method detection limit (MDL).
UJ	Detection limit estimated. Samples were analyzed for this analyte, but the results were qualified as not detected. The result is estimated.
J	Estimated. The analyte was present, but the reported value may not be accurate or precise.
R	Rejected. The data are unusable. (NOTE: Analyte/compound may or may not be present.)
=	Detected. Target parameter detected at the concentration reported.

APPENDIX B

Validation Reports from the EnSafe RFI Investigation (1999)

DATA VALIDATION REPORT
ZONE K
SDG #NBCK09

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	NBCK09
Date:	January 12, 2000
Client Name:	Ensafe
Project/Site Name:	Charleston Zone K
Date Sampled:	November 19, 1999
Number of Samples:	34 Non-Aqueous Sample(s) with 0 MS/MSD(s) 4 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Sugar — 1-12-00.

for Paul B. Humburg, President — Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# NBCK09

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	VOA		SVOA		PEST		MET	
164SB03001	SOIL		X		X				
164TB03001	WATER	X							
164EB03001	WATER	X		X		X		X	
164FB03001	WATER	X		X		X		X	
164DB03001	WATER	X		X		X		X	
164SB03002	SOIL		X		X				
164SB03101	SOIL		X		X				
164SB03102	SOIL		X		X				
164SB03201	SOIL		X		X				
164SB03202	SOIL		X		X				
698SB03001	SOIL		X						
698CB03001	SOIL		X						
698SB03002	SOIL		X						
698SB03101	SOIL		X						
698SB03102	SOIL		X						
698SB03201	SOIL		X						
698SB03202	SOIL		X						
698SB02301	SOIL				X				X
698CB02301	SOIL				X				X
698SB02302	SOIL				X				X
698SB02401	SOIL				X				
698SB02402	SOIL				X				
698SB02101	SOIL								X
698SB02102	SOIL								X
698SB02201	SOIL								X
698SB02202	SOIL								X
698SB02501	SOIL								X
698CB02501	SOIL								X
698SB02502	SOIL								X
698SB02601	SOIL								X
698SB02602	SOIL								X
698SB02701	SOIL								X
698SB02702	SOIL								X
698SB02801	SOIL								X
698SB02802	SOIL								X
698SB02901	SOIL								X
698CB02901	SOIL								X
698SB02902	SOIL								X
Total Billable Samples (Water/Soil)		4	13	3	11	3	0	3	19

VOA= Volatiles
SVOA= Semivolatiles
PEST= Pesticides
MET= Metals

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260; the National Functional Guidelines for Organic Data Validation, 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK09

A validation was performed on the Volatile Data from SDG NBCK09. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Internal Standard Performance
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter

Blanks

Blank ID	Compound	Conc.	Action Limit (10X)
1M1209MB	acetone	18	180
164TB03001	acetone	29	290
164EB03001	acetone	28	280
164FB03001	acetone	25	250
164DB03001	acetone	25	250

Data Assessment Narrative
Page - 2
Volatiles

Sample ID	Compound	Conc.	Qualifier	Assoc. Blank
164SB03101	acetone	10JB	11U	1M1209MB
164SB03201	acetone	41	U	164TB03001
698SB03001		34	U	
698CB03001		58	U	
698SB03101		120	U	
698SB03201		33	U	
698SB03202		9.6	U	

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
164SB03101	acetone	+BJ	CRQL
164SB03201	acetone	+	U
698SB03001			
698CB03001			
698SB03101			
698SB03201			
698SB03202			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270; the National Functional Guidelines for Organic Data Validation, 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK09

A validation was performed on the Semivolatile Data from SDG NBCK09 The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • GC/MS Tuning
* • Calibration
* • Blanks
* • Surrogate Recoveries
* • Matrix Spike/Matrix Spike Duplicates
* • Field Duplicates
* • Internal Standard Performance
* • Compound Identification
* • Compound Quantitation

* - All criteria were met for this parameter.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

No qualifications are required.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846, Method 8081/8082; the National Functional Guidelines for Organic Data Review, February 1994, where applicable and DQO Level III. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # NBCK09

A validation was performed on the Pesticide/PCB Data from SDG NBCK09. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
*	•	GC Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D= result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL

No qualifications are required since all samples are field QC blanks.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # NBCK09

A validation was performed on the Metals Data from SDG NCBK09. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	4.46 mg/kg	no impact
Calcium	1.60 mg/kg	no impact
Potassium	3.56 mg/kg	no impact
Sodium	13.6 mg/kg	all soil samples below 68.0 mg/kg
Tin	1.72 mg/kg	all soil samples below 8.6 mg/kg
Zinc	1.28 mg/kg	all soil samples below 6.4 mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

The preparation blanks exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Selenium	-0.53 mg/kg	all soil samples below 5.3 mg/kg
Thallium	-0.56 mg/kg	all soil samples below 5.6 mg/kg

This reviewer qualifies all samples results below 10 times the absolute value of the negative blank value.

Matrix Spike Recovery results

The matrix spike recovery result for soils for Calcium (142%) was above the upper control limits (>125%). All positive results are qualified as estimated, "J".

Matrix Duplicate RPD results

The RPD for soils for Calcium (23%) was not greater than 35%. No qualification is necessary is required.

Field Duplicate RPD results

The RPD for samples 698SB02301 and 698CB02301 for Calcium (78%) was greater than 50%. All positive and non-detect results are qualified as estimated, "J" or "UJ".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 68.0 mg/kg	Na.	+	U
all soil samples below 8.6 mg/kg	Sn.		
all soil samples below 6.4 mg/kg	Zn.		
all soil samples below 5.3 mg/kg	Se.	+/U	J/UJ
all soil samples below 5.6 mg/kg	Tl.		
all soil samples	Ca.	+	J
698SB02301 and 698CB02301	Ca.	+/U	J/UJ
all "B" results	all analytes	B	J

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 2
PROJECT/JOB NO: 2911-001 20-00
COC NO:
PO NO: 2
REL NO. 82
LAB NAME: Savannah

CLIENT: Navy Clean
LOCATION: Zone K
SAMPLERS. (SIGNATURE): S. Parker
PROJECT MANAGER: S. Parker
TELE/FAX NO: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	VOC	SVOC	Metals								REMARKS
KKE/164SB03001	11-19-99	0950	S	4oz 189/ENCore	4°	—	3	X	X									
/164SB03002	11-19-99	0955	S	"	4°	—	3	X	X									
164TB03001	"	0945	W	"	4°	—	3	X										TRIP BLK
164SB03201	"	0955	S	"	4°	—	3	X	X									
164SB03202	"	1000	S	"	"	—	3	X	X									
164SB03101	"	1000	S	"	"	—	3	X	X									
164SB03102	"	1005	S	"	"	—	3	X	X									
698SB02201	"	1020	S	8oz Plastic	"	—	1			X								
698SB02202	"	1025	S	"	"	—	1			X								
698SB02101	"	1020	S	"	"	—	1			X								
698SB02102	"	1025	S	"	"	—	1			X								
698SB02301	"	1030	S	8oz Glass/Plast	"	—	2		X	X								
698CB02301	"	1030	S	"	"	—	2		X	X								
698SB02302	"	1035	S	"	"	—	2		X	X								
698SB02401	"	1030	S	8oz Glass	"	—	1		X									
698SB02402	"	1035	S	"	"	—	1		X									

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
S. Parker	11-19-99	[illegible]	11/20/99				
PRINTED: S. Parker	TIME: 1500	PRINTED: [illegible]	TIME: 11:00	PRINTED:	TIME	PRINTED:	TIME
COMPANY: EnSafe		COMPANY: STL SBV		COMPANY:		COMPANY	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO: 814795922121
SHIPMENT DELIVERS TO:

COMMENTS: 21 Day TAT

FINAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 2 OF 2

PROJECT/JOB NO: 2911-001- 00
COC NO:
PO NO: 2
REL NO. 82
LAB NAME: Savannah

CLIENT: Navy CLEAN
LOCATION: Zone K
SAMPLERS (SIGNATURE): [signature]

PROJECT MANAGER: S. Parker
TELE/FAX NO: 843-884-0029/886-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	Semi-VOC	Metals	REMARKS
698SB03101	11-14-99	1100	S	4 oz Glass	4°	—	1	X			
698SB03102	"	1105	S	"	4°	—	1	X			
698SB03201	"	1105	S	"	4°	—	1	X			
698SB03202	"	1110	S	"	4°	—	1	X			
698SB03001	"	1115	S	"	4°	—	1	X			
698CB03001	"	1115	S	"	4°	—	1	X			
698SB03002	"	1120	S	"	4°	—	1	X			
698SB02901	"	1135	S	8 oz Plastic	4°	—	1		X		
698SB02902	"	1140	S	"	4°	—	1		X		
698SB02601	"	1145	S	"	4°	—	1		X		
698SB02602	"	1150	S	"	4°	—	1		X		
698SB02701	"	1150	S	"	4°	—	1		X		
698SB02702	"	1155	S	"	4°	—	1		X		
698CB02901	"	1135	S	"	4°	—	1		X		
698SB02501	"	1150	S	"	4°	—	1		X		
698CB02501	"	1150	S	"	4°	—	1		X		
698SB02502	"	1155	S	"	4°	—	1		X		

RELINQUISHER: [signature]	DATE: 11-14-99	RECEIVER: C. Vasquez	DATE: 11/20/99	RELINQUISHER:	DATE:	RECEIVER:	DATE:
PRINTED: S. Parker	TIME: 1500	PRINTED: C. Vasquez	TIME: 11:00	PRINTED:	TIME:	PRINTED:	TIME:
COMPANY: EnSafe		COMPANY: SIL-SAV		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fedex
SHIPMENT NO.: 814795922121
SHIPPED TO:

COMMENTS:

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE): [illegible]

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

PROJECT/JOB NO: 2911-001- 110-00
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: Navy Clean
LOCATION: Zone K
SAMPLERS (SIGNATURE): S. Parker

PROJECT MANAGER: S. Parker
TELE/FAX NO.: 843-884-0027/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Pest/PCB	Metals						REMARKS
1:4/164EB03001	11-19-99	1300	W	40ml/500ml 1L Amber	4°	HNO3 HCL	6	X	X	X	X						Equip Blank
164FB03001	"	"	W	"	4°	"	6	X	X	X	X						Field Blank
164DB03001	"	"	W	"	4°	"	6	X	X	X	X						DI Blank

11-19-99

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
S. Parker	11-19-99	C. Vaughn	11/20/99				
PRINTED S. Parker	TIME 1500	PRINTED Stc. Vasquez	TIME 11:00	PRINTED	TIME	PRINTED	TIME
COMPANY EnSafe		COMPANY STL-SAV		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO.: 814 795 922 121
RESULTS TO: S. Parker

COMMENTS: 21 Day TAT

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 2
PROJECT/JOB NO. 2911-00, 9-000-00
COC NO:
PO NO. 2
REL NO: 82
LAB NAME: Savannah

CLIENT: NAVY CLEAN
LOCATION: ZONE K
SAMPLERS (SIGNATURE): S. PARKER
PROJECT MANAGER: S. PARKER
TELE/FAX NO: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Metals									REMARKS
AKE/164SB03001	11-19-99	0950	S	4oz Gl/ENCore	4°	—	3	X	X										
/164SB03002	11-19-99	0955	S	"	4°	—	3	X	X										
164TB03001	"	0945	WS	"	4°	—	3	X											TRIP BLK
164SB03201	"	0955	S	"	4°	—	3	X	X										
164SB03202	"	1000	S	"	"	—	3	X	X										
164SB03101	"	1000	S	"	"	—	3	X	X										
164SB03102	"	1005	S	"	"	—	3	X	X										
698SB02201	"	1020	S	8oz Plastic	"	—	1			X									
698SB02202	"	1025	S	"	"	—	1			X									
698SB02101	"	1020	S	"	"	—	1			X									
698SB02102	"	1025	S	"	"	—	1			X									
698SB02301	"	1030	S	8oz Glass/Plast	"	—	2		X	X									
698CB02301	"	1030	S	"	"	—	2		X	X									
698SB02302	"	1035	S	"	"	—	2		X	X									
698SB02401	"	1030	S	8oz Glass	"	—	1		X										
698SB02402	"	1035	S	"	"	—	1		X										

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
S. PARKER	11-19-99	[illegible]	11/20/99				
PRINTED S. PARKER	TIME 1500	PRINTED [illegible]	TIME 1100	PRINTED	TIME	PRINTED	TIME
COMPANY ENSAFE		COMPANY [illegible] SAV		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO.: 814795922121
SEND RESULTS TO:

COMMENTS: 21 Day TAT

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 2 OF 2
PROJECT/JOB NO: 2911-001 -000-00
COC NO:
PO NO. 2
REL NO. 82
LAB NAME: Savannah

CLIENT: Navy Clean
LOCATION: Zone K
SAMPLERS (SIGNATURE):
PROJECT MANAGER: S. Parker
TELE/FAX NO. 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOCs	Metals	REMARKS
MRK/698SB03101	11-19-99	1100	S	4 oz Glass	4°	—	1	X			
/698SB03102	"	1105	S	"	4°	—	1	X			
698SB03201	"	1105	S	"	4°	—	1	X			
698SB03202	"	1110	S	"	4°	—	1	X			
698SB03001	"	1115	S	"	4°	—	1	X			
698CB03001	"	1115	S	"	4°	—	1	X			
698SB03002	"	1120	S	"	4°	—	1	X			
698SB02901	"	1135	S	8 oz Plastic	4°	—	1		X		
698SB02902	"	1140	S	"	4°	—	1		X		
698SB02601	"	1145	S	"	4°	—	1		X		
698SB02602	"	1150	S	"	4°	—	1		X		
698SB02701	"	1150	S	"	4°	—	1		X		
698SB02702	"	1155	S	"	4°	—	1		X		
698CB02901	"	1135	S	"	4°	—	1		X		
698SB02501	"	1150	S	"	4°	—	1		X		
698CB02501	"	1150	S	"	4°	—	1		X		
698SB02502	"	1155	S	"	4°	—	1		X		

RELINQUISHER		DATE 11-19-99	RECEIVER		DATE 11/20/99	RELINQUISHER	DATE	RECEIVER	DATE
PRINTED	S. Parker	TIME 1500	PRINTED		TIME 11:00	PRINTED	TIME	PRINTED	TIME
COMPANY	EnSafe		COMPANY	SPL-SAV		COMPANY		COMPANY	

METHOD OF SHIPMENT: Fedex
SHIPMENT NO. 814775922121
SAMPLE RESULTS TO.

COMMENTS:

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1
PROJECT/JOB NO: 2911-001 -000-00
COC NO.
PO NO: 2
REL NO. 82
LAB NAME. Savannah

CLIENT: NAVY CLEAN
PROJECT MANAGER: S. PARKER
LOCATION: ZONE K
TELE/FAX NO: 843-884-0027/856-0107
SAMPLERS. (SIGNATURE): PARKER

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Pest/PCB	Metals							REMARKS
164EB03001	11-19-99	1300	W	40ml/500ml 1L Amber	4°	HNO3 HCL	6	X	X	X	X							Equip Blank
164FB03001	"	"	W	"	4°	"	6	X	X	X	X							Field Blank
164DB03001	"	"	W	"	4°	"	6	X	X	X	X							DI Blank

11-19-99

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER:	DATE
S. PARKER	11-19-99	PRINTED SFC P. Vasquez	11/20/99	PRINTED		PRINTED.	
ENSAFE	TIME 1500	COMPANY STC USRY	TIME 11:00	COMPANY.	TIME	COMPANY.	TIME

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO: 814795 922 121
SEND RESULTS TO: S. Parker

COMMENTS: 21 Day TAT

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE) 12/7/99

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 5
PROJECT/JOB NO: 2911-001 -000-00
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: NAVY CLEAN
LOCATION: ZONE K
SAMPLERS (SIGNATURE): S. PARKER
PROJECT MANAGER: S. PARKER
TELE/FAX NO.: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Metals									REMARKS
NKK/164SB03001	11-19-99	0950	S	4oz 8oz/EnCore	4°	—	3	X	X										
/164SB03002	11-19-99	0955	S	"	4°	—	3	X	X										
164TB03001	"	0945	WS	"	4°	—	3	X											TRIP BLK
164SB03201	"	0955	S	"	4°	—	3	X	X										
164SB03202	"	1000	S	"	"	—	3	X	X										
164SB03101	"	1000	S	"	"	—	3	X	X										
164SB03102	"	1005	S	"	"	—	3	X	X										
698SB02201	"	1020	S	8oz Plastic	"	—	1			X									
698SB02202	"	1025	S	"	"	—	1			X									
698SB02101	"	1020	S	"	"	—	1			X									
698SB02102	"	1025	S	"	"	—	1			X									
698SB02301	"	1030	S	8oz Glass/Plast	"	—	2		X	X									
698CB02301	"	1030	S	"	"	—	2		X	X									
698SB02302	"	1035	S	"	"	—	2		X	X									
698SB02401	"	1030	S	8oz Glass	"	—	1		X										
698SB02402	"	1035	S	"	"	—	1		X										

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
S. PARKER	11-19-99	L. Vasquez	11/20/99				
PRINTED: S. PARKER	TIME 1500	PRINTED: L. Vasquez	TIME 11:00	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: STL SAV		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO.: 814795922121
SEND RESULTS TO:

COMMENTS: 21 Day TAT

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

PROJECT/JOB NO. 2911-001 000-00

COC NO:

