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CONFIRMATORY SAMPLING INVESTIGATION REPORT AREA OF CONCERN 713 (AOC 713) ZONE F AND AREA OF CONCERN 716 (AOC 716) ZONE E FOR OIL/WATER SEPARATORS CNC CHARLESTON SC

10/8/2002

CH2M HILL

CONFIRMATORY SAMPLING INVESTIGATION REPORT

AOC 713 (Zone F) and AOC 716 (Zone E) Oil/Water Separators

Charleston Naval Complex
North Charleston, South Carolina

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

CH2M HILL

October 2002

Contract N62467-99-C-0960

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October 8, 2002

Mr. David Scaturo
South Carolina Department of Health and
Environmental Control
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

Re: Confirmatory Sampling Investigation Report for AOC 713 (Zone F) and AOC 716 (Zone E)

Dear Mr. Scaturo:

Enclosed please find four copies of the Confirmatory Sampling Investigation Report for AOC 713 (Zone F) and AOC 716 (Zone E) of the Charleston Naval Complex (CNC). This report has been prepared pursuant to agreements by the CNC BRAC Cleanup Team for completing the RCRA Corrective Action process.

The principal author of this document is Louise Palmer. Please contact her at (704) 329-0072, extension 296, if you have any questions or comments.

Sincerely,

CH2M HILL

Dean Williamson, P.E.

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

CONFIRMATORY SAMPLING INVESTIGATION REPORT

AOC 713 (Zone F) and AOC 716 (Zone E)
Oil/Water Separators

Charleston Naval Complex
North Charleston, South Carolina

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

PREPARED BY
CH2M-Jones

October 2002

Revision No.0
Contract N62467-99-C-0960
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Acronyms and Abbreviations

AOC	Area of concern
BEQ	Benzo[a]pyrene equivalent
BRAC	Base Realignment and Closure Act
BRC	Background reference concentration
CA	Corrective action
CNC	Charleston Naval Complex
COPC	Chemical of potential concern
COC	Chemical of concern
CSI	Confirmatory sampling investigation
DAF	Dilution attenuation factor
DPT	Direct-push technology
EPA	U.S. Environmental Protection Agency
EnSafe	EnSafe Inc.
ft bls	Feet below land surface
HI	Hazard index
µg/L	Microgram per liter
mg/kg	Milligram per kilogram
MCL	Maximum contaminant level
NAVBASE	Naval base
NFA	No further action
NFI	No further investigation
OP	Organophosphorous
OWS	Oil/water separator
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl

Acronyms and Abbreviations, Continued

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
SSL	Soil screening level
SWMU	Solid waste management unit
SVOC	Semivolatile organic compound
UST	Underground storage tank
VOC	Volatile organic compound

Section 1.0

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 report the Confirmatory Sampling Investigation (CSI) for Oil/Water Separator (OWS) Areas of Concern (AOC) 713 in Zone F, and 716 in Zone E of the CNC. These AOCs were not included in the RFI reports submitted for Zone E and Zone F because they had not been identified as AOCs while the RFI was in progress. CSIs for these units were recommended in the *RCRA Facility Assessment (RFA), Revision 1, Charleston Naval Complex* (Department of the Navy, Southern Division, February 2001). Figure 1-1 illustrates the locations of AOCs 713 and 716 within Zones E and F at CNC.

1.1 Background

OWS AOC 713 was added to the RCRA Part B permit in 2001. This site was designated for CSI sampling to determine the nature and extent of potential contamination caused by any potential hazardous waste releases from historical OWS use, prior to site closure.

OWS AOC 716 was also added to the RCRA Part B permit in 2001. The OWS described in this CSI report has been investigated as part of Solid Waste Management Unit (SWMU) 37 (Sanitary Sewer System), within the CNC. The environmental samples identified near the OWS were evaluated using the CNC RFI screening process to determine either the presence or absence of contamination.

The two OWS AOCs discussed in this CSI report are proposed for No Further Action (NFA) status, based on the absence of contamination indicated by the analytical results from the previous RFI sampling and the recent CSI sampling.

1.2 Zones E and F Physical Setting

The physical setting of Zone E is discussed in detail in Section 2 – NAVBASE Physical Setting of the *Zone E RFI Report, Revision 0* (EnSafe, 1997a). The physical setting of Zone F is likewise discussed in detail in Section 2 –Physical Setting of the *Zone F RFI Report, Revision 0* (EnSafe, 1997b). The RFI reports include discussions of the regional setting, geologic and hydrogeologic conditions, and climate of the CNC. The areas around AOCs 713 and 716 are zoned for future heavy marine-industrial usage (M-2), similar to the current and historical usage.

1.3 Potential Receptors

The potential receptors for Zone E and Zone F sites are discussed in detail in Section 6 – Fate and Transport, Section 7 – Human Health Risk Assessment, and Section 8 – Ecological Risk Summary of the *Zone E RFI Report, Revision 0* and the *Zone F RFI Report, Revision 0*. Because the investigated units are below grade, potential releases from the OWS AOCs would have impacted subsurface soil and groundwater.

1.4 Report Organization

This CSI Report consists of the following sections, including this introductory section:

1.0 Introduction — Presents the purpose of the report and general information regarding the facility setting and potential receptors at the AOC sites.

2.0 AOC 713 CSI – Oil/Water Separator at Building 241— Presents a description of the AOC and summarizes the results for samples collected in the vicinity of AOC 713.

3.0 AOC 716 CSI – Oil/Water Separator at Building 1024— Presents a description of the AOC and summarizes the results for samples collected in the vicinity of AOC 716.

4.0 CSI Conclusions and Recommendations—Provides conclusions and recommendations regarding potential contamination at the sites.

5.0 References — Lists the references used in this document.

Appendix A contains photographs of the AOC 713 and 716 areas.

Appendix B contains construction record drawings for the OWS at Building 241.

Appendix C contains data summary tables for AOC 713 CSI samples.

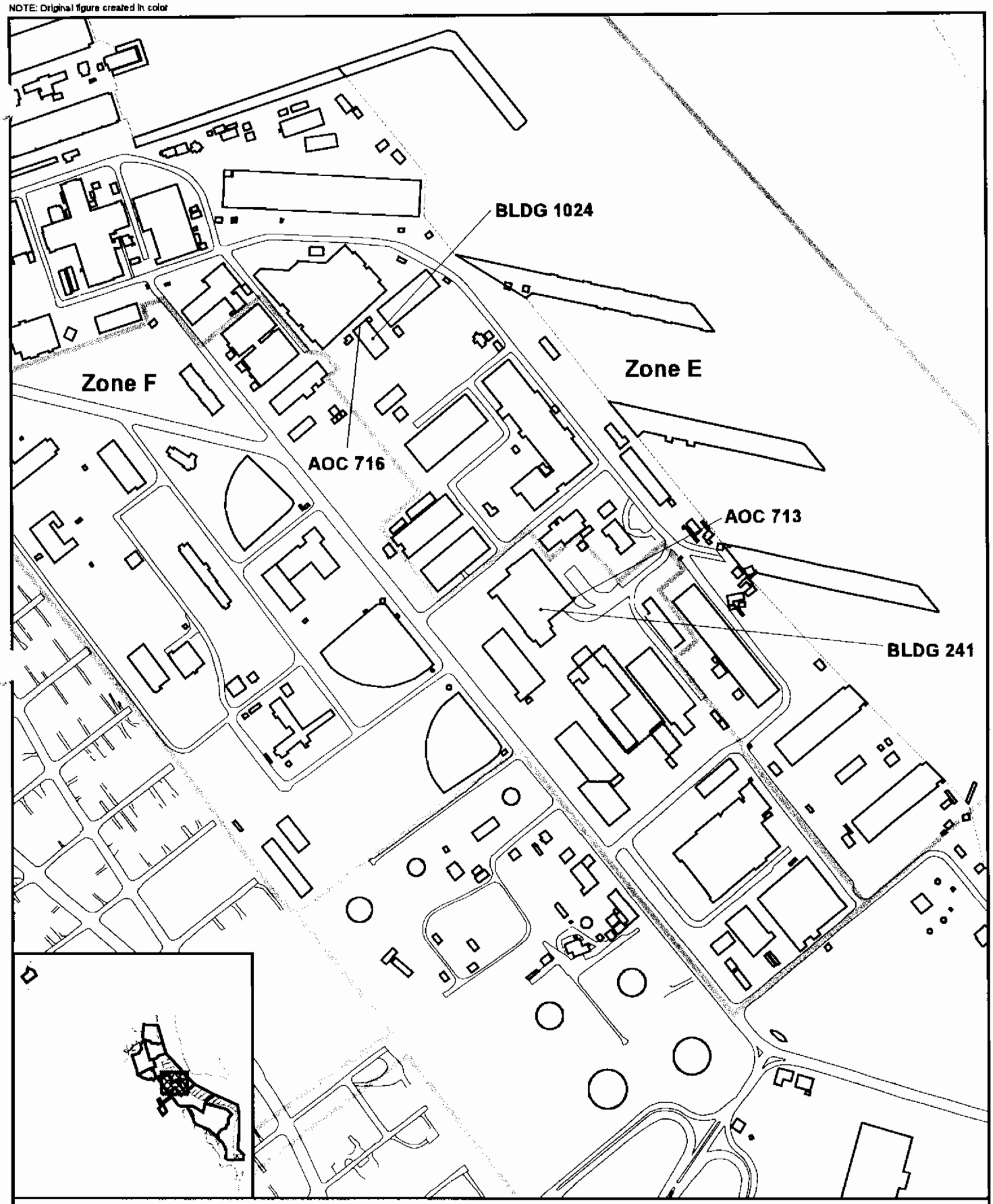
Appendix D contains data validation summaries for AOC 713 and 716 samples.

Appendix E contains the DPT groundwater sample logs for AOC 713.

Appendix F contains the data summary tables for AOC 716 samples.

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

NOTE: Original figure created in color



AOC Boundary
SWMU Boundary
Roads
Shoreline
Buildings
Zone Boundary

N

0 500 1000 Feet

1 inch = 500 feet

Figure 1-1
Location of AOCs 713 and 716
Zones E and F
Confirmatory Sampling Investigation
Charleston Naval Complex

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Section 2.0

2.0 AOC 713 CSI – Oil/Water Separator at Building 241

2.1 Description of AOC 713

AOC 713 is defined in the 2001 RFA as an OWS located near the southeast corner of Building 241. Figure 2-1 presents an aerial photograph of AOC 713. Photographs of AOC 713 are presented in Appendix A. According to record drawings, the OWS is a 4-foot (ft) diameter precast concrete manhole with piping 4 feet below land surface (ft bls). The base is 8 ft bls. The top of the OWS is a steel cover at surface grade, sealed against surface water intrusion. The OWS drains to the sanitary sewer system. Construction record drawings of the OWS are presented in Appendix B.

Building 241 is currently unoccupied, but was used by the Navy as the Crane Maintenance Facility from its construction in 1987 until closure of the base in 1993. The OWS appears to be available for use as needed and has not been taken out of service. According to the *RCRA Facility Assessment* (2001), the OWS at AOC 713 serviced a 16 x 60-ft concrete wash pad at the southeast corner of the building, along with floor drains from within Building 241. The pattern of pavement patches at the OWS indicates that approximately 230 linear feet of drains surrounding the end of the crane rails east of Building 241 also transferred surface water to the OWS.

The area surrounding AOC 713 is paved with asphaltic concrete. The equipment wash pad and the OWS are slightly elevated above the surrounding pavement, and do not collect surface runoff from the surrounding area. Surface drainage in the vicinity of AOC 713 is collected by the storm drain catch basins south of the OWS. Groundwater flow is to the west, based on extrapolated groundwater potentiometric contours prepared for the area south and east of Building 241. Figure 2-2 presents these groundwater potentiometric contours for the area, which are based on water levels measured in December 2001. The groundwater potentiometric surface at AOC 713 is estimated at 6 ft bls, extrapolated from groundwater monitoring wells within AOC 613, south of AOC 713.

2.2 Environmental Sampling at AOC 713

Groundwater from the direct-push technology (DPT) probe LF699GP050 was collected adjacent to the OWS for the Zone L, AOC 699 (Storm Sewer System) RFI, and analyzed for volatile organic compounds (VOCs), cyanide, and metals (see *Zone L RFI Report, Revision 0*, [EnSafe, 1998]). Figure 2-3 presents the Zone L RFI sample collected in the vicinity of AOC 713. The complete data set for the Zone L sample is located in the *Zone L RFI Report, Revision 0*.

For the AOC 713 CSI, three additional subsurface soil samples and three additional groundwater samples were collected from the area surrounding the OWS, and samples of sludge and water were collected from inside the OWS. These samples were collected as described in the *Sampling and Analysis Plan; AOC 713, Zone F; AOC 720, Zone F; Oil/Water Separators; Charleston Naval Complex*; (CH2M-Jones, 2002). These CSI sample locations are also presented in Figure 2-3. Samples of the water and sediment within the OWS were also collected in 2002 for the CSI.

The data set for the AOC 713 samples is presented in Appendix C of this report. Data validation summaries for the 2002 data are presented in Appendix D. The AOC 713 and Zone L sample results are described below, as well as the 2002 sample results collected from OWS water and sediment.

2.2.1 Soil Samples

Three subsurface soil samples were collected from 3 to 5 ft bls, corresponding to the OWS inlet and outlet pipe depth. Samples from F713SB001, F713SB002, and F713SB003 were analyzed for polychlorinated biphenyls (PCBs)/pesticides, VOCs, semivolatile organic compounds (SVOCs), and metals. As discussed in the data validation summary report (see Appendix D), a laboratory oversight required the recollection and reanalysis of the soil samples for VOCs. The original data were provided by the laboratory, however, they were qualified with an "S, " to be used for screening purposes only. The three original locations were resampled for VOCs and labeled F713SB004, F713SB005, and F713SB006, which represent the respective locations of F713SB001, F713SB002, and F713SB003. The resampling data met all applicable quality control (QC) requirements.