PO NO: 2

REL NO: 82

LAB NAME: Savannah

CLIENT: Navy CLEAN

PROJECT MANAGER: S. Parker

LOCATION: Zone K

TELE/FAX NO. 843-884-0029/856-0107

SAMPLERS (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	VOC	SVOCs	Metals								REMARKS
MW K / 698SB03101	11-19-99	1100	S	4 oz Glass	4°	—	1	X										
/ 698SB03102	"	1105	S	"	4°	—	1	X										
698SB03201	"	1105	S	"	4°	—	1	X										
698SB03202	"	1110	S	"	4°	—	1	X										
698SB03001	"	1115	S	"	4°	—	1	X										
698CB03001	"	1115	S	"	4°	—	1	X										
698SB03002	"	1120	S	"	4°	—	1	X										
698SB02901	"	1135	S	8 oz Plastic	4°	—	1			X								
698SB02902	"	1140	S	"	4°	—	1			X								
698SB02601	"	1145	S	"	4°	—	1			X								
698SB02602	"	1150	S	"	4°	—	1			X								
698SB02701	"	1150	S	"	4°	—	1			X								
698SB02702	"	1155	S	"	4°	—	1			X								
698CB02901	"	1135	S	"	4°	—	1			X								
698SB02501	"	1150	S	"	4°	—	1			X								
698CB02501	"	1150	S	"	4°	—	1			X								
698SB02502	"	1155	S	"	4°	—	1			X								

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
S. Parker	11-19-99	C. Vasquez	11/20/99				
S. Parker	TIME 1500	PRINTED C. Vasquez	TIME 11:00	PRINTED	TIME	PRINTED	TIME
EnSafe		COMPANY SIL-SAV		COMPANY		COMPANY	

METHOD OF SHIPMENT: Fedex

SHIPMENT NO. 814775922/21

SHIPPED TO

COMMENTS:

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1
PROJECT/JOB NO: 2911-801- -000-00
COC NO.
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: NAVY CLEAN
LOCATION: ZONE K
SAMPLERS (SIGNATURE): S. PARKER
PROJECT MANAGER: S. PARKER
TELE/FAX NO: 843-884-0027/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Pest/PCB	Metals							REMARKS
DI Blank/164EB03001	11-19-99	1300	W	40ml/500ml 1L Amber	4°	1/NO3 HCL	6	X	X	X	X							Equip Blank
164FB03001	"	"	W	"	4°	"	6	X	X	X	X							Field Blank
164DB03001	"	"	W	"	4°	"	6	X	X	X	X							DI Blank

11-19-99

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
S. PARKER	11-19-99	C. Vasquez	11/20/99				
PRINTED S. PARKER	TIME 1500	PRINTED S.C. Vasquez	TIME 11:00	PRINTED	TIME	PRINTED	TIME
COMPANY EnSafe		COMPANY STL-SAV		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO.: 814795 222 121
SEND RESULTS TO: S. Parker

COMMENTS: 21 Day TAT

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 5
PROJECT/JOB NO. 2911-00 9000-00
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: NAVY CLEAN
LOCATION: ZONE K
SAMPLERS (SIGNATURE): PARKER
PROJECT MANAGER: S. PARKER
TELE/FAX NO.: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Metals								REMARKS
NKE/164SB03001	11-19-99	0950	S	4oz+8oz/EnCore	4°	—	3	X	X									
/164SB03002	11-19-99	0955	S	"	4°	—	3	X	X									
164TB03001	"	0945	WS	"	4°	—	3	X										TRIP BLK
164SB03201	"	0955	S	"	4°	—	3	X	X									
164SB03202	"	1000	S	"	"	—	3	X	X									
164SB03101	"	1000	S	"	"	—	3	X	X									
164SB03102	"	1005	S	"	"	—	3	X	X									
698SB02201	"	1020	S	8oz Plastic	"	—	1			X								
698SB02202	"	1025	S	"	"	—	1			X								
698SB02101	"	1020	S	"	"	—	1			X								
698SB02102	"	1025	S	"	"	—	1			X								
698SB02301	"	1030	S	8oz Glass/Plast	"	—	2		X	X								
698CB02301	"	1030	S	"	"	—	2		X	X								
698SB02302	"	1035	S	"	"	—	2		X	X								
698SB02401	"	1030	S	8oz Glass	"	—	1		X									
698SB02402	"	1035	S	"	"	—	1		X									

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
S. PARKER	11-19-99		11/20/99				
PRINTED S. PARKER	TIME 1500	PRINTED	TIME 1100	PRINTED	TIME	PRINTED	TIME
COMPANY ENSAFE		COMPANY		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO: 814795922121
SEND RESULTS TO:

COMMENTS: 21 Day TAT

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOCS

EnSAFE

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CHAIN OF CUS. DY RECORD

PROJECT/JOB NO 2941-001 -000-00
COC NO:
PO NO: 2
REL NO. 82
LAB NAME: Savannah

CLIENT Navy CLEAN
LOCATION Zone K
SAMPLERS (SIGNATURE) [signature]

PROJECT MANAGER S. Parker
TELE/FAX NO 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOCs	Metals	REMARKS
MRK 1/698SB03101	11-19-99	1100	S	4 oz Glass	4°	—	1	X			
1/698SB03102	"	1105	S	"	4°	—	1	X			
698SB03201	"	1105	S	"	4°	—	1	X			
698SB03202	"	1110	S	"	4°	—	1	X			
698SB03001	"	1115	S	"	4°	—	1	X			
698CB03001	"	1115	S	"	4°	—	1	X			
698SB03002	"	1120	S	"	4°	—	1	X			
698SB02901	"	1135	S	8 oz Plastic	4°	—	1		X		
698SB02902	"	1140	S	"	4°	—	1		X		
698SB02601	"	1145	S	"	4°	—	1		X		
698SB02602	"	1150	S	"	4°	—	1		X		
698SB02701	"	1150	S	"	4°	—	1		X		
698SB02702	"	1155	S	"	4°	—	1		X		
698CB02901	"	1135	S	"	4°	—	1		X		
698SB02501	"	1150	S	"	4°	—	1		X		
698CB02501	"	1150	S	"							
698SB02502	"	1155	S	"	4°	—	1		X		

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	11-19-99	C. Vasquez	11/20/99				
PRINTED S. Parker	TIME 1500	PRINTED C. Vasquez	TIME 11:00	PRINTED	TIME	PRINTED	TIME
COMPANY EnSafe		COMPANY SIL-SAV		COMPANY		COMPANY	

METHOD OF SHIPMENT Fedex
SHIPMENT NO. 814775922121
SEND RESULTS TO

COMMENTS.

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE) 11/17/99

ENSCOC2

EnSafe

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

PROJECT/JOB NO. 2911-001 -000-00
COC NO
PO NO: 2
REL NO. 82
LAB NAME. Savannah

CLIENT Navy Clean
PROJECT MANAGER S. Parker
LOCATION Zone K
TELE/FAX NO 843-884-0027/856-0107
SAMPLERS (SIGNATURE) Parker

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	VOC	SVOC	Pest/PCB	Metals							REMARKS
164EB03001	11-19-99	1300	W	40ml/500ml 1L Amber	4°	1/NO3 HCL	6	X	X	X	X							Equip Blank
164FB03001	"	"	W	"	4°	"	6	X	X	X	X							Field Blank
164DB03001	"	"	W	"	4°	"	6	X	X	X	X							DI Blank

11-19-99

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Parker	11-19-99	C. Vasquez	11/20/99				
PRINTED S. Parker	TIME 1500	PRINTED Sgt C. Vasquez	TIME 11:00	PRINTED	TIME	PRINTED	TIME
COMPANY EnSafe		COMPANY STL-SAV		COMPANY		COMPANY	

METHOD OF SHIPMENT FEDEX
DISPATCH NO 814795 922 121
SEND RESULTS TO S. Parker

COMMENTS. 21 Day TAT

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE) SC 12/8/99

ENSCOC2 REV 05/00

DATA VALIDATION REPORT
ZONE K
SDG #NBCK07

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	NBCK07
Date:	January 6, 2000
Client Name:	Ensafe
Project/Site Name:	Charleston Zone K
Date Sampled:	November 18, 1999
Number of Samples:	20 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Semivolatiles, PCBs and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Searson — 1-11-00

Paul B. Humburg, President — Date

4127 Plaza 94 South • St Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# NBCK07

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	SVOA		PCB		MET	
163SB01201	SOIL		X				
163SB01202	SOIL		X				
163SB01301	SOIL		X				X
163CB01301	SOIL		X				X
163SB01302	SOIL		X				X
164SB02101	SOIL		X				X
164CB02101	SOIL		X				X
164SB02102	SOIL		X				X
694SB02801	SOIL		X				
694CB02801	SOIL		X				
694SB02802	SOIL		X				
694SB02901	SOIL		X				X
694SB02902	SOIL		X				X
694SB03201	SOIL				X		X
694CB03201	SOIL				X		X
694SB03202	SOIL				X		X
694SB03301	SOIL				X		X
694SB03302	SOIL				X		X
694SB03501	SOIL		X				X
694SB03601	SOIL		X				X
Total Billable Samples (Water/Soil)		0	15	0	5	0	15

SVOA= Semivolatiles
PCB= PCBs
MET= Metals

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 2/94, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK07

A validation was performed on the Semivolatile Data from SDG NBCK07. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibration
*	•	Blanks
	•	Internal Standard Performance
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Internal Standards

The following sample exhibited non-compliant EICP area recoveries below the QC limits for the noted internal standards. All reported positive and non-detect results are qualified as estimated, J/UJ.

694SB02801	All Internal Standards

The following samples exhibited non-compliant EICP area recoveries above the QC limits for the noted internal standards. All reported positive results are qualified as estimated, J.

694SB02802	perylene-d12
694SB03601	

System Performance and Overall Assessment

The data, as reported, required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
694SB02801	*All associated with* All Internal Standards	+/-	J/UJ
694SB02802 694SB03601	*All associated with* perylene-d12	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8082; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK07

A validation was performed on the Aroclor Data from SDG NBCK07. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Surrogate Recoveries

The sample listed below exhibited low TCX and DCB recoveries. The positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

Sample ID	Surrogate	% Recovery
694SB03202	TCX-2	28%
	DCX-2	29%

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
694SB03202	ALL	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # NBCK07

A validation was performed on the Metals for soils Data from SDG BNCK07. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	2.91 mg/kg	no impact
Calcium	1.74 mg/kg	no impact
Iron	2.45 mg/kg	no impact
Potassium	2.7 mg/kg	no impact
Sodium	13.6 mg/kg	all soil samples below 68.0 mg/kg
Zinc	0.65 mg/kg	no impact
Tin	1.62 mg/kg	all soil samples below 8.1 mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect. "U".

Matrix Spike Recovery results

The matrix spike recoveries for soils for Chromium (72%), Magnesium (59%), Potassium (74%), Sodium (65%) and Zinc (69%) were below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

The matrix spike recovery for soils for Manganese (139%) was above the upper control limits (>125%). All positive results are qualified as estimated, "J".

Matrix Duplicate RPD results

The RPD for Mercury (20%) was not greater than 35%. No qualification is necessary.

Serial Dilution results

The serial dilution results for Zinc was greater than 10%. All positive results are qualified as estimated, "J".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 68.0 mg/kg	Na.	+	U
all soil samples below 8.1 mg/kg	Sn.		
all soil samples	Cr, Mg, K, Na and Zn.	+/U	J/UJ
all soil samples	Mn.	+	J
all soil samples	Zn.	+	J
all "B" results	all analytes	B	J

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CHAIN OF CUSTODY RECORD

PAGE 4 OF 4

PROJECT/JOB NO. 2911-001- 10-00

COC NO:

PO NO. 2

REL NO: 82

LAB NAME: Savannah

CLIENT: NAVY CLEAN

PROJECT MANAGER: S. PARKER

LOCATION:

TELE/FAX NO.:

SAMPLERS: (SIGNATURE)

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOCs									REMARKS
164 SB02001	11-18-99	1510	S	8oz Plastic	4°	—	1	X										
164 SB02002		1515	S	"			1	X										
164 SB01901		1520					1	X										
164 SB01902		1525					1	X										
164 SB01801		1530					1	X										
164 SB01802		1535					1	X										
164 SB01701		1540					1	X										
164 SB01702		1545					1	X										
164 SB01601		1550					1	X										
164 SB01602		1555					1	X										
164 SB02101		1600		8oz Glass/Plastic			2	X	X									
164 CB02101		1600		"			2	X	X									
164 SB02102		1610		"			2	X	X									
							11/18/99											

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Signature	11-18-99		11/18/99				
PRINTED Steve Parker	TIME 1700	PRINTED	TIME	PRINTED	TIME	PRINTED	TIME
COMPANY LaSalle		COMPANY		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX

SHIPMENT NO.

SEND RESULTS TO:

COMMENTS: 21 TAT 59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUS. _ _ Y RECORD

PAGE 1 OF 4
PROJECT/JOB NO. 2911-06 000-00
COC NO.
PO NO. 2
REL NO: 82
LAB NAME: Savannah

CLIENT: Navy CLEAN
LOCATION: Zone K
SAMPLERS (SIGNATURE): SP
PROJECT MANAGER: S. PARKER
TELE/FAX NO: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Metals								REMARKS
NAVY 163SB01602	11-18-99	1300	S	8oz Plastic	4°	—	1			X								
163SB01701		1305	S				1			X								
163SB01702		1310	S				1			X								
164SB02901		1325	S	4 Encore + 8oz Glass			3	X	X									
164SB02902		1330	S	"			3	X	X									
164SB02601		1335	S	"			3	X	X									
164TB02901		0900	W	40 ml VOA			3	X										Trip Blank
164SB02602		1345	S	Encore 4oz 8oz glass			3	X	X									
164SB02501		1400	S	"			3	X	X									
164SB02502		1410	S	"			3	X	X									
164SB02801		1420	S	"			3	X	X									
164CB02801		1420	S	"			3	X	X									
164SB02802		1425	S	"			3	X	X									
164SB02701		1440	S	"			3	X	X									
164SB02702		1450	S	"			3	X	X									
164SB01501		1505	S	Encore 4oz glass			3	X		X								

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
SP	11-18-99	[illegible]	11/19/99				
PRINTED: Steve Parker	TIME 1700	PRINTED: C.R. Strong	TIME 9:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: [illegible]		COMPANY:		COMPANY:	

METHOD OF SHIPMENT:
SHIPMENT NO:
SEND RESULTS TO:

COMMENTS: 21 DAY TAT SEQ-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

ENSAFE

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CHAIN OF CUSTODY RECORD

PAGE 2 OF 2
PROJECT/JOB NO: 2911-001- 100-00
COC NO:
PO NO. 2
REL NO: 82
LAB NAME: Savanah

CLIENT: Naval Base Charleston
LOCATION: Zone K
SAMPLERS. (SIGNATURE)
PROJECT MANAGER: Charlie Vernoy
TELE/FAX NO: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	SVOC	Metals	VOCs							REMARKS
MBCA\694SB03501	11/18/99	1330	S	SVOC/PCB = 8oz glass Metals = 8oz plastic	4°C	None	2	X	X								
MBCA\694SB03601	11/18/99	1345	S				2	X	X								
163SB01201		0930	S	8oz Glass			1	X									
163SB01202		0935	S	"			1	X									
163SB01601		0940	S				1	X									
163SB01602		0945	S				1	X									
163SB01501		0950	S				1	X									
163SB01502		0955	S				1	X									
163SB01401		1000	S				1	X									
163SB01402		1005	S				1	X									
163SB01301		1015	S	8oz Glass / 8oz Plast			2	X	X								
163CB01301		1015	S	"			2	X	X								
163SB01302		1620	S	"			2	X	X								
163SB01101		1030	S	8oz Glass			1	X									
163SB01102		1035	S	8oz Glass			1	X									
163SB01801		1255	S	8oz Plastic			1	X	X								

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Todd B. Temple	11/18/99	[illegible]	11/19/99				
PRINTED: Todd B. Temple	TIME 1700	PRINTED: [illegible]	TIME 9:30	PRINTED	TIME	PRINTED	TIME
COMPANY: ENSAFE		COMPANY: SVL - Savanah		COMPANY		COMPANY	

METHOD OF SHIPMENT: Fed Ex
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 DAY TAT

59-17857

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

057

EN'SAFE

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 4
PROJECT/JOB NO: 2911-001 000-00
COC NO.
PO NO. 2
REL NO: 82
LAB NAME: Savanah

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Verney
LOCATION: Zone K
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	Metals	SVOC	PCB	REMARKS
MW-1 694SB03101	11/18/99	1050	S	8oz glass 4oz Plastic = Metals	4°C	None	1	X			
694SB03102		1055	S				1	X			
694SB03001		1105	S				1	X			
694SB03002		1110	S				1	X			
694SB02901		1120	S				2	X	X		
694SB02902		1125	S				2	X	X		
694SB02801		1140	S				1		X		
694CB02801		1140	S				1		X		
694SB02802		1145	S				1		X		
694SB03401		1225	S				1	X			
694SB03402		1230	S				1	X			
694SB03301		1235	S				2	X		X	
694SB03302		1240	S				2	X		X	
694SB03201		1250	S				2	X		X	
694CB03201		1250	S				2	X		X	
694SB03202		1255	S				2	X		X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Todd B. Temple	11/18/99	[illegible]	11/19/99				
PRINTED Todd B. Temple	TIME 1700	PRINTED [illegible]	TIME 9:30	PRINTED	TIME	PRINTED	TIME
COMPANY NSWC		COMPANY [illegible]		COMPANY		COMPANY	

METHOD OF SHIPMENT: FedEx
SHIPMENT NO
SEND RESULTS TO:

COMMENTS: 21 Day TAT 59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 4 OF 4

PROJECT/JOB NO: 2911-001- 00-00

COC NO:

PO NO. 2

REL NO: 82

LAB NAME. Savannah

CLIENT Navy Clean

PROJECT MANAGER S. Parker

LOCATION

TELE/FAX NO.

SAMPLERS: (SIGNATURE)

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOCs									REMARKS
164/164SB02001	11-18-99	1510	S	8oz Plastic	4°	—	1	X										
164SB02002		1515	S	"			1	X										
164SB01901		1520					1	X										
164SB01902		1525					1	X										
164SB01801		1530					1	X										
164SB01802		1535					1	X										
164SB01701		1540					1	X										
164SB01702		1545					1	X										
164SB01601		1550					1	X										
164SB01602		1555					1	X										
164SB02101		1600		8oz Glass/Plastic			2	X	X									
164CB02101		1600		"			2	X	X									
164SB02102		1610		"			2	X	X									
							11/18/99											

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Steve Parker	11-18-99		11/18/				
PRINTED Steve Parker	TIME 1700	PRINTED	TIME	PRINTED	TIME	PRINTED	TIME
COMPANY LASalle		COMPANY		COMPANY		COMPANY	

METHOD OF SHIPMENT FEDEX

SHIPMENT NO

AND ADDRESS TO.

COMMENTS: 21 TAT 59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSFDC2

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, LANCASTER, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 2 OF 4
PROJECT/JOB NO. 2911-00 000-00
COC NO:
PO NO. 2
REL NO: 82
LAB NAME: Savannah

CLIENT: Navy CLEAN
LOCATION: Zone K
SAMPLERS: (SIGNATURE) SP
PROJECT MANAGER: S. PARKER
TELE/FAX NO: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	VOC	SVOC	Metals								REMARKS
MW/163SB01602	11-18-99	1300	S	8oz Plastic	4°	—	1			X								
163SB01701		1305	S				1			X								
163SB01702		1310	S				1			X								
164SB02901		1325	S	4 Encore + 4oz / 8oz Glass			3	X	X									
164SB02902		1330	S	"			3	X	X									
164SB02601		1335	S	"			3	X	X									
164TB02901		0900	W	40 ml VOA			3	X										Trip Blank
164SB02602		1345	S	Encore 4oz / 8oz Glass			3	X	X									
164SB02501		1400	S	"			3	X	X									
164SB02502		1410	S	"			3	X	X									
164SB02801		1420	S	"			3	X	X									
164CB02801		1420	S	"			3	X	X									
164SB02802		1425	S	"			3	X	X									
164SB02701		1440	S	"			3	X	X									
164SB02702		1450	S	"			3	X	X									
164SB01501		1505	S	Encore 4oz Glass			3	X		X								

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Signature: [signature]	11-18-99	Signature: [signature]	11/19/99	Signature:		Signature:	
Printed: Steve Parker	TIME 1700	Printed: C. R. Sm[illegible]	TIME 9:30	Printed:	TIME	Printed:	TIME
Company: ENSAFE		Company: [illegible]		Company:		Company:	

METHOD OF SHIPMENT:
SHIPMENT NO
SEND RESULTS TO:

COMMENTS: 21 DAY TAT SG-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

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800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 2 OF 2

PROJECT/JOB NO: 2911-001 000-00

COC NO:

PO NO: 2

REL NO. 82

LAB NAME: Savannah

CLIENT: Naval Base Charleston

PROJECT MANAGER: Charlie Verney

LOCATION: Zone K

TELE/FAX NO. 843-884-0029/856-0107

SAMPLERS (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOC	Metals	VOCs	REMARKS
MBCA\694SB03501	11/18/99	1330	S	SVOC/PCB = 8oz glass Metals = 8oz plastic	4°C	None	2	X	X		
MBCA\694SB03601	11/18/99	1345	S	↓	↓	↓	2	X	X		
163SB01201		0930	S	8oz Glass			1	X			
163SB01202		0935	S	"			1	X			
163SB01601		0940	S				1	X			
163SB01602		0945	S				1	X			
163SB01501		0950	S				1	X			
163SB01502		0955	S				1	X			
163SB01401		1000	S				1	X			
163SB01402		1005	S	↓			1	X			
163SB01301		1015	S	8oz Glass / 8oz Plastic			2	X	X		
163CB01301		1015	S	"			2	X	X		
163SB01302		1020	S	"			2	X	X		
163SB01101		1030	S	8oz Glass			1	X			
163SB01102		1035	S	8oz Glass			1	X			
163SB01801	↓	1255	S	8oz Plastic	↓	↓	1	X	X		

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	11/18/99	[signature]	11/19/99				
PRINTED: Todd B. Temple	TIME 1700	PRINTED: Eric Sicay	TIME 9:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: SPL - Sav		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fed Ex

SHIPMENT NO.

SEND RESULTS TO.

COMMENTS: 21 DAY TAT

59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
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800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1
PROJECT/JOB NO: 2911-001 000-00
COC NO:
PO NO: 2
REL NO. 82
LAB NAME: Savanah

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Verney
LOCATION: Zone K
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE) [signature]

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOC	PCB	REMARKS
HCA 694SB03101	11/18/99	1050	S	8oz glass SVOC/PCB 2oz Plastic Metals	4°C	None	1	X			
694SB03102		1055	S				1	X			
694SB03001		1105	S				1	X			
694SB03002		1110	S				1	X			
694SB02901		1120	S				2	X	X		
694SB02902		1125	S				2	X	X		
694SB02801		1140	S				1		X		
694CB02801		1140	S				1		X		
694SB02802		1145	S				1		X		
694SB03401		1225	S				1	X			
694SB03402		1230	S				1	X			
694SB03301		1235	S				2	X		X	
694SB03302		1240	S				2	X		X	
694SB03201		1250	S				2	X		X	
694CB03201		1250	S				2	X		X	
694SB03202		1255	S				2	X		X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	11/18/99	[signature]	11/19/99				
PRINTED: Todd B. Temple	TIME 1700	PRINTED: [illegible]	TIME 9:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: SWA		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FedEx
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 Day TAT SG-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

ENSAFE

800-308-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, LANCASTER, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 4 OF 4

PROJECT/JOB NO. 2911-001 000-00

COC NO:

PO NO. 2

REL NO: 82

LAB NAME: Savannah

CLIENT: NAVY CLEAN

PROJECT MANAGER: S. PARKER

LOCATION:

TELE/FAX NO.:

SAMPLERS (SIGNATURE):

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	Metals	SVOCs									REMARKS
164SB02001	11-18-99	1510	S	8oz Plastic	4°	—	1	X										
164SB02002		1515	S	"			1	X										
164SB01901		1520					1	X										
164SB01902		1525					1	X										
164SB01801		1530					1	X										
164SB01802		1535					1	X										
164SB01701		1540					1	X										
164SB01702		1545					1	X										
164SB01601		1550					1	X										
164SB01602		1555					1	X										
164SB02101		1600		8oz Glass/Plastic			2	X	X									
164CB02101		1600		"			2	X	X									
164SB02102		1610		"			2	X	X									
							11/18/99											

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Steve Parker	11-18-99		11/18/99				
PRINTED: Steve Parker	TIME 1700	PRINTED		PRINTED	TIME	PRINTED	TIME
COMPANY: EnSafe		COMPANY		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX

SHIPMENT NO.

SEND RESULTS TO:

C:

COMMENTS: 21 TAT 559-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSC002

ENSAFE

800-388-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUS DY RECORD

PAGE 2 OF 4
PROJECT/JOB NO: 2911-06 -000-00
COC NO.
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: Navy CLEAN
LOCATION: Zone K
SAMPLERS. (SIGNATURE): SP
PROJECT MANAGER: S. PARKER
TELE/FAX NO. 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Metals								REMARKS
MPCV/163SB01602	11-18-99	1300	S	8oz Plastic	4°	—	1			X								
163SB01701		1305	S				1			X								
163SB01702		1310	S				1			X								
164SB02901		1325	S	4 Encore + 8oz Glass			3	X	X									
164SB02902		1330	S	"			3	X	X									
164SB02601		1335	S	"			3	X	X									
164TB02901		0900	W	40 ml VOA			3	X										Trip Blank
164SB02602		1345	S	Encore 4oz 8oz Glass			3	X	X									
164SB02501		1400	S	"			3	X	X									
164SB02502		1410	S	"			3	X	X									
164SB02801		1420	S	"			3	X	X									
164CB02801		1420	S	"			3	X	X									
164SB02802		1425	S	"			3	X	X									
164SB02701		1440	S	"			3	X	X									
164SB02102		1450	S	"			3	X	X									
164SB01501		1505	S	Encore 4oz			3	X		X								

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Signature	11-18-99	Signature	11/19/99				
PRINTED: Steve Parker	TIME: 1700	PRINTED: C.R. Sikorsky	TIME: 9:32	PRINTED	TIME	PRINTED	TIME
COMPANY: ENSAFE		COMPANY: TTL-SAV		COMPANY		COMPANY	

METHOD OF SHIPMENT:
SHIPMENT NO
SEND RESULTS TO:

COMMENTS: 21 DAY TAT 59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSEDC2

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, LANCASTER, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 2 OF 2 1
PROJECT/JOB NO: 2911-001- 000-00
COC NO.
PO NO: 2
REL NO: 82
LAB NAME: Savanah

CLIENT: Naval Base Charleston
LOCATION: Zone K
SAMPLERS. (SIGNATURE)
PROJECT MANAGER: Charlie Vernoy
TELE/FAX NO.: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOC	Metals	VOCs	REMARKS
MBGA\694SB03501	11/18/99	1330	S	SVOC/PCB = 8oz glass Metals = 8oz plastic	4°C	None	2	X	X		
MBGA\694SB03601	11/18/99	1345	S	↓	↓	↓	2	X	X		
163SB01201		0930	S	8oz Glass			1	X			
163SB01202		0935	S	"			1	X			
163SB01601		0940	S				1	X			
163SB01602		0945	S				1	X			
163SB01501		0950	S				1	X			
163SB01502		0955	S				1	X			
163SB01401		1000	S				1	X			
163SB01402		1005	S	↓			1	X			
163SB01301		1015	S	8oz Glass / 8oz Plast			2	X	X		
163CB01301		1015	S	"			2	X	X		
163SB01302		1620	S	"			2	X	X		
163SB01101		1030	S	8oz Glass			1	X			
163SB01102		1035	S	8oz Glass			1	X			
163SB01801		1255	S	8oz Plastic			1	X	X		

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Todd B. Temple	11/18/99	PRINTED: E.K. Sisam	11/19/99	PRINTED:		PRINTED:	
PRINTED:	TIME 1700	COMPANY: SVL - Sav	TIME 9:32	COMPANY:	TIME	COMPANY:	TIME
COMPANY: ENSAFE							

METHOD OF SHIPMENT: Fed Ex
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 DAY TAT

59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

ENSAFE

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MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 4
PROJECT/JOB NO: 2911-001- -000-00
COC NO:
PO NO. 2
REL NO: 82
LAB NAME: Savanah

CLIENT: Naval Base Charleston
LOCATION: Zone K
SAMPLERS. (SIGNATURE): [signature]
PROJECT MANAGER: Charlie Verney
TELE/FAX NO: 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOC	PCB	REMARKS
MW-1 694SB03101	11/18/99	1050	S	8oz glass SVOC, PCB 8oz Plastic = Metals	4°C	None	1	X			
694SB03102		1055	S				1	X			
694SB03001		1105	S				1	X			
694SB03002		1110	S				1	X			
694SB02901		1120	S				2	X	X		
694SB02902		1125	S				2	X	X		
694SB02801		1140	S				1		X		
694SB02801		1140	S				1		X		
694SB02802		1145	S				1		X		
694SB03401		1225	S				1	X			
694SB03402		1230	S				1	X			
694SB03301		1235	S				2	X		X	
694SB03302		1240	S				2	X		X	
694SB03201		1250	S				2	X		X	
694CB03201		1250	S				2	X		X	
694SB03202		1255	S				2	X		X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	11/18/99	[signature]	11/17/99				
PRINTED: Todd B. Temple	TIME 1700	PRINTED: [illegible]	TIME 9:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: SLL [illegible]		COMPANY		COMPANY:	

METHOD OF SHIPMENT: FedEx
AIRBILL NO: 54-1785 1
SEND RESULTS TO:

COMMENTS: 21 Day TAT

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

DATA VALIDATION REPORT
ZONE K
SDG #NBCK06

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	NBCK06
Date:	January 6, 2000
Client Name:	Ensafe
Project/Site Name:	Charleston Zone K
Date Sampled:	November 18, 1999
Number of Samples:	20 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Erica K. Ketcham
Paul B. Humburg, President

1/7/00
Date

4127 Plaza 94 South • St Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# NBCK06

Samples and Fractions Reviewed

Sample Identifications Analytical Fraction

ENSAFE ID	MATRIX	MET	
163SB01701	SOIL		X
163SB01702	SOIL		X
163SB01801	SOIL		X
163SB01802	SOIL		X
164SB01601	SOIL		X
164SB01602	SOIL		X
164SB01701	SOIL		X
164SB01702	SOIL		X
164SB01801	SOIL		X
164SB01802	SOIL		X
164SB01901	SOIL		X
164SB01902	SOIL		X
164SB02001	SOIL		X
164SB02002	SOIL		X
694SB03001	SOIL		X
694SB03002	SOIL		X
694SB03101	SOIL		X
694SB03102	SOIL		X
694SB03401	SOIL		X
694SB03402	SOIL		X
Total Billable Samples (Water/Soil)		0	20

MET= Metals

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # NBCK06

A validation was performed on the Metals Data from SDG NCBK06. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
*	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	3.70 mg/kg	no impact
Calcium	1.64 mg/kg	no impact
Potassium	3.44 mg/kg	no impact
Sodium	21.8 mg/kg	all soil samples below 109.0 mg/kg
Tin	1.56 mg/kg	all soil samples below 7.8 mg/kg
Zinc	1.57 mg/kg	all soil samples below 7.9 mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

Serial Dilution recovery results

The serial dilution results for soils for Cobalt, Lead, Nicckel and Zinc were greater than 10%. All positive results are qualified as estimated, "J".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 109.0 mg/kg	Na.	+	U
all soil samples below 7.8 mg/kg	Sn.		
all soil samples below 7.9 mg/kg	Zn.		
all soil samples	Co, Pb, Ni and Zn.	+	J
all "B" results	all analytes	B	J

ENSAFE

800-346
MEMPHIS, TN
CHARLESTON, SC; CINCINNATI, OH; DALLAS; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 4
PROJECT/JOB NO: 2911 01-000
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savanah

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Verney
LOCATION: Zone K
TELE/FAX NO.: 843-884-0019/856-0107
SAMPLERS: (SIGNATURE) [signature]

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOC	PCB	REMARKS
NBCK 6945B03101	11/18/99	1050	S	8oz glass SVOC/PCB 2oz Plastic = Metals	4°C	None	1	X			
6945B03102		1055	S				1	X			
6945B03001		1105	S				1	X			
6945B03002		1110	S				1	X			
6945B02901		1120	S				2	X	X		
6945B02902		1125	S				2	X	X		
6945B02801		1140	S				1		X		
6945CB02801		1140	S				1		X		
6945B02802		1145	S				1		X		
6945B03401		1225	S				1	X			
6945B03402		1230	S				1	X			
6945B03301		1235	S				2	X		X	
6945B03302		1240	S				2	X		X	
6945B03201		1250	S				2	X		X	
6945CB03201		1250	S				2	X		X	
6945B03202		1255	S				2	X		X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	11/18/99	[signature]	11/19/99				
PRINTED: Todd B. Temple	TIME 1700	PRINTED: E.R. Sicay	TIME 9:30	PRINTED	TIME	PRINTED	TIME
COMPANY: ENSAFE		COMPANY: STL-SAV.		COMPANY		COMPANY:	

METHOD OF SHIPMENT: FedEx
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 Day TAT 54-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

EHS01.F

ENSAFE

800-388-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 2 OF Sheet 4
PROJECT/JOB NO: 2111 99-000
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Vernoy
LOCATION: Zone K
TELE/FAX NO.: 843-884-0029/856-0107
SAMPLERS (SIGNATURE):

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	SVOC	Metals	VOCs	REMARKS
NBCK\694SB03501	11/18/99	1330	S	SVOC/PCB = 8oz glass Metals = 8oz plastic	4°C	None	2	X	X		
NBCK\694SB03601	11/18/99	1345	S	↓	↓	↓	2	X	X		
163SB01201		0930	S	8oz Glass			1	X			
163SB01202		0935	S	"			1	X			
163SB01601		0940	S	↓			1	X			
163SB01602		0945	S				1	X			
163SB01501		0950	S				1	X			
163SB01502		0955	S				1	X			
163SB01401		1000	S				1	X			
163SB01402		1005	S	↓			1	X			
163SB01301		1015	S	8oz Glass / 8oz Plast			2	X	X		
163CB01301		1015	S	"			2	X	X		
163SB01302		1620	S	"			2	X	X		
163SB01101		1030	S	8oz Glass			1	X			
163SB01102		1035	S	8oz Glass			1	X			
163SB01801		1255	S	8oz Plastic			1	X	X		

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Todd B. Temple	11/18/99	ER Sicay	11/19/99				
PRINTED: Todd B. Temple	TIME: 1700	PRINTED: ER Sicay	TIME: 9:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: STL - SAV		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fed Ex
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 DAY TAT 99-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCHF

ENSAFE

800-348-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 3 OF 11

PROJECT/JOB NO 2911 09-000-07

COC NO:

PO NO: 2

REL NO: 82

LAB NAME: Savannah

CLIENT: Navy CLEAN

PROJECT MANAGER: S. PARKER

LOCATION: Zone K

TELE/FAX NO. 843-884-0029/852-0107

SAMPLERS: (SIGNATURE) [signature]

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	VOC	SVOC	Metals								REMARKS
NBCK/1635B01802	11-18-99	1300	S	8oz Plastic	4°	—	1			X								
163SB01701		1305	S				1			X								
163SB01702		1310	S				1			X								
164SB02901		1325	S	Encore 4oz/8oz Glass			3	X	X									
164SB02902		1330	S	"			3	X	X									
164SB02601		1335	S	"			3	X	X									
164TB02901		0900	W	40 ml VOA			3	X										Trip Blank
164SB02602		1345	S	Encore 4oz 8oz Glass			3	X	X									
164SB02501		1400	S	"			3	X	X									
164SB02502		1410	S	"			3	X	X									
164SB02801		1420	S	"			3	X	X									
164CB02801		1420	S	"			3	X	X									
164SB02802		1425	S	"			3	X	X									
164SB02701		1440	S	"			3	X	X									
164SB02702		1450	S	"			3	X	X									
164SB01501		1505	S	Encore 4oz 8oz Glass			3	X		X								

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	11-18-99	[signature]	11/19/99				
PRINTED: STEVE PARKER	TIME 1700	PRINTED: E.R. SICKAY	TIME 9:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: STL-SV		COMPANY:		COMPANY	

METHOD OF SHIPMENT:

SHIPMENT NO

SEND RESULTS TO:

COMMENTS: 21 DAY TAT SV-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCO

ENSAFE

800-388-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 4 OF 4
PROJECT/JOB NO: 2911-09-00
COC NO.
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: NAVY CLEAN
PROJECT MANAGER: S. PARKER
LOCATION:
TELE/FAX NO.:
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	Metals	SVOCs	REMARKS
NBCR/164SB02001	11-18-99	1510	S	8oz Plastic	4°	—	1	X		
164SB02002		1515	S	"			1	X		
164SB01901		1520					1	X		
164SB01902		1525					1	X		
164SB01801		1530					1	X		
164SB01802		1535					1	X		
164SB01701		1540					1	X		
164SB01702		1545					1	X		
164SB01601		1550					1	X		
164SB01602		1555					1	X		
164SB02101		1600		8oz Glass+Plast			2	X	X	
164CB02101		1600		"			2	X	X	
164SB02102		1610		"			2	X	X	
					SP		11/18/99			

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Steve Parker	11-18-99	[illegible]	11/19/99				
PRINTED: Steve Parker	TIME 1700	PRINTED: [illegible]	TIME 9:30	PRINTED:	TIME	PRINTED	TIME
COMPANY: EnSafe		COMPANY: SL-Sav		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 TAT 59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

0411

Savannah Laboratories

TOTAL METALS
- Cover Page -
INORGANIC ANALYSIS DATA PACKAGE

:act: SDG No.