The analytes detected in the soil samples are listed in Table 2-1. Subsurface soil concentrations were compared to leachability-to-groundwater based screening criteria, soil screening levels (SSLs) from the U.S. Environmental Protection Agency (EPA) *Soil Screening Guidance Appendix A* (1996). SSLs were based on a dilution attenuation factors (DAFs) of 1.0

for VOCs and 10 for other analytes. Metals concentrations in soils were also compared to background concentrations for subsurface soil from combined Zone E and F grid (background) samples. The background sample data sets for the two zones were combined because of the following reasons: 1) the small grid sample population for Zone F, 2) because AOC 713 is located close to Zone E, and 3) because the area has been used for similar industrial land uses as Zone E. The results of the soils data screening analyses were used to identify if any of the chemicals detected are considered chemicals of potential concern (COPCs). A discussion of the data is presented below.

Metals in Soil Samples

The metals in the subsurface soil samples were detected at concentrations similar to the background ranges for Zones E and F. As presented in Table 2-1, no metals concentrations exceeded both SSLs (DAF=10) and background concentrations. No metal COPCs were identified in the soil samples.

PCBs/Pesticides in Soil Samples

No PCBs were detected in the soil samples. As shown in Table 2-1, trace levels of pesticides were detected in the subsurface soil from F713SB002 and F713SB003. The beta-hexachlorocyclohexane (beta-BHC) concentration at F713SB002, estimated at 0.0037 mg/kg, was greater than the SSL of 0.0015 mg/kg. Therefore, beta-BHC may be considered a COPC at AOC 713, and is discussed further in Section 2.3.

SVOCs in Soil Samples

Trace amounts of diethyl phthalate and di-n-butyl phthalate, commonly associated with field or laboratory contamination, were detected in the subsurface soil samples. In addition, 1,4-dichlorobenzene and the polycyclic aromatic hydrocarbons (PAHs) fluoranthene and pyrene were detected in soil at AOC 713. All detected SVOC concentrations were less than SSLs, and are not selected as COPCs for soils at AOC 713.

VOCs in Soil Samples

As shown in Table 2-1, trace amounts of cis-1,2-dichloroethene, ethylbenzene, toluene, and xylenes were detected in soils in the AOC 713 area, in addition to trace amounts of the common laboratory contaminants acetone and methyl ethyl ketone. No VOC concentrations exceeded SSLs, therefore no VOC COPCs were identified. Therefore, VOCs in soil are not a concern at AOC 713.

2.2.2 Groundwater Samples

Data from the four DPT samples collected within the AOC 713 area were used to evaluate groundwater quality at AOC 713. The sample from location LF699GP050, collected for the Zone L, AOC 699 RFI, was analyzed for metals, cyanide, and VOCs. The metals data from unscreened DPT groundwater samples are not considered representative of area groundwater due to the potential for the presence of particulates in the DPT sample, and are not evaluated in this report. DPT samples F713GP001, F713GP002, and F713GP003 were screened from the first water-producing stratum encountered at the site, from 19 to 23 ft bls, and analyzed for VOCs, SVOCs, and PCBs/pesticides. The results of the groundwater analyses are presented in Table 2-2, and are discussed below. Logs of the DPT groundwater samples collected for the AOC 713 investigation in 2002 are presented in Appendix E.

PCBs/Pesticides in Groundwater Samples

No PCBs or pesticides were detected in the groundwater samples.

SVOCs in Groundwater Samples

As presented in Table 2-2, the only SVOC detected in the groundwater was naphthalene at sample location F713GP001. The estimated concentration of 0.74 micrograms per liter (μg/L) is greater than the RBC of 0.65 μg/L, which is adjusted for a hazard index (HI) of 0.1. This compound is selected as a COPC in groundwater and is evaluated further in Section 2.3.

VOCs in Groundwater Samples

No VOCs were detected in the groundwater samples.

2.2.3 OWS Contents Samples

In 2002, a sample of sludge and water were collected from the OWS and analyzed for VOCs, SVOCs, PCBs/pesticides, and metals. As discussed in the data validation summary report (see Appendix D), a laboratory oversight required the recollection and reanalysis of the sludge sample for VOC analysis. The original data were provided by the laboratory, however, they were qualified with an "S, " to be used for screening purposed only, due to the problems identified by the laboratory. The resampling data met all applicable QC requirements.

Tables 2-3 and 2-4 present the analytes detected in the OWS. Because these media are not in contact with human or environmental receptors, they are not a true exposure concern. However, the analytes detected in the OWS sludge were compared with SSL and background levels for soil, and the OWS water was compared to groundwater comparison

criteria to determine if these media need management actions. The results of this conservative evaluation are discussed briefly below.

Metals in OWS Contents

Metals were detected in both sludge and water samples at concentrations generally comparable to background values for both surface soil and shallow groundwater. Antimony and cadmium were at higher concentrations in the sludge, compared to background subsurface soil concentrations. Antimony was also detected at elevated concentrations in the OWS water sample. However, the concentrations of these two metals in subsurface soil outside of the OWS were within their background ranges (see Table 2-1).

VOCs in OWS Contents

As presented in Table 2-3, ethylbenzene, toluene, and xylenes were detected in the OWS sludge. The VOCs were not detected in the OWS water sample or in the groundwater outside of the OWS.

SVOCs in OWS Contents

As presented in Table 2-3, PAHs and bis(2-ethylhexyl)phthalate were identified in the OWS sludge, however none were above SSLs. SVOCs were not detected in the OWS water sample or in the groundwater outside of the OWS.

Pesticides and PCBs in OWS Contents

As presented in Table 2-3, no PCBs were detected, and trace amounts of pesticides were detected in the sludge sample, below COPC screening criteria. No pesticides or PCBs were detected in the OWS water sample.

2.3 COPC Evaluation and Refinement

This section discusses the chemicals that were identified as COPCs because their concentrations exceeded background values and a screening criteria value. The factors that determine whether a COPC meets the criteria for being a chemical of concern (COC) are discussed for each parameter.

2.3.1 Subsurface Soil COPC Refinement

Several pesticides were detected in one subsurface soil sample (at F713SB002), located adjacent to the OWS. Beta-BHC was identified as a COPC in subsurface soil because it was detected at an estimated concentration of 0.0037 mg/kg, close to the detection limit but slightly above the SSL (DAF=10) of 0.0015 mg/kg. The data for this chemical in all of the

subsurface soil samples are provided in Table 2-5. As noted in the table, this compound was not detected in any other sample collected at AOC 713. It has not been detected in any groundwater sample in the general vicinity of AOC 713, indicating that it is not migrating from the soil. The site average using half the detection limits is estimated to be 0.002 mg/kg, which is below detection limit and near the SSL (based on DAF=10) of 0.0015 mg/kg. Based on the limited detection of this chemical and lack of detection in any groundwater sample, beta-BHC is not considered a COC at AOC 713.

2.3.2 Groundwater COPC Refinement

Naphthalene was detected in groundwater at AOC 713. The data for this chemical are provided in Table 2-6. As noted in the table, naphthalene was detected at an estimated concentration of 0.74 μg/L in one of the three samples surrounding the OWS. It was chosen as a COPC because it exceeded the RBC of 0.65 μg/L, adjusted for a HI of 0.1. The RBC adjustments are made to take into account the potentially cumulative effects of multiple COPCs at a site. Since naphthalene was the only COPC identified in groundwater, it is compared to an HI=1.0-based value of 6.5 μg/L, which was not exceeded. In addition, the health advisory level for lifetime exposure included in the Drinking water Standards and Health Advisories (EPA, 2002) of 100 μg/L was not exceeded. Therefore, naphthalene is not selected as a COC for groundwater at AOC 713. There are no COCs for groundwater at this site.