Lab Code: SLSAV Case No.: SAS No

SOW No.: SW-846

Sample No.	Lab Sample ID.
694SB03101	S917851-1
163SB01702	S917851-10
164SB02001	S917851-11
164SB02002	S917851-12
164SB01901	S917851-13
164SB01902	S917851-14
164SB01801	S917851-15
164SB01802	S917851-16
164SB01701	S917851-17
164SB01702	S917851-18
164SB01601	S917851-19
694SB03101S	S917851-1S
694SB03101SD	S917851-1SD
694SB03102	S917851-2
164SB01602	S917851-20
694SB03001	S917851-3
694SB03002	S917851-4

:e ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

: ature: Name:

Date. Title

Savannah Laboratories

TOTAL METALS
- Cover Page -
INORGANIC ANALYSIS DATA PACKAGE

:act: SDG No.: [illegible]06

Lab Code: SLSAV Case No.: SAS No.:

SOW No.: SW-846

Sample No.	Lab Sample ID.
694SB03401	S917851-5
694SB03401S	S917851-5S
694SB03401SD	S917851-5SD
694SB03402	S917851-6
163SB01801	S917851-7
163SB01802	S917851-8
163SB01701	S917851-9

:e ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

i ature _____ Name: _____

Date _____ Title: _____

041

DATA VALIDATION REPORT
ZONE K
SDG #41577

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	41577
Date:	January 28, 2000
Client Name:	Ensafe
Project/Site Name:	Charleston Zone K
Date Sampled:	December 22, 1999
Number of Samples:	30 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Southwest Laboratory of Oklahoma, Inc.
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Semivolatiles, Metals and Total Organic Carbon

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Scarpson
for Paul B. Humburg, President

2-1-00.
Date

4127 Plaza 94 South • St Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# 41577

Samples and Fractions Reviewed

Sample Identifications Analytical Fractions

ENSAFE ID	MATRIX	SVOA		MET		TOC	
162SB01901	SOIL		X				X
162SB01902	SOIL		X				X
162SB02001	SOIL		X				
162SB02002	SOIL		X				
162SB02101	SOIL		X				
162SB02102	SOIL		X				
163SB01901	SOIL		X				
163SB01902	SOIL		X				
164SB02201	SOIL				X		
164SB02202	SOIL				X		
164SB02301	SOIL				X		
164SB02302	SOIL				X		
164SB02401	SOIL				X		
164SB02402	SOIL				X		
164SB03301	SOIL		X				
164SB03302	SOIL		X				
164SB03401	SOIL				X		
164SB03402	SOIL				X		
698SB03401	SOIL				X		
698SB03402	SOIL				X		
698SB04201	SOIL				X		
698SB04202	SOIL				X		
698SB04301	SOIL				X		
698SB04302	SOIL				X		
ASRSB001T1	SOIL						X
ASRSB001T2	SOIL						X
ASRSB002T1	SOIL						X
ASRSB002T2	SOIL						X
ASRSB003T1	SOIL						X
ASRSB003T2	SOIL						X
Total Billable Samples (Water/Soil)		0	10	0	14	0	8

SVOA= Semivolatiles
MET= Metals
TOC= Total Organic Carbon

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8270C; the National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results.

SDG # 41577

A validation was performed on the Semivolatile Data from SDG 41577. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
* Calibrations
* Internal Standard Performance
* Blanks
* Surrogate Recoveries
* Laboratory Control Samples
* Matrix Spike/Matrix Spike duplicate
* Field Duplicates
* Compound Identification/Quantitation

* - All criteria were met for this parameter

System Performance and Overall Assessment

The data as presented requires no qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

No qualifications required.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS AND TOC

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # 41577

A validation was performed on the Metals and toc Data from SDG 41577. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
*	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Tin	0.81 mg/kg	all soil samples below 4.1 mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

All sample results left with a "B" qualifier after all other qualifications. will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 4.1 mg/kg	Sn.	+	U
all "B" results	all analytes	B	J

ENSAFE

38-7962
MEMPHIS, TENNESSEE
LESTER, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, ASTER, TX, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTO' RECORD

PROJECT/JOB NO 2911-001-09000-00
COC NO.
PO NO 4
REL NO 136
LAB NAME SWL

CLIENT Navy
LOCATION Zone K
SAMPLERS. (SIGNATURE)

PROJECT MANAGER Charlie Verney
TELE/FAX NO 843-884-0029

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOC	TOC	REMARKS
1BCK1 ASRSB001T1	12/22/99	1020	S	4oz glass	4°C	None	1			X	1.8°C
ASRSB001T2		1025	S				1			X	
698SB03401		1040	S				1	X			
698SB03402		1045	S				1	X			
698SB04301		1045	S				1	X			
698SB04302		1050	S				1	X			
698SB04201		1050	S				1	X			
698SB04202		1055	S				1	X			
162SB01901		1105	S				2		X	X	
162SB01902		1110	S				2		X	X	
162SB02101		1105	S				1		X		
162SB02102		1110	S				1		X		
162SB02001		1115	S				1		X		
162SB02002		1120	S				1		X		

12-22-99

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Todd B. Temple	12/22/99		12-23-99				
PRINTED	TIME 1700	PRINTED	TIME 9:45	PRINTED	TIME	PRINTED	TIME
ENSAFE		COMPANY SWL		COMPANY		COMPANY	

METHOD OF SHIPMENT FedEX
SHIPMENT NO 4849147951
CHAIN RETURNS TO

COMMENTS.

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

ENSAFE

-589-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUST OY RECORD

PAGE ___ OF ___

PROJECT/JOB NO. 2911-00 9000-0C
COC NO
PO NO 4
REL NO 136
LAB NAME SWL

CLIENT Navy
LOCATION Zone K
SAMPLERS (SIGNATURE)

PROJECT MANAGER Charlie Verney
TELE/FAX NO 843-884-0029

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOC	TOC	REMARKS
NA. K) 1645B02201	12/22/99	0925	S	4oz glass	4°C	None	1	X			1.8°C
1645B02202		0930	S				1	X			
1645B03401		0935	S				1	X			
1645B03402		0940	S				1	X			
1645B02401		0935	S				1	X			
1645B02402		0940	S				1	X			
1645B02301		0945	S				1	X			
1645B02302		0950	S				1	X			
1645B03301		0950	S				1		X		
1645B03302		0955	S				1		X		
1635B01901		1000	S				1		X		
1635B01902		1005	S				1		X		
ASRSB003T1		1010	S				1			X	
ASRSB003T2		1015	S				1			X	
ASRSB002T1		1010	S				1			X	
ASRSB002T2		1015	S				1			X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
	12/22/99		12-23-99				
PRINTED Todd B Temple	TIME 1700	PRINTED Jason Smith	TIME 9:45	PRINTED	TIME	PRINTED	TIME
COMPANY ENSAFE		COMPANY Swco		COMPANY		COMPANY	

METHOD OF SHIPMENT: Fed Ex
SHIPMENT NO 4849147951
SEND RESULTS TO

COMMENTS:

0451

MEDICAL DATA RECEIVED BY (INITIALS/DATE)

SAMPLE RESULT VERIFICATION
SEMIVOLATILE ORGANIC FRACTION

1. Were the sample results reported within the calibration range? Yes No

2. Were the percent moistures reported? Yes No NR

3. Were the data reported on a dry weight basis? Yes No NR

4. Did the GC/MS RIC and TIC exhibit interferences, off scale peaks or elevated baseline? Yes No

5. Did the data contain elevated detection limits that could not be accounted for? Yes No

6. Were any computational or transcription errors found? Yes No

Specific Comments: _____

Reviewer: L Maschoff Date: 01/31/00

ENSAFE

38-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO. 2911-001-09[illegible]-00
COC NO.
PO NO 4
REL NO. 136
LAB NAME. SWL

CLIENT Navy
LOCATION Zone K
SAMPLERS. (SIGNATURE)
PROJECT MANAGER Charlie Verney
TELE/FAX NO 843-884-0029

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOC	TOC	REMARKS
1 BCK ASRSB001T1	12/22/99	1020	S	4oz glass	4°C	None	1		X		1.8°C
ASRSB001T2		1025	S				1		X		
6985B03401		1040	S				1	X			
6985B03402		1045	S				1	X			
6985B04301		1045	S				1	X			
6985B04302		1050	S				1	X			
6985B04201		1050	S				1	X			
6985B04202		1055	S				1	X			
1625B01901		1105	S				2		X	X	
1625B01902		1110	S				2		X	X	
1625B02101		1105	S				1		X		
1625B02102		1110	S				1		X		
1625B02001		1115	S				1		X		
1625B02002		1120	S				1		X		

12-22-99

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Todd B. Temple	12/22/99	[illegible]	12-23-99				
PRINTED	TIME 1700	PRINTED [illegible]	TIME 9:45	PRINTED	TIME	PRINTED	TIME
COMPANY ENSAFE		COMPANY SWLO		COMPANY		COMPANY	

METHOD OF SHIPMENT FedEx
SHIPMENT NO 4849147957
CHAIN RESULTS TO.

COMMENTS.

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

ENSAFE

800-388-7962
MEMPHIS, TENNESSEE
TEXAS, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, LEWISBURG, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE ___ OF ___

PROJECT/JOB NO. 2911-001-7000-00
COC NO
PO NO 4
REL NO 136
LAB NAME SWL

CLIENT Navy
LOCATION Zone K
SAMPLERS (SIGNATURE)

PROJECT MANAGER Charlie Verney
TELE/FAX NO 843-884-0029

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	Metals	SVOC	TOC	REMARKS
JB. K\ 1645B02201	12/22/99	0925	S	4oz glass	4°C	None	1	X			1.8°C
1645B02202		0930	S				1	X			
1645B03401		0935	S				1	X			
1645B03402		0940	S				1	X			
1645B02401		0935	S				1	X			
1645B02402		0940	S				1	X			
1645B02301		0945	S				1	X			
1645B02302		0950	S				1	X			
1645B03301		0950	S				1		X		
1645B03302		0955	S				1		X		
1635B01901		1000	S				1		X		
1635B01902		1005	S				1		X		
ASRSB003T1		1010	S				1			X	
ASRSB003T2		1015	S				1			X	
ASRSB002T1		1010	S				1			X	
ASRSB002T2		1015	S				1			X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
	12/22/99		12-23-99				
PRINTED Todd B. Temple	TIME 1700	PRINTED Jason Stroud	TIME 9:46	PRINTED	TIME	PRINTED	TIME
COMPANY ENSAFE		COMPANY Swco		COMPANY		COMPANY	

METHOD OF SHIPMENT Fed Ex
SHIPMENT NO 4849147951
SEND RESULTS TO

COMMENTS

ADDITIONAL DATA RECEIVED BY (INITIALS/DATE)

9960

Data Validation Report

Zone K

SDG # NBCK01

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	NBCK01
Date:	November 15, 1999
Client Name:	Ensafe
Project/Site Name:	Charleston Zone K
Date Sampled:	October 12, 1999
Number of Samples:	42 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Semivolatiles, SPLP Semivolatiles, Pesticides/PCBs, SPLP Pesticides/PCBs, Metals, SPLP Metals, and Total Organic Carbon

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Searles — 11-19-99

Paul B. Humburg, President — Date

4127 Plaza 94 South • St Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# NBCK01

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	SVOA		SPLP-SV		P/P		SPLP-P/P		MET		SPLP-MET		TOC	
161SB008T1	SOIL										X				X
161SB008S1	SOIL												X		
161SB008T2	SOIL										X				X
161SB008S2	SOIL												X		
162SB002T1	SOIL		X				X				X				X
162SB002S1	SOIL				X				X				X		
162CB002T1	SOIL		X				X				X				X
162CB002S1	SOIL				X				X				X		
162SB002T2	SOIL		X				X				X				X
162SB002S2	SOIL				X				X				X		
162SB009T1	SOIL										X				X
162SB009S1	SOIL												X		
162SB009T2	SOIL										X				X
162SB009S2	SOIL												X		
163SB002T1	SOIL										X				X
163SB002S1	SOIL												X		
163SB002T2	SOIL										X				X
163SB002S2	SOIL												X		
163SB007T1	SOIL		X												X
163SB007S1	SOIL				X										
163SB007T2	SOIL		X												X
163SB007S2	SOIL				X										
163SB008T2	SOIL		X												X
163SB008S2	SOIL				X										
164SB001T1	SOIL										X				X
164SB001S1	SOIL												X		
164SB001T2	SOIL										X				X
164SB001S2	SOIL												X		
164SB002T1	SOIL										X				X
164SB002S1	SOIL												X		
164SB002T2	SOIL										X				X
164SB002S2	SOIL												X		
164SB004T1	SOIL		X												X
164SB004S1	SOIL				X										
164SB004T2	SOIL		X												X
164SB004S2	SOIL				X										
164SB005T2	SOIL										X				X
164SB005S2	SOIL												X		
164SB006T1	SOIL										X				X
164SB006S1	SOIL												X		
164SB006T2	SOIL										X				X
164SB006S2	SOIL												X		
Total Billable Samples (Water/Soil)		0	8	0	8	0	3	0	3	0	16	0	16	0	21

SVOA= Semivolatiles
SPLP-SV= SPLP Semivolatiles
P/P= Pesticides/PCBs
SPLP-P/P= SPLP Pesticides/PCBs
MET= Metals
SPLP-MET= SPLP Metals
TOC= Total Organic Carbon

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

TOTAL AND SPLP SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Total and SPLP Semivolatiles; the National Functional Guidelines for Organic Data Validation, 2/94, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK01

A validation was performed on the Total and SPLP Semivolatile Data from SDG NBCK01. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
*	•	Blanks
	•	Internal Standard Performance
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration standard GQ013 exhibited one (1) compound with a D greater than 50% but less than 90%. For the following samples and non-compliant compound, the reported positive and non-detect results are qualified as estimated, J.

164SB004T2	2,4-dinitrophenol (55.0%)
162SB002T2	

Internal Standards

The following sample exhibited non-compliant EICP area recoveries below the QC limits for the noted internal standard. All reported positive and non-detect results are qualified as estimated, J/UJ.

162CB002S1	perylene-d12

Compound Quantitation

For the following samples, the reported results are not used in favor of the results reported from the original analyses of the samples. Both analyses exhibited similar QC results.

163SB007T2RE
162CB002S1RE

System Performance and Overall Assessment

The data, as reported, required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
164SB004T2 162SB002T2	2,4-dinitrophenol (55.0%)	+/-	J/UJ
162CB002S1	*All associated with* perylene-d12	+/-	J/UJ
163SB007T2RE 162CB002S1RE	All Compounds	+/-	Do Not Use

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8081/8082; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK01

A validation was performed on the Pesticide/Aroclor Data from SDG NBCK01. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Continuing Calibrations

The continuing calibration analyzed on 10/19/99 at 13:32 exhibited one (1) compound with a %D greater than 15% and required qualifications. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

162CB002T1	Endrin Ketone (-16.8%)

Field Duplicates

The field duplicate pair of samples 162SB002T1 and 162CB002T1 exhibited high RPDs for several compound and required qualifications. For the following samples and compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

162SB002T1	4,4'-DDT (200%)
162CB002T1	

Compound Quantitation

Several samples exhibited column quantitation %Ds greater than 40%. The following guidelines were used to qualify the data:

1. No qualifications are required for positive sample results which exhibited column quantitation differences < 40%. The "P" flag is removed from the result.

2. The positive sample result which exhibited a column quantitation difference >40%, but ≤100% is qualified as estimated, J.

3. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and is <10X the respective compound CRQL, is qualified as non-detect, U. (All multi-component results are exempt from this rule.)

4. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and >10X the respective compound CRQL, is qualified as presumptively present at an estimated concentration, NJ. (All multi-component results are exempt from this rule.)

Compound Quantitation, Continued

5. The positive multi-component pesticide sample result which exhibited a column quantitation difference > 100% and < 10% the respective multi-component CRQL is qualified as presumptively present at an estimated concentration, NJ.

The following samples and compounds have been qualified for high column quantitation %Ds.