2.4 Investigation Summary – AOC 713

The metals detected in soil samples at AOC 713 appear to be from background concentrations, and are not particularly elevated at the site. No impacts from OWS system operation at Building 241 are observed. Although traces of organic compounds and pesticides were detected in the soil samples collected in the vicinity of AOC 713, the concentrations were reflective of the general industrial setting. The detected concentrations in environmental media are generally well below screening criteria, and the observed low levels do not indicate potential current or future human health or ecological impacts at the site. Only naphthalene was detected in the groundwater at AOC 713 and is not identified as a COC. In summary, there are no COCs in soil or groundwater at the site. Though the OWS contents had metals at concentrations slightly elevated above background levels and SSL or maximum contaminant level (MCL) criteria, the observed elevations were limited and were not identified with COCs in the media surrounding the OWS.

2.5 AOC 713 CSI Conclusions and Recommendations

The following conclusions and recommendations are made for the soil and groundwater at the AOC 713 OWS system:

- The OWS was constructed in the 1980s, and although it is not currently in use it is operable. It consists of a precast concrete manhole section with inlet and outlet piping 4 ft bls. The OWS drains to the sanitary sewer system.
- Soil and groundwater samples were collected adjacent to the OWS system specifically to investigate any potential releases from the OWS system, as provided in the approved Zone L RFI Work Plan and the *Sampling and Analysis Plan; AOC 713, Zone F; AOC 720, Zone F; Oil/Water Separators; Charleston Naval Complex* (CH2M-Jones, 2002)
- The soil and groundwater samples that were analyzed for the full range of VOCs, SVOCs, PCBs, pesticides, and metals indicate no COPCs at AOC 713, and no releases of significance from the OWS system. The contents of the OWS were also analyzed for the same suite of analytes, and no COCs were identified that required further action.

It is concluded that sufficient data exist to evaluate AOC 713. These data indicate no significant releases at the site, and an NFA status is recommended.

TABLE 2-1
Analytes Detected in Subsurface Soil at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]
Metals						
Aluminum	F713SB001	06/07/2002	36,600	=	NL	1,220 - 29,900
	F713SB002	06/07/2002	11,100	=		
	F713SB003	06/07/2002	47,600	=		
Arsenic	F713SB001	06/07/2002	15.3	=	15	0.83 - 30
	F713SB002	06/07/2002	5.9	=		
	F713SB003	06/07/2002	22	=		
Barium	F713SB001	06/07/2002	45.2	J	800	6.1 - 91
	F713SB002	06/07/2002	18.7	J		
	F713SB003	06/07/2002	56.1	J		
Beryllium	F713SB001	06/07/2002	1.34	J	32	0.15 - 1.6
	F713SB002	06/07/2002	0.34	J		
	F713SB003	06/07/2002	1.71	J		
Cadmium	F713SB001	06/07/2002	0.213	J	4	0.08 - 0.96
	F713SB003	06/07/2002	0.241	J		
Calcium	F713SB001	06/07/2002	5,210	=	NL	323 - 22,900
	F713SB002	06/07/2002	10,500	=		
	F713SB003	06/07/2002	7,960	=		
Chromium, Total	F713SB001	06/07/2002	45.9	J	19	1.6 - 75.2
	F713SB002	06/07/2002	14.5	J		
	F713SB003	06/07/2002	59.6	J		
Cobalt	F713SB001	06/07/2002	8.01	J	1,000	0.41 - 14.9
	F713SB002	06/07/2002	2.13	J		
	F713SB003	06/07/2002	8.07	J		
Copper	F713SB001	06/07/2002	27.1	=	5,300	1.3 - 192
	F713SB002	06/07/2002	6.97	=		
	F713SB003	06/07/2002	35.6	=		

TABLE 2-1
Analytes Detected in Subsurface Soil at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]
Iron	F713SB001	06/07/2002	34,200	=	NL	924 – 35,800
	F713SB002	06/07/2002	7,750	=		
	F713SB003	06/07/2002	42,800	=		
Lead	F713SB001	06/07/2002	43.2	=	400	1.8 - 322
	F713SB002	06/07/2002	12.4	=		
	F713SB003	06/07/2002	53.6	=		
Magnesium	F713SB001	06/07/2002	4,150	=	NL	76.5 - 9,140
	F713SB002	06/07/2002	871	J		
	F713SB003	06/07/2002	5,050	=		
Manganese	F713SB001	06/07/2002	512	=	480	4.9 - 1,120
	F713SB002	06/07/2002	70.2	=		
	F713SB003	06/07/2002	524	=		
Mercury	F713SB001	06/07/2002	0.186	J	1	0.04 - 0.9
	F713SB002	06/07/2002	0.06	J		
	F713SB003	06/07/2002	0.159	J		
Nickel	F713SB001	06/07/2002	15.3	J	65	0.85 - 19.7
	F713SB002	06/07/2002	4.87	J		
	F713SB003	06/07/2002	19.4	J		
Potassium	F713SB001	06/07/2002	1,930	J	NL	106 - 3,440
	F713SB002	06/07/2002	425	J		
	F713SB003	06/07/2002	2,380	J		
Selenium	F713SB001	06/07/2002	1.26	J	2.5	0.4 - 2.4
	F713SB003	06/07/2002	1.67	J		
Sodium	F713SB001	06/07/2002	981	J	NL	20.8 - 1,430
	F713SB002	06/07/2002	118	J		
	F713SB003	06/07/2002	1,030	J		
Vanadium	F713SB001	06/07/2002	77.6	=	3,000	1.6 - 71.9

TABLE 2-1
Analytes Detected in Subsurface Soil at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]
Vanadium	F713SB002	06/07/2002	18.4	=	3,000	1.6 - 71.9
	F713SB003	06/07/2002	96.5	=		
Zinc	F713SB001	06/07/2002	113	=	6,000	5.8 - 438
	F713SB002	06/07/2002	29.5	=		
	F713SB003	06/07/2002	129	=		
Semivolatile Organic Compounds						
1,4-Dichlorobenzene	F713SB002	06/07/2002	0.0403	J	1	NA
Diethyl Phthalate	F713SB001	06/07/2002	0.0804	J	235	NA
	F713SB002	06/07/2002	0.0617	J		
Di-n-butyl Phthalate	F713SB003	06/07/2002	0.0923	J	1,200	NA
Fluoranthene	F713SB002	06/07/2002	0.03	J	2,100	NA
Pyrene	F713SB002	06/07/2002	0.035	J	2,100	NA
Volatile Organic Compounds						
Acetone	F713SB001	6/7/2002	0.169	SJ	0.8	NA
	F713SB003	6/7/2002	0.274	SJ		
Methyl ethyl ketone (2-Butanone)	F713SB001	6/7/2002	0.0278	SJ	0.4	NA
	F713SB003	6/7/2002	0.0416	SJ		
cis-1,2-Dichloroethene	F713SB001	6/7/2002	0.0012	SJ	0.4	NA
1,2-Dichloroethene (total)	F713SB001	6/7/2002	0.0012	SJ	0.4	NA
Ethylbenzene	F713SB004	07/11/2002	0.0015	J	0.65	NA
	F713SB005	07/11/2002	0.0014	J		
	F713SB006	07/11/2002	0.0052	J		
Toluene	F713SB001	6/7/2002	0.00062	SJ	0.6	NA
	F713SB002	6/7/2002	0.00060	SJ		
	F713SB004	07/11/2002	0.00044	J		
	F713SB005	07/11/2002	0.0004	J		

TABLE 2-1
Analytes Detected in Subsurface Soil at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]
Toluene	F713SB006	07/11/2002	0.0013	J	0.6	NA
Xylenes, Total	F713SB004	07/11/2002	0.0054	J	9	NA
	F713SB005	07/11/2002	0.005	J		
	F713SB006	07/11/2002	0.0182	=		
Pesticides						
alpha-Chlordane	F713SB002	06/07/2002	0.0187	J	5	NA
beta-BHC (beta-Hexachlorocyclohexane)	F713SB002	06/07/2002	**0.0037**	J	0.0015	NA
Chlordane	F713SB002	06/07/2002	0.194	=	5	NA
delta-BHC (delta-Hexachlorocyclohexane)	F713SB002	06/07/2002	0.0024	J	0.0045	NA
Dieldrin	F713SB002	06/07/2002	0.0016	J	0.002	NA
Endosulfan Sulfate	F713SB002	06/07/2002	0.0056	J	9	NA
	F713SB003	06/07/2002	0.00041	J		NA
Endrin Aldehyde	F713SB002	06/07/2002	0.0055	J	0.5	NA
Endrin Ketone	F713SB002	06/07/2002	0.0037	J	0.5	NA
gamma-Chlordane	F713SB002	06/07/2002	0.0412	=	5	NA
Heptachlor	F713SB002	06/07/2002	0.0048	J	12	NA
Heptachlor Epoxide	F713SB002	06/07/2002	0.0038	J	0.35	NA
Methoxychlor	F713SB002	06/07/2002	0.0102	J	80	NA
p,p'-DDD	F713SB002	06/07/2002	0.0021	J	8	NA
p,p'-DDE	F713SB002	06/07/2002	0.0012	J	27	NA
p,p'-DDT	F713SB002	06/07/2002	0.0131	J	16	NA

All values are presented in units of milligrams per kilogram (mg/kg).

Concentrations shown outlined and in bold print indicate exceedance of screening criteria.

[a] SSLs are from the *EPA Soil Screening Guidance: User's Guide*; DAF=1.0 for VOCs, DAF=10 for others.

[b] Background Range values for metals are the minimum and maximum concentrations detected in Zones E and F combined grid samples.

TABLE 2-1
Analytes Detected in Subsurface Soil at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

SJ Estimated concentration, used for screening only.

TABLE 2-2
Analytes Detected in Groundwater at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/*RBC*[a]	Zone F BRC	Zone E BRC
Semivolatile Organic Compounds							
Naphthalene	F713GP001	06/11/2002	**0.74**	J	*0.65*	NA	NA

Concentrations in bold type and outlined exceed the MCL/*RBC* and the Zone Background Reference Concentration (BRC).

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

[a] RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (HI=0.1)

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available/not applicable

TABLE 2-3
Analytes Detected in OWS Sediment at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Surface Soil Background Range[b]	Subsurface Soil Background Range[b]
Metals							
Aluminum	F713VAOS1	06/07/2002	2,400	=	NL	261 - 20,500	1,220 - 29,900
Antimony	F713VAOS1	06/07/2002	**21.5**	J	2.5	0.5 - 7.4	0.52 - 1.6
Arsenic	F713VAOS1	06/07/2002	3.46	=	15	0.95 - 67.5	0.83 - 30
Barium	F713VAOS1	06/07/2002	82.7	J	800	1.8 - 1,980	6.1 - 91
Beryllium	F713VAOS1	06/07/2002	0.181	J	32	0.13 - 1.6	0.15 - 1.6
Cadmium	F713VAOS1	06/07/2002	**11.5**	=	4	0.06 - 1.5	0.08 - 0.96
Calcium	F713VAOS1	06/07/2002	15,700	=	NL	167 - 182,000	323 - 22,900
Chromium, Total	F713VAOS1	06/07/2002	73	J	19	2.3 - 567	1.6 - 75.2
Cobalt	F713VAOS1	06/07/2002	4.57	J	1,000	0.35 - 111	0.41 - 14.9
Copper	F713VAOS1	06/07/2002	419	=	5,300	0.47 - 866	1.3 - 192
Iron	F713VAOS1	06/07/2002	22,800	=	NL	1,050 - 30,600	924 - 35,800
Lead	F713VAOS1	06/07/2002	310	=	400	1 - 400	1.8 - 322
Magnesium	F713VAOS1	06/07/2002	1,190	J	NL	31 - 14,800	76.5 - 9,140
Manganese	F713VAOS1	06/07/2002	145	=	480	0.93 - 508	4.9 - 1,120
Mercury	F713VAOS1	06/07/2002	0.15	J	1	0.03 - 2.7	0.04 - 0.9
Nickel	F713VAOS1	06/07/2002	66.8	J	65	0.6 - 71.5	0.85 - 19.7
Potassium	F713VAOS1	06/07/2002	195	J	NL	45.6 - 2,620	106 - 3,440
Selenium	F713VAOS1	06/07/2002	0.82	J	2.5	0.44 - 4	0.4 - 2.4
Silver	F713VAOS1	06/07/2002	1.63	J	17	0.75 - 5	ND
Sodium	F713VAOS1	06/07/2002	76	J	NL	11.9 - 28,200	20.8 - 1,430
Vanadium	F713VAOS1	06/07/2002	13.1	=	3,000	1.1 - 60.4	1.6 - 71.9
Zinc	F713VAOS1	06/07/2002	1,150	=	6,000	1.9 - 855	5.8 - 438

TABLE 2-3
Analytes Detected in OWS Sediment at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Surface Soil Background Range[b]	Subsurface Soil Background Range[b]
Semivolatile Organic Compounds							
2-Methylnaphthalene	F713VAOS1	06/07/2002	6.980	=	11	NA	NA
Benzo[a]Anthracene	F713VAOS1	06/07/2002	0.436	J	1	0.616	0.627
bis(2-Ethylhexyl) Phthalate	F713VAOS1	06/07/2002	13.400	=	1,800	NA	NA
Chrysene	F713VAOS1	06/07/2002	0.689	J	80	0.62	0.616
Fluoranthene	F713VAOS1	06/07/2002	0.825	J	2,100	NA	NA
Naphthalene	F713VAOS1	06/07/2002	1.77	J	42	NA	NA
Phenanthrene	F713VAOS1	06/07/2002	3.770	=	NL	NA	NA
Pyrene	F713VAOS1	06/07/2002	1.330	J	2,100	NA	NA
Volatile Organic Compounds							
Ethylbenzene	F713VAOS1	06/07/2002	0.160	SJ	0.65	NA	NA
	F713VAOS1	07/09/2002	0.129	J			
Toluene	F713VAOS1	06/07/2002	0.0862	SJ	0.6	NA	NA
Xylenes, Total	F713VAOS1	06/07/2002	4.43	SJ	9	NA	NA
	F713VAOS1	07/09/2002	4.69	=			
Pesticides							
Endrin Aldehyde	F713VAOS1	06/07/2002	0.0749	=	0.5	NA	NA
p,p'-DDE	F713VAOS1	06/07/2002	0.006	J	27	NA	NA
p,p'-DDT	F713VAOS1	06/07/2002	0.129	=	16	NA	NA

Note: OWS contents are conservatively compared to criteria for subsurface soil.