Sample ID	Compound	%D	Lab Qual.	HESI Qual.	Ref. #
162SB002T1	Endrin	174.9%	P	U	3
	Endosulfan II	130.6%	P	U	3
	4,4'-DDD	40.9%	P	J	2
	Endosulfan Sulfate	191.3%	P	U	3
	Methoxychlor	59.7%	P	J	2
	Endrin Ketone	62.3%	P	J	2
	Endrin Aldehyde	84.0%	P	J	2
	Gamma-Chlordane	66.7%	P	J	2
162CB002T1	Gamma-Chlordane	84.2%	P	J	2

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
162CB002T1	Endrin Ketone	+	J
162SB002T1 162CB002T1	4,4'-DDT	+/-	J/UJ
ALL	All P < 40%	+	
ALL	All P > 40% But ≤ 100%	+	J
ALL	single component pests All P > 100% And < 10X CRQL	+	U
ALL	single component pests All P > 100% And > 10X CRQL	+	NJ
ALL	multi- component pests All P > 100% And < 10X CRQL	+	NJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE

SPLP PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8081/8082 modified for the SPLP methodology; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK01

A validation was performed on the Pesticide/Aroclor Data from SDG NBCK01. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Surrogate Recoveries

The sample listed below exhibited low TCX and DCB recoveries. The positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

Sample ID	Surrogate	% Recovery
162SB002S1	TCX-1	28%
	DCB-1/DCB-2	21%/18%

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
162SB002S1	ALL	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS (SOILS AND SPLP) AND TOC

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # NBCK01

A validation was performed on the Metals for soils and SPLP and TOC Data from SDG NBCK01. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
	•	Matrix Duplicates
	•	Field Duplicates
*	•	Laboratory Control Samples
	•	Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	2.65 mg/kg	no impact
Calcium	1.80 mg/kg	no impact
Iron	2.34 mg/kg	no impact
Potassium	1.79 mg/kg	no impact
Tin	1.44 mg/kg	all soil samples below 7.2 mg/kg
Zinc	0.67 mg/kg	no impact
Aluminum	46.2 ug/l	all SPLP samples below 231 ug/l

Barium	1.34 ug/l	all SPLP samples below 6.7 ug/l
Calcium	233 ug/l	all SPLP samples below 1165 ug/l
Copper	0.61 ug/l	all SPLP samples below 3.05 ug/l
Iron	19.3 ug/l	all SPLP samples below 96.5 ug/l
Magnesium	111 ug/l	all SPLP samples below 555 ug/l
Potassium	64.8 ug/l	all SPLP samples below 324 ug/l
Zinc	6.7 ug/l	all SPLP samples below 33.5 ug/l

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

The preparation blanks exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Beryllium	-0.06 mg/kg	all soil samples below 0.6 mg/kg
Cadmium	-0.06 mg/kg	all soil samples below 0.6 mg/kg
Manganese	-0.05 mg/kg	no impact
Silver	-0.08 mg/kg	all soil samples below 0.8 mg/kg
Thallium	-0.34 mg/kg	all soil samples below 3.4 mg/kg
Antimony	-3.54 ug/l	all SPLP samples below 35.4 ug/l
Beryllium	-0.56 ug/l	all SPLP samples below 5.6 ug/l
Cadmium	-1.13 ug/l	all SPLP samples below 11.3 ug/l
Copper	-1.0 ug/l	all SPLP samples below 10.0 ug/l
Nickel	-1.79 ug/l	all SPLP samples below 17.9 ug/l
Selenium	-5.3 ug/l	all SPLP samples below 53.0 ug/l
Silver	-0.71 ug/l	all SPLP samples below 7.1 ug/l
Thallium	-5.7 ug/l	all SPLP samples below 57.0 ug/l

This reviewer qualifies all samples results below 10 times the absolute value of the negative blank value.

Matrix Spike Recovery results

The matrix spike recovery for soils for Antimony (52%) was below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

The matrix spike recovery for soils for Cadmium (133%) was above the upper control limits (>125%). All positive results are qualified as estimated, "J".

Matrix Duplicate results

The matrix duplicate RPD results for soils for Calcium (52%) was greater than 35% and for SPLP samples for Iron was greater than 35%. All positive results are qualified as estimated, "J". The RPD for soils for Antimony (23%) was below 35% and will not be

qualified.

Field Duplicate results

The field duplicate RPD results for splp samples for samples 162SB002S1 and 162CB002S1 for Aluminum (53%) was greater than 35%. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Serial Dilution recovery results

The serial dilution results for soils for Zinc and for SPLP samples for Aluminum and Magnesium were greater than 10%. All positive results are qualified as estimated, "J".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 7.2 mg/kg	Sn.	+	U
all SPLP samples below 231 ug/l	Al.		
all SPLP samples below 6.7 ug/l	Ba.		
all SPLP samples below 1165 ug/l	Ca.		
all SPLP samples below 3.05 ug/l	Cu.		
all SPLP samples below 96.5 ug/l	Fe.		
all SPLP samples below 555 ug/l	Mg.		
all SPLP samples below 324 ug/l	K.		
all SPLP samples below 33.5 ug/l	Zn.		
all soil samples below 0.6 mg/kg	Be.	+/U	J/UJ
all soil samples below 0.6 mg/kg	Cd.		
all soil samples below 0.8 mg/kg	Ag.		
all soil samples below 3.4 mg/kg	Tl.		
all SPLP samples below 35.4 ug/l	Sb.		
all SPLP samples below 5.6 ug/l	Be.		
all SPLP samples below 11.3 ug/l	Cd.		
all SPLP samples below 17.9 ug/l	Ni.		
all SPLP samples below 53.0 ug/l	Se.		
all SPLP samples below 7.1 ug/l	Ag.		
all SPLP samples below 57.0 ug/l	Tl.		
all soil samples	Sb.	+/U	J/UJ
all soil samples	Ca.	+	J
all soil samples	Ca.	+	J
all SPLP samples	Fe.		
162SB002S1 and 162CB002S1 (SPLP)	Al.	+/U	J/UJ
all soil samples	Zn.	+	J
all SPLP samples	Al and Mg.		
all "B" results	all analytes	B	J

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, LANCASTER, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 3
PROJECT/JOB NO 2911- -09-000-0
COC NO.
PO NO 2
REL. NO. 82
LAB NAME. Savannah Labs

CLIENT CNC
LOCATION Zone K
SAMPLERS (SIGNATURE) Shelly Hughes
PROJECT MANAGER Steve Parker
TELE/FAX NO 270-744-0110/803-747-0336

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	SPLP SVOC 8270	8270 + TICS	SPLP Metals	TAL-Metals + TIN	SPLP PEST 8081	PEST 8081	TOC 9080			REMARKS
164SB002S2	10-12-99	11:50	S	250ml plastic	4°	—	1			X							
164SB002T2	"	"	S	" "		—	2				X			X			
164SB006S1	"	12:05	S	" "		—	1			X							
164SB006T1	"	"	S	" "		—	2				X			X			
164SB006S2	"	12:15	S	" "		—	1			X							
164SB006T2	"	"	S	" "		—	2				X			X			
164SB005S2	"	12:25	S	" "		—	1			X							
164SB005T2	"	"	S	" "		—	2				X			X			
164SB004S1	"	12:35	S	250ml glass	4°	—	1	X									
164SB004T1	"	"	S	" "		—	2		X					X			
164SB004S2	"	12:45	S	" "		—	1	X									
164SB004T2	"	"	S	" "		—	2		X					X			
161SB008S1	"	2:20	S	250ml plastic		—	1			X							
161SB008T1	"	"	S	" "		—	2				X			X			PUSH
161SB008S2	"	2:25	S	" "		—	1			X							
161SB008T2	"	"	S	" "		—	2				X			X			99-16864

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
SP	10-12-99	C. Vasquez	10/13/99				
PRINTED STEVE PARKER	TIME 1720	PRINTED C. Vasquez	TIME 8:15	PRINTED	TIME	PRINTED	TIME
COMPANY ENSAFE		COMPANY STL-SKV		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO. 809609601 80
SEND RESULTS TO:

COMMENTS: Complete COC w/ each cooler
Turn around time: 14 days

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV 05/99

000004

EnSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, LANCASTER, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 2 OF 3

PROJECT/JOB NO 2911-c 99-000-00

COC NO.

PO NO. 2

REL NO. 82

LAB NAME: Savannah Labs

CLIENT CNC

PROJECT MANAGER STEVE PARKER

LOCATION ZONE K

TELE/FAX NO.

SAMPLERS: (SIGNATURE) Shelly Brafe

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	SPLP SVOC 8270	SVOC 8270 ORTHO	SPLP Metals	TAL Metals + TIN	SPLP Test 8081	~~TCLP 8081~~	TOC 9080				REMARKS
163SB002S1	10-12-99	10:40	S	250ml plastic	4°	—	1			X								
163SB002T1	"	"	S	" "	4°	—	2				X			X				
163SB002S2	"	10:55	S	" "	4°	—	1			X								
163SB002T2	"	"	S	" "	4°	—	2				X			X				
163SB007S1	"	11:05	S	250ml glass	4°	—	1	X										
163SB007T1	"	"	S	" "	4°	—	2		X					X				
163SB007S2	"	11:10	S	" "	4°	—	1	X										
163SB007T2	"	"	S	" "	4°	—	2		X					X				
163SB008S2	"	11:15	S	250ml glass	4°	—	1	X										
163SB008T2	"	"	S	" "	4°	—	2		X					X				
164SB001S1	"	11:20	S	250ml plastic	4°	—	1			X								
164SB001T1	"	"	S	" "	4°	—	2				X			X				
164SB001S2	"	11:30	S	" "	4°	—	1			X								
164SB001T2	"	"	S	" "	4°	—	2				X			X				
164SB002S1	"	11:40	S	" "	4°	—	1			X								99-16864
164SB002T1	"	"	S	" "	4°	—	2				X			X				

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
	10-12-99		10/13/99				
PRINTED Steve Parker	TIME 1720	PRINTED	TIME 0945	PRINTED	TIME	PRINTED	TIME
COMPANY EnSafe		COMPANY		COMPANY		COMPANY	

METHOD OF SHIPMENT: Fedex

SHIPMENT NO. 8096096 0180

SEND RESULTS TO:

COMMENTS: Complete COC w/ each cooler
14 day Turn around time

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

000003

13

EnSAFE

800-388-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, LANCASTER, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 3 OF 3
PROJECT/JOB NO. 2911.001 .000.00
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: CNC
LOCATION: Zone K
SAMPLERS. (SIGNATURE): Shelly Brazfas
PROJECT MANAGER: Steve Parker
TELE/FAX NO. 270-744-0110/803-747-0336

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SPLP SVOC 8270	8270 TICs	SPLP metals	TAL metals + TIN	SPLP PEST 8081	PEST 8081	TOC 9080				REMARKS
162SB002S1	10-12-99	2:40	S	250ml glass/plast	4°	—	3	X		X		X						
162SB002T1	"	"	S	250ml glass/plast	4°	—	4		X		X		X	X				
162CB002S1	"	2:40	S	250ml glass/plast	4°	—	3	X		X		X						
162CB002T1	"	"	S	" "	4°	—	4		X		X		X	X				
162SB002S2	"	2:45	S	" "	4°	—	3	X		X		X						
162SB002T2	"	"	S	" "	4°	—	4		X		X		X	X				
162SB009S1	"	2:50	S	250ml plastic	4°	—	1			X								
162SB009T1	"	"	S	" "	4°	—	2				X			X				
162SB009S2	"	2:55	S	" "	4°	—	1			X								
162SB009T2	"	"	S	" "	4°	—	2				X			X				

10/12/99

SR16864

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Shelly	10-12-99	C. Vasquez	10/13/99				
PRINTED: STEVE PARKER	TIME: 1720	PRINTED: C. Vasquez	TIME: 9:15	PRINTED:	TIME	PRINTED:	TIME
COMPANY: EnSafe		COMPANY: SIL-SAV.		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO. 809160960180
SEND RESULTS TO

COMMENTS: Complete Chain w/each cooler
Turn around time - 14 days

114

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOR 2

SAMPLE RESULT VERIFICATION
SEMIVOLATILE ORGANIC FRACTION

1. Were the sample results reported within the calibration range? Yes No

2. Were the percent moistures reported? Yes No NR

3. Were the data reported on a dry weight basis? Yes No NR

4. Did the GC/MS RIC and TIC exhibit interferences, off scale peaks or elevated baseline? Level 3 - no chromatograms or raw data Yes No

5. Did the data contain elevated detection limits that could not be accounted for? Yes No

6. Were any computational or transcription errors found? Yes No

Specific Comments:

* For the RE samples do not report the following in favor of the original analysis results: 1G35B007T2RE, 1G3CB002S1RE. Both analyses exhibited similar QC results.

Reviewer: Angeline A Cleveland Date: 11/17/99

ENSAFE

800-558-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 29 11-00 - 01-000
COC NO: 0061
PO NO: 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: CNA
LOCATION: Zone K
SAMPLERS (SIGNATURE): Shelly Broyles
PROJECT MANAGER: Steve Parker
TELE/FAX NO.: 270-744-0110/803-747-0336

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	SPLP SVOC 8270	8270 + TICS	SPLP Metals	TAL-Metals + TIN	SPLP PEST 8081	PEST 8081	TOC 9060				REMARKS
164SB002S2	10-12-99	11:50	S	250ml plastic	4°	—	1				X							
164SB002T2	"	"	S	" "		—	2			X				X				
164SB006S1	"	12:05	S	" "		—	1				X							
164SB006T1	"	"	S	" "		—	2			X				X				
164SB006S2	"	12:15	S	" "		—	1				X							
164SB006T2	"	"	S	" "		—	2			X				X				
164SB005S2	"	12:25	S	" "		—	1				X							
164SB005T2	"	"	S	" "		—	2			X				X				
164SB004S1	"	12:35	S	250ml glass	4°	—	1	X										
164SB004T1	"	"	S	" "		—	2		X					X				
164SB004S2	"	12:45	S	" "		—	1	X										
164SB004T2	"	"	S	" "		—	2		X					X				
161SB008S1	"	2:20	S	250ml plastic		—	1				X							
161SB008T1	"	"	S	" "		—	2			X				X				
161SB008S2	"	2:25	S	" "		—	1				X							
161SB008T2	"	"	S	" "		—	2			X				X				

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Shelly	10-12-99	C. Vasquez	10/13/99				
PRINTED: STEVE PARKER	TIME 1720	PRINTED: C. Vasquez	TIME 8:15	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: STL-SAV.		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FED EX
SHIPMENT NO.: 809609160180
SEND RESULTS TO:

COMMENTS: Complete COC w/each cooler
Turn around time: 14 days

ANALYTICAL DATA RECEIVED BY (INITIALS/DAT

ENSCOC2
REV 05/90

FINDS
SQ-16869

EnSafe

[illegible]-388-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUS DY RECORD

PROJECT/JOB NO: 2911-0[illegible]
COC NO.
PO NO: 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: CVC
LOCATION: Zone K
SAMPLERS: (SIGNATURE) Shelley Brafe
PROJECT MANAGER: Steve Parker
TELE/FAX NO.

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SPLP SVOC 8270	SVOC 8270	SPLP Metals	TAL Metals + TIN	SPLP Pest 8081	~~TOC 9080~~ 9081	TOC 9080				REMARKS
163SB00251	10-12-99	10:40	S	250ml plastic	4°	—	1			X								
163SB002T1	"	"	S	" "	4°	—	2				X			X				
163SB00252	"	10:55	S	" "	4°	—	1			X								
163SB002T2	"	"	S	" "	4°	—	2				X			X				
163SB00751	"	11:05	S	250ml glass	4°	—	1	X										
163SB007T1	"	"	S	" "	4°	—	2		X					X				
163SB00752	"	11:10	S	" "	4°	—	1	X										
163SB007T2	"	"	S	" "	4°	—	2		X					X				
163SB00852	"	11:15	S	250ml glass	4°	—	1	X										
163SB008T2	"	"	S	" "	4°	—	2		X					X				
164SB00151	"	11:20	S	250ml plastic	4°	—	1			X								
164SB001T1	"	"	S	" "	4°	—	2				X			X				
164SB00152	"	11:30	S	" "	4°	—	1			X								
164SB001T2	"	"	S	" "	4°	—	2				X			X				
164SB00251	"	11:40	S	" "	4°	—	1			X								39-16564
164SB002T1	"	"	S	" "	4°	—	2				X			X				

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	10-12-99	[signature]	10/13/99				
PRINTED: Steve Parker	TIME 1720	PRINTED:	TIME 9:15	PRINTED	TIME	PRINTED:	TIME
COMPANY: EnSafe		COMPANY:		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fedex
SHIPMENT NO. 809609601180
SEND RESULTS TO:

COMMENTS: Complete COC w/ each cooler
14 day Turn around time

ANALYTICAL DATA RECEIVED BY (INITIALS/DA

ENSCOC2
REV. 05/90

[illegible]
[illegible]-388-7962
MEMPHIS, TENNESSEE
HARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON TN, KNOXVILLE, TN,
LANCASTER, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL
RALEIGH NC, COLOGNE, GERMANY

CHAIN OF CUST[illegible]DY RECORD

PROJECT/JOB NO: 2411.001.[illegible] .000.00
COC NO: 19
PO NO. 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: C[illegible]
LOCATION: Tome K
SAMPLERS (SIGNATURE): Shelly Brayfos
PROJECT MANAGER: Steve Parker
TELE/FAX NO. 270-744-0110/803-747-0336

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	SPLP SVOC-8270	8270 +TICs	SPLP Metals	TAL Metals + TIN	SPLP PEST 8081	PEST 8081	TOC 9080				REMARKS
162SB002S1	10-12-99	2:40	S	250ml /glass/plast	4°	—	3	X		X		X						
162SB002T1	"	"	S	250ml glass/plast.	4°	—	4		X		X		X	X				
162CB002S1	"	2:40	S	250ml glass/plast.	4°	—	3	X		X		X						
162CB002T1	"	"	S	" "	4°	—	4		X		X		X	X				
162SB002S2	"	2:45	S	" "	4°	—	3	X		X		X						
162SB002 T2	"	"	S	" "	4°	—	4		X		X		X	X				
162SB009 S1	"	2:50	S	250ml plastic	4°	—	1			X								
162SB009 T1	"	"	S	" "	4°	—	2				X			X				
162SB009 S2	"	2:55	S	" "	4°	—	1			X								
162SB009T2	"	"	S	" "	4°	—	2				X			X				