Concentrations shown outlined and in bold print indicate exceedance of conservative subsurface soil screening criteria.

All values are presented in units of milligrams per kilogram (mg/kg).

[a] SSLs are from the *EPA Soil Screening Guidance: User's Guide*; DAF=1.0 for VOCs, DAF=10 for others.

[b] Background Range values for metals are the minimum and maximum concentrations detected in Zones E and F combined grid samples. Background values for BEQs and its components are from base-wide background concentrations.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

SJ Indicates an estimated concentration, used for screening purposes only.

TABLE 2-4
Analytes Detected in OWS Water at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/*RBC*[a]	Zone F BRC	Zone E BRC
Metals							
Aluminum	F713ZAOS1	06/07/2002	129	J	*3,700*	224	2,810
Antimony	F713ZAOS1	06/07/2002	**7.79**	J	6	0.82	NA
Barium	F713ZAOS1	06/07/2002	6.25	J	2,000	94.3	211
Calcium	F713ZAOS1	06/07/2002	7,300	=	NL	NA	NA
Chromium, Total	F713ZAOS1	06/07/2002	1.36	J	100	2.05	12.3
Copper	F713ZAOS1	06/07/2002	17.4	J	1,300	ND	2.7
Iron	F713ZAOS1	06/07/2002	272	=	*1,100*	51,600 - 62,300 *	144 - 76,600 *
Lead	F713ZAOS1	06/07/2002	2.42	J	15	ND	4.8
Magnesium	F713ZAOS1	06/07/2002	248	J	NL	NA	NA
Manganese	F713ZAOS1	06/07/2002	6.77	J	*73*	2,010	2,560
Potassium	F713ZAOS1	06/07/2002	1,510	J	NL	NA	NA
Sodium	F713ZAOS1	06/07/2002	1,670	J	NL	NA	NA
Vanadium	F713ZAOS1	06/07/2002	4.54	J	*26*	1.58	11.4
Zinc	F713ZAOS1	06/07/2002	52.5	=	*1,100*	ND	27.3

Note: OWS contents are conservatively compared to criteria for shallow groundwater.

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

Concentrations in bold type and outlined exceed the MCL/RBC and the Zone BRC.

[a] RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (HI=0.1)

* Range of grid sample concentrations; no BRC calculated.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available

ND No detections in grid samples

NL No MCL or RBC listed for analyte

TABLE 2-5
COPC Refinement, Subsurface Soil at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

		Parameter	**beta-BHC**	
		SSL (DAF=10)	0.0015	
Sample Location	**Date Sampled**	**Units**	**Concentration**	**Qualifier**
F713SB001	06/07/2002	mg/kg	0.0021	U
F713SB002	06/07/2002	mg/kg	**0.0037**	J
F713SB003	06/07/2002	mg/kg	0.0026	U

The concentration in bold type exceeds the SSL (DAF=10). The SSL is from the *EPA Soil Screening Guidance: User's Guide*; Appendix A (1996).

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

U Indicates that the analyte is not detected; value is detection limit.

TABLE 2-6
COPC Refinement, Groundwater at AOC 713
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

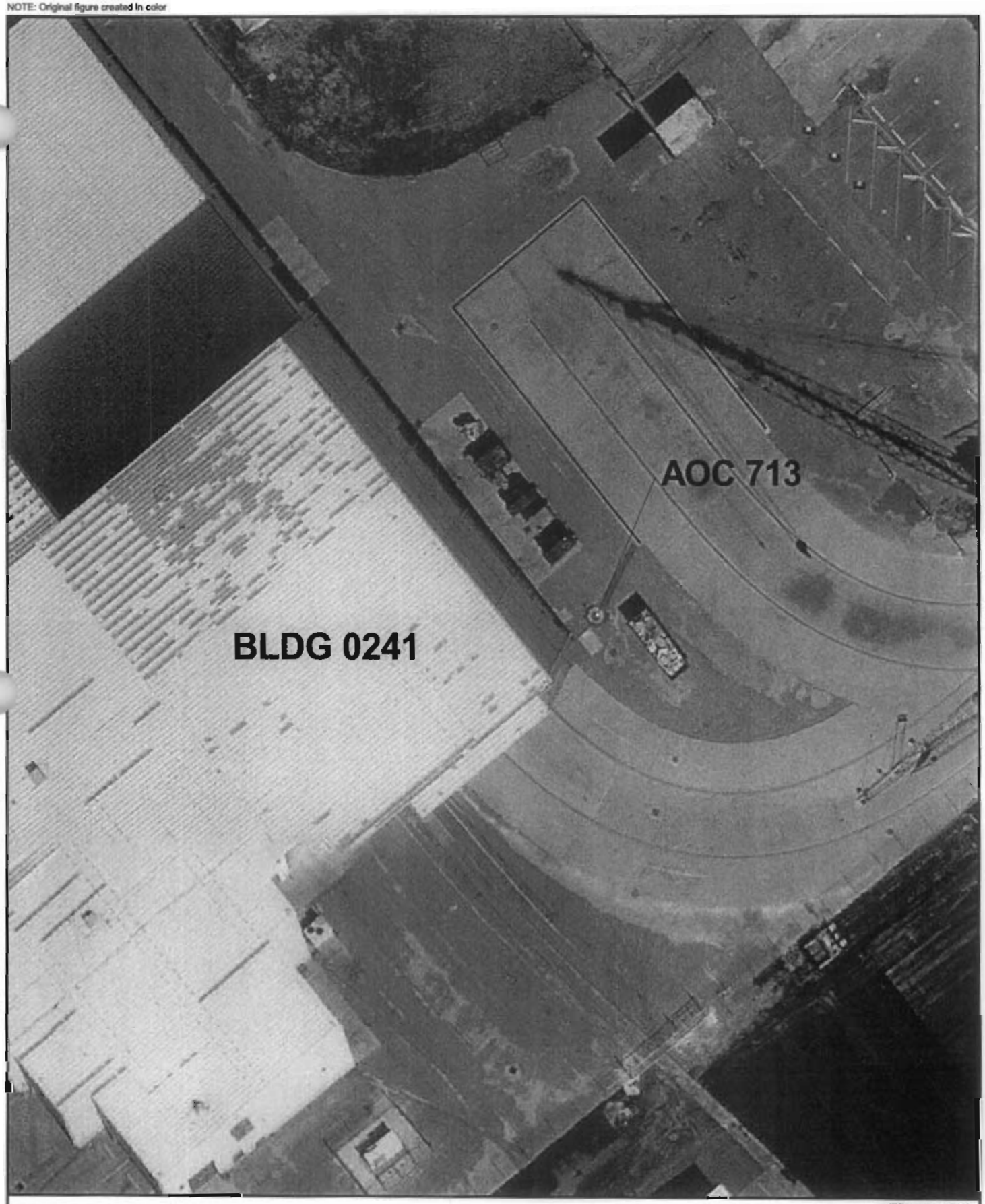
		Parameter	**Naphthalene**	
		RBC[a]	*6.5*	
Sample Location	**Date Sampled**	**Units**	**Concentration**	**Qualifier**
F713GP001	06/11/2002	µg/L	0.74	J
F713GP002	06/11/2002	µg/L	9.8	U
F713GP003	06/11/2002	µg/L	9.8	U

[a] No primary MCL exists for naphthalene. The RBC is from EPA Region III RBC (October 2000) table.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

U Indicates that the analyte is not detected; value is detection limit.

NOTE: Aerial Photo Date is 1997
NOTE: Original figure created in color



N

0 40 80 Feet

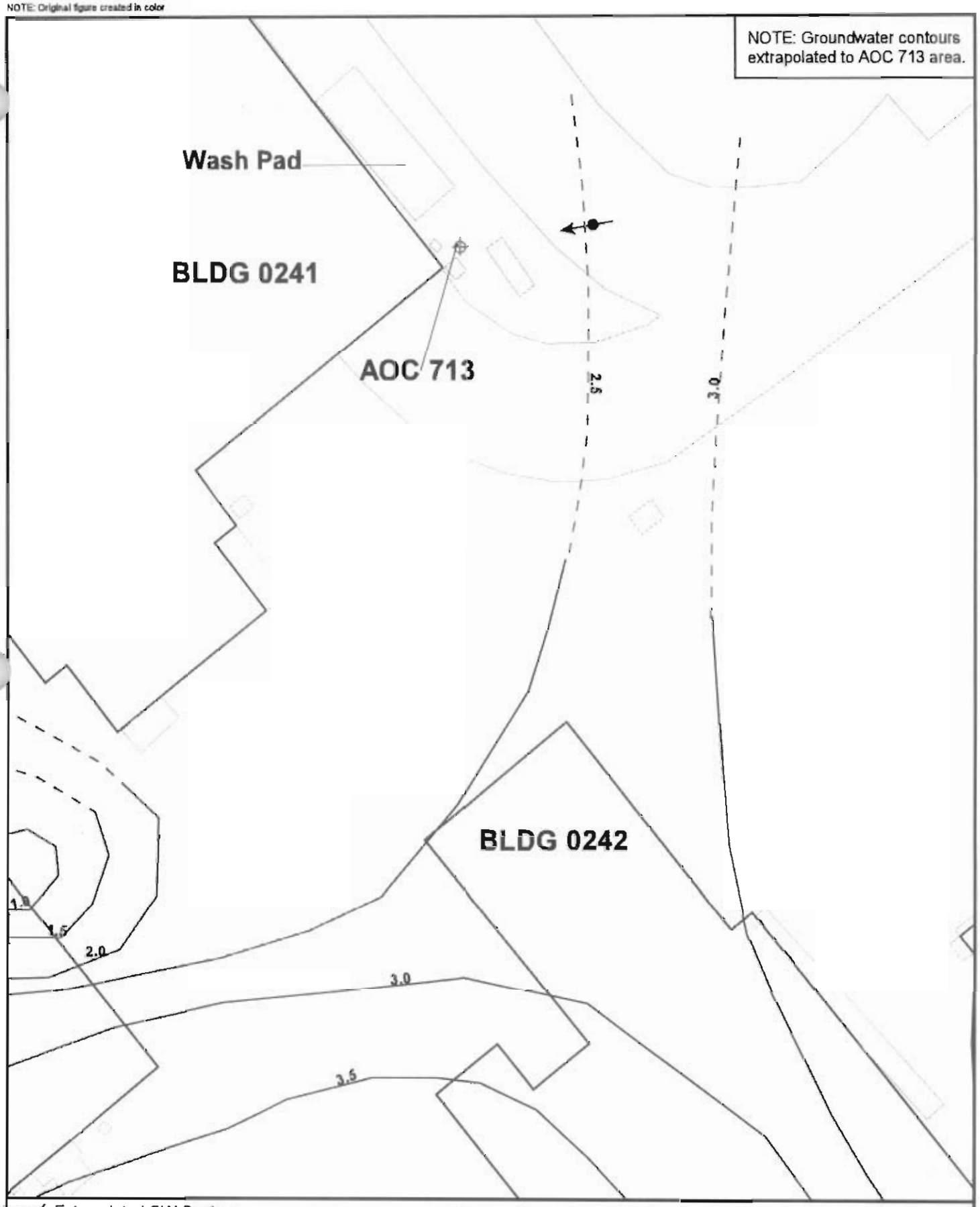
1 inch = 40 feet

Figure 2-1
Aerial Photo of AOC 713
Charleston Naval Complex
Confirmatory Sampling Investigation

CH2MHILL

File Path: d:\1\gis\projects\zone_f\aoc_713_aoc_720\aprs\fig2-1.apr, Date: 03 Sep 2002 11:20, User: DSANTOS, EGIS: Charleston Naval Complex - Figure 2-1 Aerial Photo of AOC 713

NOTE: Original figure created in color



Extrapolated GW Contour
Inferred GW Contour
Known GW Contour
GW Flow Direction
Oil Water Separator AOC
Roads - Lines
Buildings