10/12/99

SP16864

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	10-12-99	C. Vasquez	10/13/99				
PRINTED: STEVE PARKER	TIME 1720	PRINTED: C. Vasquez	TIME 9:15	PRINTED	TIME	PRINTED	TIME
COMPANY: EN Safe		COMPANY: STL-SAV.		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO: 8097609601 80
SEND RESULTS TO

COMMENTS: Complete Chain w/ each cooler
Turn around time - 14 days

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCIX.2
REV. 05/98

MULTI-MEDIA PESTICIDE/AROCLOR FRACTION

SAMPLE RESULT VERIFICATION

1. Were the sample results reported within the calibration range (YES/NO)? YES

2. Was the percent moisture reported for all soil samples (YES/NO/NA)? YES

3. Was the data reported on a dry weight basis (YES/NO/NA)? YES

4. Did the GC chromatograms exhibit interferences, off scale peaks or elevated baseline (YES/NO)? Chromatograms were not included

5. Did the data contain elevated detection limits that could not be verified (YES/NO)?NO

6. Were any computational or transcription errors found (YES/NO)? NO

Specific Comments:

P flags

Reviewer Erica K Ketchum **Date:** 11/17/99

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN
LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL
RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 2911-0 88-000-2
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: CNC
LOCATION: Zone K
SAMPLERS: (SIGNATURE) Shelly Broyles
PROJECT MANAGER: Steve Parker
TELE/FAX NO. 270-744-0110/803-744-0336

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SPLP SVOC 8270	8270 + TICS	SPLP Metals	TAL-Metals + TIN	SPLP PEST 8081	PEST 8081	TOC 9080				REMARKS
164SB002S2	10-12-99	11:50	S	250ml plastic	4°	—	1			X								
164SB002T2	"	"	S	" "		—	2				X			X				
164SB006S1	"	12:05	S	" "		—	1			X								
164SB006T1	"	"	S	" "		—	2				X			X				
164SB006S2	"	12:15	S	" "		—	1			X								
164SB006T2	"	"	S	" "		—	2				X			X				
164SB005S2	"	12:25	S	" "		—	1			X								
164SB005T2	"	"	S	" "		—	2				X			X				
164SB004S1	"	12:35	S	250ml glass	4°	—	1	X										
164SB004T1	"	"	S	" "		—	2		X					X				
164SB004S2	"	12:45	S	" "		—	1	X										
164SB004T2	"	"	S	" "		—	2		X					X				
161SB008S1	"	2:20	S	250ml plastic		—	1			X								
161SB008T1	"	"	S	" "		—	2				X			X				PUSH
161SB008S2	"	2:25	S	" "		—	1			X								
161SB008T2	"	"	S	" "		—	2				X			X				SA-16864

RELINQUISHER	DATE	TIME	RECEIVER	DATE	TIME
[signature]	10-12-99	1720	[signature]	10/13/99	0915
PRINTED: STEVE PARKER			PRINTED: [illegible]		
COMPANY: ENSAFE			COMPANY: STL-SAV.		

RELINQUISHER	DATE	TIME	RECEIVER	DATE	TIME
PRINTED:			PRINTED:		
COMPANY:			COMPANY:		

METHOD OF SHIPMENT: FED EX
SHIPMENT NO. 809609160180
SEND RESULTS TO

COMMENTS: Complete COC w/each cooler
Turn around time - 14 days

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/90

EN SAFE

800-388-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 2911-001 ~~19800-00~~ 28
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: CNC
PROJECT MANAGER: STEVE PARKER
LOCATION: ZONE K
TELE/FAX NO.:
SAMPLERS (SIGNATURE): Shelley Brafle

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SPLP SVOC 8270	SVOC 8270 ONLY	SPLP Metals	TAL Metals + TIN	SPLP Pest 8081	~~TPH 9080~~ 8081	TPH 9080				REMARKS
63SB00251	10-12-99	10:40	S	250ml plastic	4°	—	1			X								
63SB002T1	"	"	S	" "	4°	—	2				X			X				
63SB00252	"	10:55	S	" "	4°	—	1			X								
63SB002T2	"	"	S	" "	4°	—	2				X			X				
63SB00751	"	11:05	S	250ml glass	4°	—	1	X										
63SB007T1	"	"	S	" "	4°	—	2		X					X				
63SB00752	"	11:10	S	" "	4°	—	1	X										
63SB007T2	"	"	S	" "	4°	—	2		X					X				
63SB00852	"	11:15	S	250ml glass	4°	—	1	X										
63SB008T2	"	"	S	" "	4°	—	2		X					X				
64SB00151	"	11:20	S	250ml plastic	4°	—	1			X								
64SB001T1	"	"	S	" "	4°	—	2				X			X				
64SB00152	"	11:30	S	" "	4°	—	1			X								
64SB001T2	"	"	S	" "	4°	—	2				X			X				
64SB00251	"	11:40	S	" "	4°	—	1			X								39-16864
64SB002T1	"	"	S	" "	4°	—	2				X			X				

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
Signature: [signature]	DATE 10-12-99	Signature: [signature]	DATE 10/13/99	Signature:	DATE	Signature:	DATE
Printed: STEVE PARKER	TIME 1720	Printed:	TIME 9:15	Printed:	TIME	Printed:	TIME
Company: EnSafe		Company:		Company:		Company:	

METHOD OF SHIPMENT: Fedex
SHIPMENT NO. 807609601180
SEND RESULTS:

COMMENTS: Complete COC w/ eqd cooler
14 day Turn around time

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 03/98

000003

EN SAFE

800-558-7962
MEMPHIS, TENNESSEE
STON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN;
TER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL;
RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTOD , RECORD

PROJECT/JOB NO: 2911.001.01 .00
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah Labs

ENT: CNC
CATION: Zone K
PROJECT MANAGER: Steve Parker
TELE/FAX NO.: 270.744.0110/803.747.0336
MPLERS: (SIGNATURE): Shelly Broyles

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SPLP SVOC 8270	8270 TICs	SPLP Metals	TAL Metals + TIN	SPLP PEST 8081	PEST 8081	TOC 9080				REMARKS
2SB002S1	10-12-99	2:40	S	250ml glass/plast	4°	—	3	X		X		X						
2SB002T1	"	"	S	250ml glass/plast.	4°	—	4		X		X		X	X				
2CB002S1	"	2:40	S	250ml glass/plast.	4°	—	3	X		X		X						
2CB002BT1	"	"	S	" "	4°	—	4		X		X		X	X				
2SB002S2	"	2:45	S	" "	4°	—	3	X		X		X						
2SB002T2	"	"	S	" "	4°	—	4		X		X		X	X				
2SB009S1	"	2:50	S	250ml plastic	4°	—	1			X								
2SB009T1	"	"	S	" "	4°	—	2				X			X				
2SB009S2	"	2:55	S	" "	4°	—	1			X								
2SB009T2	"	"	S	" "	4°	—	2				X			X				

10/12/99

SP16864

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
SP	10-12-99	C. Vasquez	10/12/99				
PRINTED: STEVE PARKER	TIME 1720	PRINTED C. Vasquez	TIME 9:15	PRINTED:	TIME	PRINTED:	TIME
COMPANY: EN Safe		COMPANY: STL-SAV		COMPANY:		COMPANY:	

HOD OF SHIPMENT: FEDEX
MENT NO. 8071 0960180
D RESULTS TO:

COMMENTS: Complete Chain w/ each cooler
Turn around time - 14 days

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/98

000004

ENSAFE

ENSAFE/ROY F. WESTON
MEMPHIS, TENNESSEE
HARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN, MCALESTER, PA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL, RALEIGH, NC, COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 2911-00 2851-000-
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: CNC
LOCATION: Zone K
SAMPLERS: (SIGNATURE) Shelly Bragles
PROJECT MANAGER: Steve Parker
TELE/FAX NO. 270-744-0110/803-747-0336

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	SPLP SVOC 8270	8270 + TICS	SPLP Metals	TAL-Metals + TIN	SPLP PEST 8081	PEST 8081	TOC 9060				REMARKS
164SB002S2	10-12-99	11:50	S	250ml plastic	4°	—	1			X								
164SB002T2	"	"	S	" "		—	2				X			X				
164SB006S1	"	12:05	S	" "		—	1			X								
164SB006T1	"	"	S	" "		—	2				X			X				
164SB006S2	"	12:15	S	" "		—	1			X								
164SB006T2	"	"	S	" "		—	2				X			X				
164SB005S2	"	12:25	S	" "		—	1			X								
164SB005T2	"	"	S	" "		—	2				X			X				
164SB004S1	"	12:35	S	250ml glass	4°	—	1	X										
164SB004T1	"	"	S	" "		—	2		X					X				
164SB004S2	"	12:45	S	" "		—	1	X										
164SB004T2	"	"	S	" "		—	2		X					X				
161SB008S1	"	2:20	S	250ml plastic		—	1			X								
161SB008T1	"	"	S	" "		—	2				X			X				PAUSE
161SB008S2	"	2:25	S	" "		—	1			X								
161SB008T2	"	"	S	" "		—	2				X			X				SV-16869

RELINQUISHER	DATE	TIME	RECEIVER	DATE	TIME
SPR	10-12-99	1720	C. Vasquez	10/13/99	0915
STEVE PARKER			C. Vasquez		
ENSAFE			STL-SAV.		

RELINQUISHER	DATE	TIME	RECEIVER	DATE	TIME
PRINTED			PRINTED		
COMPANY			COMPANY		

METHOD OF SHIPMENT: FED EX
SHIPMENT NO. 809 609 601 80
SEND RESULTS TO:

COMMENTS: Complete COC w/ each cooler
Turn around time - 14 days

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/90

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 2911-05
COC NO: 28
PO NO: 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: C.C.
LOCATION: [illegible]
SAMPLERS: (SIGNATURE) Shelley Brazfe

PROJECT MANAGER: STEVE PARKER
TELE/FAX NO.:

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	SPLP & VOC 8270	SVOC 8270	SPLP Metals	TAL Metals + TIN	SPLP Pest 8081	~~TOC 9080~~	TOC 9080				REMARKS
163SB00251	10-12-99	10:40	S	250ml plastic	4°	—	1			X								
163SB002T1	"	"	S	" "	4°	—	2				X			X				
163SB00252	"	10:55	S	" "	4°	—	1			X								
163SB002T2	"	"	S	" "	4°	—	2				X			X				
163SB00751	"	11:05	S	250ml glass	4°	—	1	X										
163SB007T1	"	"	S	" "	4°	—	2		X					X				
163SB00752	"	11:10	S	" "	4°	—	1	X										
163SB007T2	"	"	S	" "	4°	—	2		X					X				
163SB00852	"	11:15	S	250ml glass	4°	—	1	X										
163SB008T2	"	"	S	" "	4°	—	2		X					X				
164SB00151	"	11:20	S	250ml plastic	4°	—	1			X								
164SB001T1	"	"	S	" "	4°	—	2				X			X				
164SB00152	"	11:30	S	" "	4°	—	1			X								
164SB001T2	"	"	S	" "	4°	—	2				X			X				
164SB00251	"	11:40	S	" "	4°	—	1			X								59-16564
164SB002T1	"	"	S	" "	4°	—	2				X			X				

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	10-12-99	[signature]	10/13/99				
PRINTED: STEVE PARKER	TIME: 1720	PRINTED:	TIME: 9:15	PRINTED:	TIME	PRINTED:	TIME
COMPANY: EnSafe		COMPANY:		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fedex
SHIPMENT NO.: 8096096 0180
SEND RESULTS TO:

COMMENTS: Complete COC w/ cooler
14 day Turn around time

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/98

EN SAFE

800-[illegible]
[illegible]
CHARLESTON, SC, CINCINNATI, OH, DALLAS, TX, JACKSON, TN, KNOXVILLE, TN
LAFAYETTE, LA, NASHVILLE, TN, NORFOLK, VA, PADUCAH, KY, PENSACOLA, FL
RALEIGH, NC COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 2911.001.01 00.00
COC NO: 287
PO NO. 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: [illegible]
LOCATION: Tonopah
SAMPLERS: (SIGNATURE) Shelly Brayfox

PROJECT MANAGER: Steve Parker
TELE/FAX NO. 270-744-0110/803-741-0336

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SPLP SVOC 8270	8270 +TICs	SPLP Metals	THM+Alk+TIN	SPLP PEST 8081	PEST 8081	TOC 9080				REMARKS
162SB002S1	10-12-99	2:40	S	250ml /glass/plast	4°	—	3	X		X		X						
162SB002T1	"	"	S	250ml glass/plast	4°	—	4		X		X		X	X				
162CB002S1	"	2:40	S	250ml glass/plast	4°	—	3	X		X		X						
162CB002T1	"	"	S	" "	4°	—	4		X		X		X	X				
162SB002S2	"	2:45	S	" "	4°	—	3	X		X		X						
162SB002T2	"	"	S	" "	4°	—	4		X		X		X	X				
162SB009S1	"	2:50	S	250ml plastic	4°	—	1			X								
162SB009T1	"	"	S	" "	4°	—	2				X			X				
162SB009S2	"	2:55	S	" "	4°	—	1			X								
162SB009T2	"	"	S	" "	4°	—	2				X			X				

10/12/99

S216864

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	10-12-99	C. Vasquez	10/13/99				
PRINTED: STEVE PARKER	TIME 1720	PRINTED: C. Vasquez	TIME 9:15	PRINTED	TIME	PRINTED:	TIME
COMPANY: En Safe		COMPANY: STL-SAV.		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO. 8077609601 80
SEND RESULTS TO:

COMMENTS: Complete Chain w/ each cooler
Turn around time - 14 days

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSOC2
REV. 05/98

ENSAFE

800-388-7862
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

PROJECT/JOB NO: 29 91-09-00
COC NO:
PO NO. 2
REL NO. 82
LAB NAME. Savannah Labs

CLIENT CNC
LOCATION Zone K
SAMPLERS: (SIGNATURE) Shelly Hughes

PROJECT MANAGER Steve Parker
TELE/FAX NO. 270-744-0110/803-741-0336

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO OF CONTAINERS	SPLP SVOC 8270	8270 + TICS	SPLP Metals	TCL-Metals + TIN	SPLP PEST 8081	TOC 9060	REMARKS
164SB002S2	10-12-99	11:50	S	250 ml plastic	4°	—	1			X				
164SB002T2	"	"	S	" "		—	2				X		X	
164SB006S1	"	12:05	S	" "		—	1			X				
164SB006T1	"	"	S	" "		—	2				X		X	
164SB006S2	"	12:15	S	" "		—	1			X				
164SB006T2	"	"	S	" "		—	2				X		X	
164SB005S2	"	12:25	S	" "		—	1			X				
164SB005T2	"	"	S	" "		—	2				X		X	
164SB004S1	"	12:35	S	250 ml glass	4°	—	1	X						
164SB004T1	"	"	S	" "		—	2		X				X	
164SB004S2	"	12:45	S	" "		—	1	X						
164SB004T2	"	"	S	" "		—	2		X				X	
161SB008S1	"	2:20	S	250 ml plastic		—	1			X				
161SB008T1	"	"	S	" "		—	2				X		X	PASSED
161SB008S2	"	2:25	S	" "		—	1			X				
161SB008T2	"	"	S	" "		—	2				X		X	99-16864

RELINQUISHER:	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER:	DATE
Steve Parker	10-12-99	C. Vasquez	10/13/99				
PRINTED: STEVE PARKER	TIME 1720	PRINTED: C. Vasquez	TIME 9:15	PRINTED.	TIME	PRINTED.	TIME
COMPANY: ENSAFE		COMPANY: STL-SAV.		COMPANY.		COMPANY	

METHOD OF SHIPMENT: FED EX
SHIPMENT NO. 8096 0916 01 80
SEND RESULTS TO:

COMMENTS: Complete COC w/ each cooler
Turn around time - 14 days

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSUIC2
REV 05/98

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF C STODY RECORD

PAGE ___ OF ___

PROJECT/JOB NO. 2911 1-09-000-00
COC NO:
PO NO. 2
REL NO: 82
LAB NAME: Savannah Labs

CLIENT: CNC
PROJECT MANAGER: STEVE PARKER
LOCATION: ZONE K
TELE/FAX NO.:
SAMPLERS: (SIGNATURE) Shelley Bragg

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SPLP SVOC 8270	SVOC 8270	SPLP Metals	TAL Metals + Tin	SPLP Pest 8081	~~TCL 9080~~	TCL 9080				REMARKS
163SB00251	10-12-99	10:40	S	250ml plastic	4°	—	1			X								
163SB002T1	"	"	S	" "	4°	—	2				X			X				
163SB00252	"	10:55	S	" "	4°	—	1			X								
163SB002T2	"	"	S	" "	4°	—	2				X			X				
163SB00751	"	11:05	S	250ml glass	4°	—	1	X										
163SB007T1	"	"	S	" "	4°	—	2		X					X				
163SB00752	"	11:10	S	" "	4°	—	1	X										
163SB007T2	"	"	S	" "	4°	—	2		X					X				
163SB00852	"	11:15	S	250ml glass	4°	—	1	X										
163SB008T2	"	"	S	" "	4°	—	2		X					X				
164SB00151	"	11:20	S	250ml plastic	4°	—	1			X								
164SB001T1	"	"	S	" "	4°	—	2				X			X				
164SB00152	"	11:30	S	" "	4°	—	1			X								
164SB001T2	"	"	S	" "	4°	—	2				X			X				
164SB00251	"	11:40	S	" "	4°	—	1			X								99-16864
164SB002T1	"	"	S	" "	4°	—	2				X			X				

RELINQUISHER:	DATE 10-12-99	RECEIVER:	DATE 10/13/99	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: STEVE PARKER	TIME 1720	PRINTED:	TIME 0715	PRINTED:	TIME	PRINTED:	TIME
COMPANY: EnSafe		COMPANY:		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fedex
SHIPMENT NO. 8096096 0180
SEND RESULTS TO:

COMMENTS: Complete COC w/ qcd cooler
14 day Turn around time

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV 05/98

ENSAFE

800-388-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 2 OF 2

PROJECT/JOB NO. 2911.01 19.000.00
COC NO.
PO NO: 2
REL NO. 82
LAB NAME: Savannah Labs

CLIENT: CNC
LOCATION: Zone K
SAMPLERS. (SIGNATURE): Shelly Broyles

PROJECT MANAGER: Steve Parker
TELE/FAX NO. 270-744-0110/803-747-0336

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	CPLP SVOC	8270 TICS	SPLP metals	TAL metals + TIN	SPLP PEST	PEST 8081	TOC 9060				REMARKS
1625B002S1	10-12-99	2:40	S	250ml glass/plast	4°	—	3	X		X		X						
1625B002T1	"	"	S	250ml glass/plast	4°	—	4		X		X		X	X				
1625CB002S1	"	2:40	S	250ml glass/plast	4°	—	3	X		X		X						
1625CB002BT1	"	"	S	" "	4°	—	4		X		X		X	X				
1625B002S2	"	2:45	S	" "	4°	—	3	X		X		X						
1625B002T2	"	"	S	" "	4°	—	4		X		X		X	X				
1625B009S1	"	2:50	S	250ml plastic	4°	—	1			X								
1625B009T1	"	"	S	" "	4°	—	2				X			X				
1625B009S2	"	2:55	S	" "	4°	—	1			X								
1625B009T2	"	"	S	" "	4°	—	2				X			X				

10/12/99

PAUCAP

SP16824

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Signature	10-12-99	C. Vasquez	10/13/99				
PRINTED: STEVE PARKER	TIME 1720	PRINTED: C. Vasquez	TIME 8:15	PRINTED	TIME	PRINTED	TIME
COMPANY: EN Safe		COMPANY: SIL-SAV.		COMPANY		COMPANY	

METHOD OF SHIPMENT: FEDEX
SHIPMENT NO. 8091609601 80
SEND RESULTS TO:

COMMENTS: Complete Chain w/ ecol cooler
Turnaround time - 14 days

315

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV 05/98

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	NBCK08
Date:	January 6, 2000
Client Name:	Ensafe
Project/Site Name:	Charleston Zone K
Date Sampled:	November 18, 1999
Number of Samples:	20 Non-Aqueous Sample(s) with 0 MS/MSD(s) 1 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Simpson

Paul B. Humburg, President

1-11-00.

Date

4127 Plaza 94 South • St Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# NBCK08

Samples and Fractions Reviewed

Sample Identifications | Analytical Fractions

ENSAFE ID	MATRIX	VOA		SVOA		MET	
163SB01101	SOIL				X		
163SB01102	SOIL				X		
163SB01401	SOIL				X		
163SB01402	SOIL				X		
163SB01501	SOIL				X		
163SB01502	SOIL				X		
163SB01601	SOIL				X		
163SB01602	SOIL				X		
164SB01501	SOIL		X				X
164SB02501	SOIL		X		X		
164SB02502	SOIL		X		X		
164SB02601	SOIL		X		X		
164SB02602	SOIL		X		X		
164SB02701	SOIL		X		X		
164SB02702	SOIL		X		X		
164SB02801	SOIL		X		X		
164CB02801	SOIL		X		X		
164SB02802	SOIL		X		X		
164SB02901	SOIL		X		X		
164TB02901	WATER	X					
164SB02902	SOIL		X		X		
Total Billable Samples (Water/Soil)		1	12	0	19	0	1

VOA= Volatiles
SVOA= Semivolatiles
MET= Metals

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260; the National Functional Guidelines for Organic Data Validation, 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK08

A validation was performed on the Volatile Data from SDG NBCK08. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Internal Standard Performance
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration analyzed on 11/30/99 exhibited a non compliant %D for one compound greater than 50%, but less than 90%. For the samples and compound listed below, qualify the non detect results as estimated (UJ).

All samples	vinyl acetate (76.0%)

Blanks

Blank ID	Compound	Conc.	Action Limit (10X)
164EB03001	acetone	28	280
164FB03001	acetone	25	250
164DB03001	acetone	25	250

Sample ID	Compound	Conc.	Qualifier	Assoc. Blank
164SB01501	acetone	5.3	CRQL	164EB03001
164SB02701		5.6		
164SB02901		15		

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
164SB01501	acetone	+J	CRQL
164SB02701			
164SB02901			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270; the National Functional Guidelines for Organic Data Validation, 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # NBCK08

A validation was performed on the Semivolatile Data from SDG NBCK08. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Internal Standard Performance
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Blanks

Blank ID	Compound	Conc.	Action Limit (5X)
1129D-DMB	benzyl(g,h,i)perylene	60	300

Sample ID	Compound	Conc.	Qualifier	Assoc. Blank
163SB01601	benzyl(g,h,i)perylene	60JB	CRQL	1129D-DMB

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
163SB01601	benzyl(g,h,i)perylene	JB	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # NBCK08

A validation was performed on the Metals for soils Data from SDG BNCK08. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
*	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	2.91 mg/kg	no impact
Calcium	1.74 mg/kg	no impact
Iron	2.45 mg/kg	no impact
Potassium	2.7 mg/kg	no impact
Sodium	13.6 mg/kg	all soil samples below 68.0 mg/kg
Zinc	0.65 mg/kg	no impact
Tin	1.62 mg/kg	all soil samples below 8.1 mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 68.0 mg/kg	Na.	+	U
all soil samples below 8.1 mg/kg	Sn.		
all "B" results	all analytes	B	J

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 4
PROJECT/JOB NO: 2911-00 000-00
COC NO
PO NO: 2
REL NO. 82
LAB NAME: Savanah

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Verney
LOCATION: Zone K
TELE/FAX NO: 843-884-0039/856-0107
SAMPLERS (SIGNATURE): [signature]

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOC	PCB	REMARKS
NBCK 6945B03101	11/18/99	1050	S	8oz glass SVOC, PCB 2oz Plastic Metals	4°C	None	1	X			
6945B03102		1055	S				1	X			
6945B03001		1105	S				1	X			
6945B03002		1110	S				1	X			
6945B02901		1120	S				2	X	X		
6945B02902		1125	S				2	X	X		
6945B02801		1140	S				1		X		
6945B02801		1140	S				1		X		
6945B02802		1145	S				1		X		
6945B03401		1225	S				1	X			
6945B03402		1230	S				1	X			
6945B03301		1235	S				2	X		X	
6945B03302		1240	S				2	X		X	
6945B03201		1250	S				2	X		X	
6945B03201		1250	S				2	X		X	
6945B03202		1255	S				2	X		X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
[signature]	11/18/99	[signature]	11/19/99				
PRINTED: Todd B. Temple	TIME: 1700	PRINTED: E.R. Sicay	TIME: 9:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: SIL-SAV		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FedEx
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SEND RESULTS TO:

COMMENTS: 21 Day TAT SG-1785-1A

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CHAIN OF CUSTODY RECORD

PAGE 7 OF 11

PROJECT/JOB NO: 2911 -09-000 110

COC NO:

PO NO. 2

REL NO: 82

LAB NAME: Savannah

CLIENT: NAVY CLEAN

PROJECT MANAGER: S. PARKER

LOCATION:

TELE/FAX NO.:

SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOCs	REMARKS
NACK/164SB02001	11-18-99	1510	S	8oz Plastic	4°	—	1	X		
164SB02002		1515	S	"			1	X		
164SB01901		1520					1	X		
164SB01902		1525					1	X		
164SB01801		1530					1	X		
164SB01802		1535					1	X		
164SB01701		1540					1	X		
164SB01702		1545					1	X		
164SB01601		1550					1	X		
164SB01602		1555					1	X		
164SB02101		1600		8oz Glass+Plast			2	X	X	
164CB02101		1600		"			2	X	X	
164SB02102		1610		"			2	X	X	
							11/18/99			

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Steve Parker	11-18-99	[illegible]	11/19/1				
PRINTED: Steve Parker	TIME 1700	PRINTED: [illegible]	TIME 7:30	PRINTED:	TIME	PRINTED	TIME
COMPANY: EnSafe		COMPANY: [illegible]		COMPANY:		COMPANY	

METHOD OF SHIPMENT: FEDEX

SHIPMENT NO.:

SEND RESULTS TO:

COMMENTS: 21 TAT 59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 2 OF 4

PROJECT/JOB NO. 294 1-09-000-010

COC NO:

PO NO: 2

REL NO: 82

LAB NAME: Savannah

CLIENT: Navy CLEAN

PROJECT MANAGER: S. PARKER

LOCATION: Zone K

TELE/FAX NO. 843-884-0029 / 856-0107

SAMPLERS: (SIGNATURE) SP

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Metals								REMARKS
NBCK/163SB01802	11-18-99	1300	S	8oz Plastic	4°	—	1			X								
163SB01701		1305	S				1			X								
163SB01702		1310	S				1			X								
164SB02901		1325	S	4oz Encore + 8oz Glass			3	X	X									
164SB02902		1330	S	"			3	X	X									
164SB02601		1335	S	"			3	X	X									
164TB02901		0900	W	40 ml VOA			3	X										Trip Blank
164SB02602		1345	S	Encore 4oz 8oz Glass			3	X	X									
164SB02501		1400	S	"			3	X	X									
164SB02502		1410	S	"			3	X	X									
164SB02801		1420	S	"			3	X	X									
164CB02801		1420	S	"			3	X	X									
164SB02802		1425	S	"			3	X	X									
164SB02701		1440	S	"			3	X	X									
164SB02702		1450	S	"			3	X	X									
164SB01501		1505	S	Encore 4oz 8oz Glass			3	X		X								

RELINQUISHER:	DATE	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: Steve Parker	11-18-99	PRINTED: E.R. Sicay	11/19/99	PRINTED:		PRINTED:	
COMPANY: ENSAFE	TIME 1700	COMPANY: STL-SAV	TIME 9:30	COMPANY:	TIME	COMPANY:	TIME

METHOD OF SHIPMENT:

SHIPMENT NO.

SEND RESULTS TO:

COMMENTS: 21 DAY TAT SDG-17851

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CHAIN OF CUSTODY RECORD

PAGE 4 OF 14
PROJECT/JOB NO: 2911 1-09-008 010
COC NO.
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: NAVY CLEAN
PROJECT MANAGER: S. PARKER
LOCATION:
TELE/FAX NO.:
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	Metals	SVOCs	REMARKS
NBCK/164SB02001	11-18-99	1510	S	8oz Plastic	4°	—	1	X		
164SB02002		1515	S	"			1	X		
164SB01901		1520					1	X		
164SB01902		1525					1	X		
164SB01801		1530					1	X		
164SB01802		1535					1	X		
164SB01701		1540					1	X		
164SB01702		1545					1	X		
164SB01601		1550					1	X		
164SB01602		1555					1	X		
164SB02101		1600		8oz Glass/Plastic			2	X	X	
164CB02101		1600		"			2	X	X	
164SB02102		1610		"			2	X	X	
						SP	11/18/99			

RELINQUISHER:	DATE	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: Steve Parker	TIME 1700	PRINTED: C.R. Sneed	TIME 7:30	PRINTED:	TIME	PRINTED	TIME
COMPANY: EnSafe		COMPANY: SAL		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FEDEX
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COMMENTS: 21 TAT 59-17851

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CHAIN OF CUSTODY RECORD

PAGE ___ OF ___
PROJECT/JOB NO: 2911 1-09
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savanah

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Verney
LOCATION: Zone K
TELE/FAX NO.: 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	Metals	SVOC	PCB	REMARKS
NBCK 694SB03101	11/18/99	1050	S	8oz glass 4oz, 8oz plastic = Metals	4°C	None	1	X			
694SB03102		1055	S				1	X			
694SB03001		1105	S				1	X			
694SB03002		1110	S				1	X			
694SB02901		1120	S				2	X	X		
694SB02902		1125	S				2	X	X		
694SB02B01		1140	S				1		X		
694CB02801		1140	S				1		X		
694SB02802		1145	S				1		X		
694SB03401		1225	S				1	X			
694SB03402		1230	S				1	X			
694SB03301		1235	S				2	X		X	
694SB03302		1240	S				2	X		X	
694SB03201		1250	S				2	X		X	
694CB03201		1250	S				2	X		X	
694SB03202		1255	S				2	X		X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
	11/18/99		11/19/99				
PRINTED: Todd B. Temple	TIME 1700	PRINTED: R R Sican	TIME 9:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: STL-SAV		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FedEx
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CHAIN OF CUSTODY RECORD

PAGE 5 OF 5

PROJECT/JOB NO: 2911 -09-000-00

COC NO:

PO NO: 2

REL NO: 02

LAB NAME: Savanah

CLIENT: Naval Base Charleston

PROJECT MANAGER: Charlie Verney

LOCATION: Zone K

TELE/FAX NO.: 843-884-0029/856-0107

SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOC	Metals	VOCs	REMARKS
NBCK\694SB03501	11/18/99	1330	S	SVOC/PCB = 8oz glass Metals = 8oz plastic	4°C	None	2	X	X		
NBCK\694SB03601	11/18/99	1345	S	↓	↓	↓	2	X	X		
163SB01201		0930	S	8oz Glass			1	X			
163SB01202		0935	S	"			1	X			
163SB01601		0940	S	↓			1	X			
163SB01602		0945	S				1	X			
163SB01501		0950	S				1	X			
163SB01502		0955	S				1	X			
163SB01401		1000	S				1	X			
163SB01402		1005	S	↓			1	X			
163SB01301		1015	S	8oz Glass / 8oz Plastic			2	X	X		
163CB01301		1015	S	"			2	X	X		
163SB01302		1020	S	"			2	X	X		
163SB01101		1030	S	8oz Glass			1	X			
163SB01102		1035	S	8oz Glass			1	X			
163SB01801		1255	S	8oz Plastic			1	X	X		

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Todd B. Temple	11/18/99	E.R. Sloan	11/19/99				
PRINTED: Todd B. Temple	TIME 1700	PRINTED: E.R. Sloan	TIME 9:30	PRINTED	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY: STL-SAV		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fed Ex

SHIPMENT NO.

SEND RESULTS TO:

COMMENTS: 21 DAY TAT

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CHAIN OF CUSTODY RECORD

PAGE 2 OF 4

PROJECT/JOB NO. 2911 1-09-000-010
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: Navy CLEAN
LOCATION: Zone K
SAMPLERS: (SIGNATURE) SP

PROJECT MANAGER: S. PARKER
TELE/FAX NO. 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	VOC	SVOC	Metals	REMARKS
NBCK163SB01802	11-18-99	1300	S	8oz Plastic	4°	—	1		X		
163SB01701		1305	S				1		X		
163SB01702		1310	S				1		X		
164SB02901		1325	S	4 Encore 1 8oz Glass			3	X	X		
164SB02902		1330	S	"			3	X	X		
164SB02601		1335	S	"			3	X	X		
164TB02901		0900	W	40 ml VOA		"	3	X			Trip Blank
164SB02602		1345	S	Encore 1 8oz Glass			3	X	X		
164SB02501		1400	S	"			3	X	X		
164SB02502		1410	S	"			3	X	X		
164SB02801		1420	S	"			3	X	X		
164CB02801		1420	S	"			3	X	X		
164SB02802		1425	S	"			3	X	X		
164SB02701		1440	S	"			3	X	X		
164SB02702		1450	S	"			3	X	X		
164SB01501		1505	S	Encore 1 8oz			3	X		X	

RELINQUISHER:	DATE	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
SP	11-18-99	[illegible]	11/19/99				
PRINTED: Steve Parker	TIME 1700	PRINTED: E. R. Sicny	TIME 9:30	PRINTED:	TIME	PRINTED	TIME
COMPANY: ENSAFE		COMPANY: STL-SAV		COMPANY:		COMPANY:	

METHOD OF SHIPMENT:
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 DAY TAT 59-1785 1

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE 4 OF 4

PROJECT/JOB NO: 2911- 1-01-000 00

COC NO:

PO NO: 2

REL NO: 82

LAB NAME: Sacramento

CLIENT: NAVY CLEAN

PROJECT MANAGER: S. PARKER

LOCATION:

TELE/FAX NO.:

SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	Metals	SVOCs	REMARKS
NBCK/164SB02001	11-18-99	1510	S	8oz Plastic	4°	—	1	X		
164SB02002		1515	S	"			1	X		
164SB01901		1520					1	X		
164SB01902		1525					1	X		
164SB01801		1530					1	X		
164SB01802		1535					1	X		
164SB01701		1540					1	X		
164SB01702		1545					1	X		
164SB01601		1550					1	X		
164SB01602		1555					1	X		
164SB02101		1600		8oz Glass/Plast			2	X	X	
164CB02101		1600		"			2	X	X	
164SB02102		1610		"			2	X	X	
							11/18/99			

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
Steve Parker	11-18-99	[illegible]	11/19/99				
PRINTED: Steve Parker	TIME 1700	PRINTED: [illegible]	TIME 7:30	PRINTED:	TIME	PRINTED:	TIME
COMPANY: EnSafe		COMPANY: [illegible]		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FEDEX

SHIPMENT NO.

SEND RESULTS TO:

COMMENTS: 21 TAT 59-17851

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

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CHAIN OF CUSTODY RECORD

PAGE ____ OF ____
PROJECT/JOB NO: 2911- 09-0000
COC NO:
PO NO: 2
REL NO: 82
LAB NAME: Savannah

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Verney
LOCATION: Zone K
TELE/FAX NO.: 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	SVOC	PCB	REMARKS
NBCK 694SB03101	11/18/99	1050	S	8oz glass ~~8oz~~ 8oz plastic=Metals	4°C	None	1	X			
694SB03102		1055	S				1	X			
694SB03001		1105	S				1	X			
694SB03002		1110	S				1	X			
694SB02901		1120	S				2	X	X		
694SB02902		1125	S				2	X	X		
694SB02801		1140	S				1		X		
694CB02801		1140	S				1		X		
694SB02802		1145	S				1		X		
694SB03401		1225	S				1	X			
694SB03402		1230	S				1	X			
694SB03301		1235	S				2	X		X	
694SB03302		1240	S				2	X		X	
694SB03201		1250	S				2	X		X	
694CB03201		1250	S				2	X		X	
694SB03202		1255	S				2	X		X	

RELINQUISHER	DATE	RECEIVER	DATE	RELINQUISHER	DATE	RECEIVER	DATE
PRINTED: Todd P. Temple	11/18/99	PRINTED: E.R. Scam	11/19/99	PRINTED:		PRINTED:	
COMPANY: ENSAFE	TIME 1700	COMPANY: SFL-Sav.	TIME 9:30	COMPANY:	TIME	COMPANY:	TIME

METHOD OF SHIPMENT: FedEx
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 Day TAT 59-1785-1A

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSECC2
REV. 05/98

102

ENSAFE

800-588-7983
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1
PROJECT/JOB NO. 2911 09-000-00
COC NO:
PO NO: 2
REL NO: 02
LAB NAME: Savanah

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Vernoy
LOCATION: Zone K
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO OF CONTAINERS	SVOC	Metals	VOCs	REMARKS
NBCK 694SB03501	11/18/99	1330	S	8oz/ACB = 8oz glass Metals = 8oz plastic	4°C	None	2	X	X		
NBCK 694SB03601	11/18/99	1345	S				2	X	X		
163SB01201		0930	S	8oz Glass			1	X			
163SB01202		0935	S	"			1	X			
163SB01601		0940	S				1	X			
163SB01602		0945	S				1	X			
163SB01501		0950	S				1	X			
163SB01502		0955	S				1	X			
163SB01401		1000	S				1	X			
163SB01402		1005	S				1	X			
163SB01301		1015	S	8oz Glass / 8oz Plastic			2	X	X		
163CB01301		1015	S	"			2	X	X		
163SB01302		1020	S	"			2	X	X		
163SB01101		1030	S	8oz Glass			1	X			
163SB01102		1035	S	8oz Glass			1	X			
163SB01801		1255	S	8oz Plastic			1	X	X		

RELINQUISHER:	DATE	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: Todd B. Temple	11/18/99	PRINTED: ER Sloan	11/19/99	PRINTED		PRINTED:	
COMPANY: ENSAFE	TIME 1700	COMPANY: STL-SAV	TIME 9:30	COMPANY:	TIME	COMPANY:	TIME

METHOD OF SHIPMENT: Fed Ex
SHIPMENT NO.
SEND RESULTS TO:

COMMENTS: 21 DAY TAT 59-1785 1

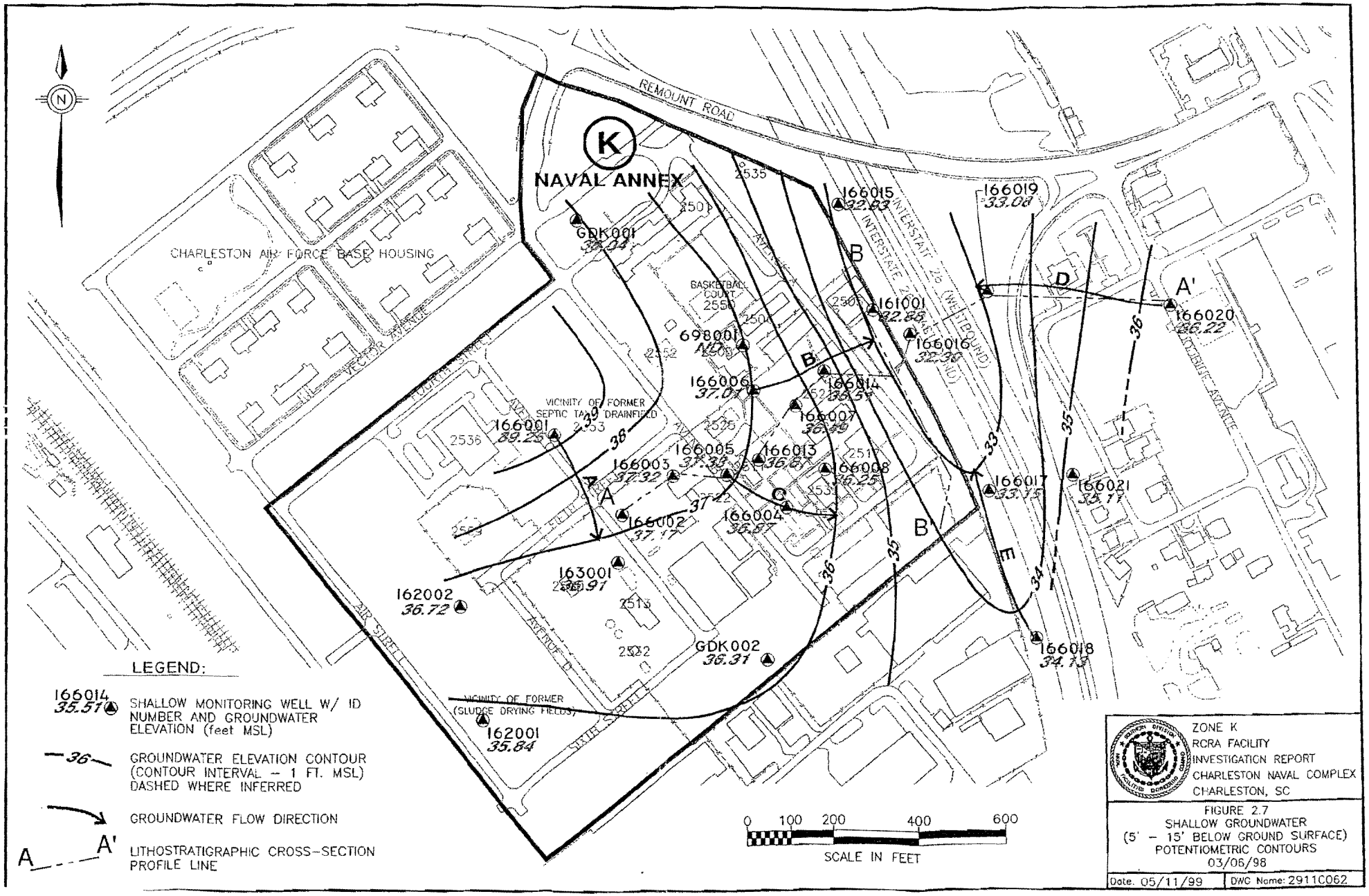
ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSLOG 2
REV. 05/90

APPENDIX C

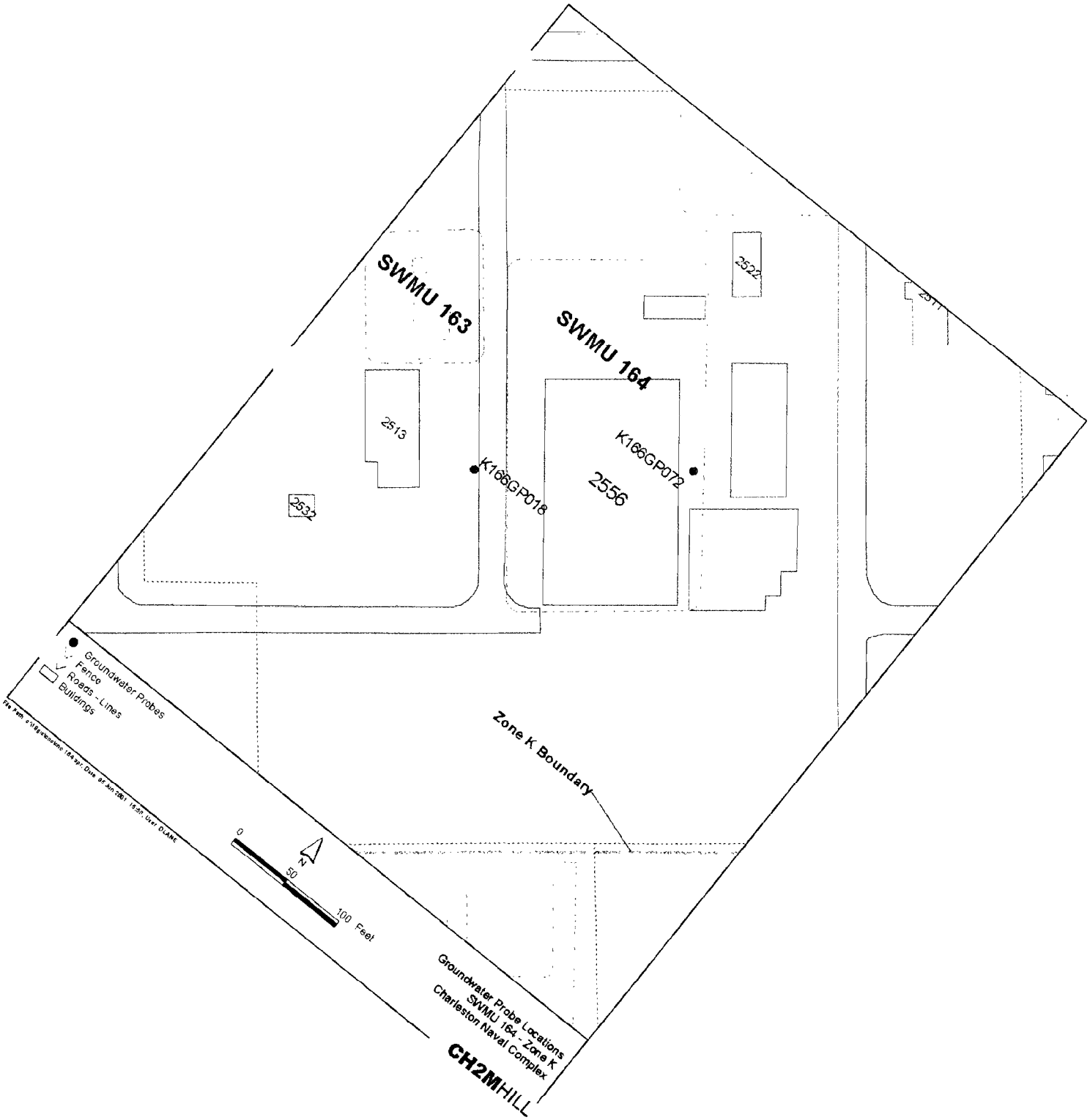
RFI Figure 2.7,

Shallow Groundwater Potentiometric Contours


K
NAVAL ANNEX
REMOUNT ROAD
CHARLESTON AIR FORCE BASE HOUSING
VECTOR AVENUE
FOURTH STREET
AIR STREET
AVENUE D
BASKETBALL COURT
VICINITY OF FORMER SEPTIC TANK DRAINFIELD
VICINITY OF FORMER (SLUDGE DRYING FIELDS)
INTERSTATE 26 (WESTBOUND)
INTERSTATE 26 (EASTBOUND)
GDK001
38.34
166015
32.83
166019
33.08
161001
32.88
166016
32.30
166020
36.22
698001
ND
166006
37.07
166014
35.54
166007
36.39
166001
39.26
166005
37.38
166013
36.61
166008
36.25
166003
37.32
166002
37.17
166004
36.87
166017
33.15
166021
33.17
163001
36.91
162002
36.72
GDK002
36.31
166018
34.13
162001
35.84
A
A'
B
C
D
E
39
38
37
36
35
34
33
LEGEND:
166014 35.51 SHALLOW MONITORING WELL W/ ID NUMBER AND GROUNDWATER ELEVATION (feet MSL)
36 GROUNDWATER ELEVATION CONTOUR (CONTOUR INTERVAL – 1 FT. MSL) DASHED WHERE INFERRED
GROUNDWATER FLOW DIRECTION
A A' LITHOSTRATIGRAPHIC CROSS-SECTION PROFILE LINE
0 100 200 400 600
SCALE IN FEET
ZONE K
RCRA FACILITY
INVESTIGATION REPORT
CHARLESTON NAVAL COMPLEX
CHARLESTON, SC
FIGURE 2.7
SHALLOW GROUNDWATER
(5' – 15' BELOW GROUND SURFACE)
POTENTIOMETRIC CONTOURS
03/06/98
Date. 05/11/99
DWG Name: 2911C062

APPENDIX D

SWMU 164 Groundwater Probe Locations


SWMU 163
SWMU 164
2513
2532
2522
2511
2556
K166GP018
K166GP072
Zone K Boundary
Groundwater Probes
Fence
Roads - Lines
Buildings
0
50
100 Feet
N
Groundwater Probe Locations
SWMU 164 - Zone K
Charleston Naval Complex
CH2MHILL

APPENDIX E

Responses to SCDHEC Comments

Comments and Responses on the Zone K RFI Report Revision No. 0 June 11, 1999

Comment 11. Page 10.4.26, SWMU 164 (Susan Byrd)

The soil to air cross media transport states that no VOCs were detected in surface soils and therefore, the air migration pathway is considered insignificant. Table 10.4.1 indicates that only the duplicate sample was analyzed for VOCs. The significance of the soil to air migration is not known since VOC analysis was not performed on the soil samples. Please revise the text accordingly.

CH2M-Jones Response:

Ensafe collected soil samples as part of their RFI Addendum field activities in November 1999-January 2000. Seventeen soil samples were collected at the site and analyzed for VOCs in 1999. The results are reported in this RFI Addendum (Section 3.0). No VOCs were detected in surface or subsurface soil.

Comment 22. Section 10.4, SWMU 164 (Paul Bergstrand)

The paint shop portion of this SWMU has not been addressed. Samples for paint constituents and volatiles are necessary to complete the RFI Report. Seven of nine surface soil samples were positive for Diesel Range Organics (DRO). Second round soil samples did not analyze for DRO. Additional samples for DRO constituents are necessary to complete the RFI Report.

The inorganic samples were apparently collected from along the road and not in the ditch where blasting materials would accumulate. Additional samples for inorganics are necessary to complete the RFI Report.

The AST, which reported to have numerous stains, was not investigated. If an investigation was conducted by the Storage Tank Program, please reference the report in the text and submit a copy of the report to this office. If an investigation was not completed additional samples for petroleum constituents is necessary to complete the RFI Report.

None of the surficial or subsurface soil samples were analyzed for VOCs. Additional samples for paint constituents and volatiles are necessary to complete the RFI Report.

There were no monitoring wells installed at this SWMU. Additional monitoring wells sampled for the parameters discussed above may be necessary to complete the RFI Report.

CH2M-Jones Response: According to page 2-17 of the approved Zone K RFI Work Plan Addendum (CH2M HILL-Jones, 2000), the task team agreed in the September 6, 2000 scoping meeting that additional soil and groundwater sample locations were not required to investigate potential soil and groundwater contaminants associated with SWMU 164, including additional investigation in the stormwater ditch area along Avenue C or the former aboveground storage tank area. Further rationales for no further investigation or action specific to the above comment are offered below.

The RFA identified only the blasting operation as having a potential for release of contamination. The painting area was evaluated and found to have low potential for impact to soil or groundwater due to the enclosed booth, intact floor, and roof ventilation, and since waste paint was stored in the satellite accumulation area (SAA). VOCs (see response to comment 11 above) and SVOCs, were analyzed from the samples collected around the SAA and fuel tank areas. Though some PAHs including BEQs were detected in soil, no results exceeded screening criteria.

The area of the former AST was tested for VOC's and SVOC's as discussed in the above paragraph. The tank was removed and closure approved by the SCDHEC as presented in this RFI addendum (Section 4.0).

A number of additional soil samples were collected in drainage areas around Building 2556. The results are presented in this RFI addendum (Section 3). Only aluminum, arsenic, thallium, and BEQs were detected above screening levels as discussed in Sections 3 and 4 of this RFI addendum.

The soil data collected indicate the soil-to-groundwater pathway is absent at SWMU 164. Results of VOCs, SVOCs, pesticide/PCBs, gasoline/diesel, and metals tests are available from nearby grid wells and groundwater points as discussed in response to comment 13 on the work plan addendum (next page). No chemicals except aluminum, arsenic, thallium, and BEQs were detected above screening levels as discussed in Sections 3 and 4 of this RFI addendum.

Comments and Responses on the Final Zone K RFI Work Plan Addendum Revision No. 0 November 16, 1999

Comment 12: Figure 2.4

This figure does not indicate the groundwater flow direction. Please revise the figure for the report.

CH2M-Jones Response: A potentiometric map showing groundwater elevation contours and groundwater flow direction is provided in this RFI addendum (Appendix C). The interpreted groundwater flow direction at SWMU 164 is from northwest to southeast.

Comment 13: Page 2.4.4, Section 2.4.2 Data Gaps, Groundwater, lines 22-23.
The text states that the decision to install monitoring wells will be made on the results of the pending soil investigation. Please explain the rational to justify this line of thought. Monitoring wells will be needed before soil analytical results are received to characterize the groundwater at this site. The Navy must also determine site-specific groundwater flow directions to properly characterize the site.

CH2M-Jones Response: According to page 2-17 of the approved Zone K RFI Work Plan Addendum (CH2M HILL-Jones, 2000), the task team agreed in the September 6, 2000 scoping meeting that additional soil and groundwater sample locations were not required to investigate potential soil and groundwater contaminants associated with SWMU 164, including additional investigation in the stormwater ditch area along Avenue C or the former aboveground storage tank area. Further rationale for no further investigation or action specific to the above comment are offered below.

There were no contaminants detected above screening levels in six rounds of groundwater samples collected from grid well GDKGW002, which is located approximately 130 feet downgradient of SWMU 164. Five rounds were sampled for metals, four for pesticides/PCBs and SVOCs, three for VOCs, and one for gasoline/diesel. In addition, there were no VOCs detected in the groundwater samples collected from the shallow portion of the surficial aquifer at the direct push technology (DPT) points 166GP018 and 166GP072, which are located approximately 50 feet sidegradient of building 2556 and 110 feet downgradient of the SAA, respectively. Metals were not detected above their respective MCLs in the filtered sample from 166GP018. Chlorinated solvents were not detected above the method detection limit in the groundwater sample collected from the deep monitoring well, 166GW22D, located on the SWMU 164 site 25 feet west of building 2556. Finally, see response to comment 12 above concerning the flow direction of groundwater.