N

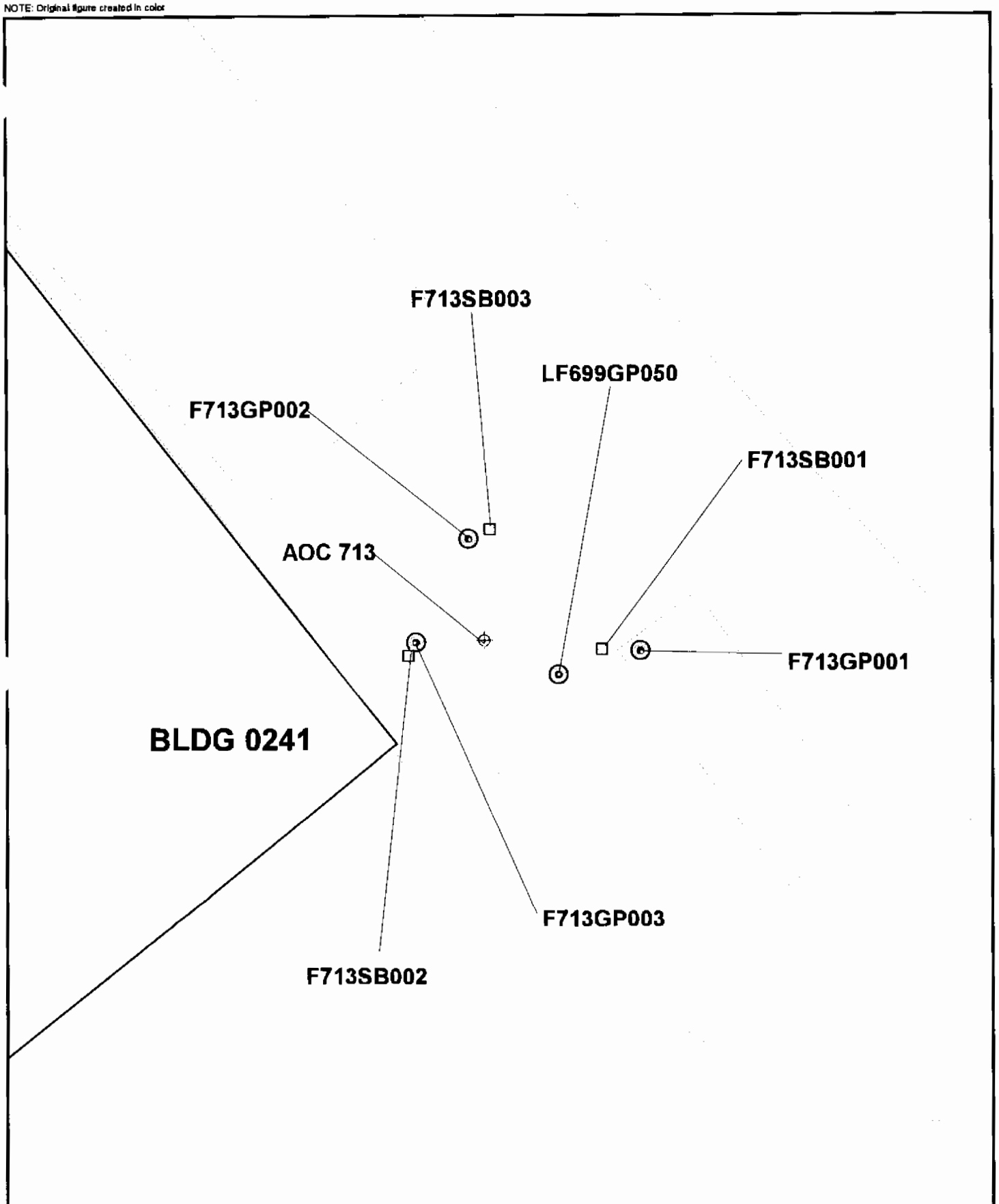
0 50 100 Feet

1 inch = 50 feet

Figure 2-2
Groundwater Potentiometric Contours
December 31, 2001
AOC 713
Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

NOTE: Original figure created in color



Groundwater Probe Sample
Subsurface Soil Sample
Oil Water Separator AOC
Buildings
Roads - Lines

N

0 10 20 Feet

1 inch = 10 feet

Figure 2-3
CSI Samples, AOC 713

Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

Section 3.0

3.0 AOC 716 CSI – Oil/Water Separator at Building 1024

3.1 Description of AOC 716

AOC 716 is described in the 2001 RFA as the OWS system located outside of the north wall of Building 1024, the Pipe Shop and Warehouse, which is located within Zone E. The OWS at AOC 716 serviced effluent from floor drains and from a sump that collected overflow of operational solvents such as acid from dip tanks. A report of the wastewater lines prepared by Davis and Floyd (1998) indicates that effluent from the OWS drained to the sanitary sewer and waste oil discharged to a 250-gallon underground storage tank (UST) located between the building and the OWS. Figure 3-1 shows an aerial photograph (dated 1997) of the Building 1024 and AOC 716 area. Photographs of AOC 716 are presented in Appendix A.

The area surrounding AOC 716 has been investigated as part of the Zone L RFI, SWMU 37 (EnSafe, 1998). The area surrounding AOC 716 is paved with asphaltic concrete. The surface surrounding AOC 716 is relatively flat with no clear slope; surface water at AOC 716 is likely to flow toward the east. Groundwater contours prepared in 2000 indicate that groundwater flows toward the north (toward Dry Dock 5 on the Cooper River). Groundwater flow is likely to be influenced by tidal fluctuations (the site is located 450 ft from the Cooper River). The groundwater depth at the OWS is approximately 5 ft bls.

Building 1024 was constructed in 1915 and has been used as a livery stable, air conditioning repair facility, pipe shop, and storage facility for the Navy. The current shipyard tenant uses it as a pipe shop.

No information regarding the construction of the OWS or adjacent UST has been located. The OWS is a 3-ft deep, 2.4 x 3.4-ft rectangular concrete structure, with a steel cover at surface grade. Piping from the OWS to the UST, visible at approximately 1 ft bls, is plugged. Two vent pipes related to the UST are located within the approximately 3 ½-ft space between the OWS and the building.

3.2 Environmental Sampling at AOC 716

Soil and groundwater samples were collected in the AOC 716 area for the Zone L, SWMU 37 RFI. The OWS at Building 1024 and its connection with the sanitary sewer was specifically investigated for any potential leaks in the past. A monitoring well located at the OWS was also sampled for the AOC 716 CSI. Figure 3-2 presents the Zone L RFI samples collected in the vicinity of AOC 716, as well as the monitoring well. Within 50 ft of AOC 716, subsurface soil at four locations was sampled from borings, groundwater was sampled at one location by DPT methods, and one nearby monitoring well installed as part of SWMU 37 investigation was used to evaluate groundwater. In addition, samples of the OWS sludge and water were collected to determine if contamination is present in the OWS. These sampling results are described below. The complete data sets for the samples collected for the Zone L RFI are located in the *Zone L RFI Report, Revision 0* (EnSafe, 1998). The summary of data for the CSI sampling (OWS contents and a groundwater sample) are presented in Appendix F of this report. Data validation summary discussions for the 2002 data are provided in Appendix D.

3.2.1 Soil Samples

In 1997, four subsurface soil samples were collected around the OWS system for the SWMU 37 RFI. Samples from stations LE037SB001 through LE037SB004 were analyzed for cyanide, VOCs, SVOCs, and metals; samples from LE037SB002 through LE037SB004 were also analyzed for PCBs and pesticides. Although these samples are presented as surface soil samples in the CNC geographic information system (GIS), they were actually collected below land surface, approximately between the depths of the OWS piping and its base.

Analytes detected in the soil samples are listed in Table 3-1. Concentrations were compared to SSLs from the *EPA Soil Screening Guidance, Appendix A* (1996). The SSL values were based on DAFs of 1.0 for VOCs and 10 for other analytes. The metals concentrations in soils were also compared to background concentrations for subsurface soil from Zone E grid samples. The results of the screening evaluation comparing site soil and groundwater detected concentrations to the criteria listed above are discussed below.

Metals in Soil Samples

As presented in Table 3-1, all metals in the soil samples were detected at concentrations within their background ranges. Thus, no metals COPCs were identified in soil at AOC 716.

Organic Compounds in Soil Samples

As shown in Table 3-1, trace levels of SVOCs, pesticides, and PCBs were detected in the soil samples at concentrations below practical quantitation limits. Concentrations of these compounds were less than SSLs, indicating that the levels of these chemicals do not present a leachability concern to area groundwater. Aroclor-1260 was detected in two samples at concentrations of 0.080 and 0.091 mg/kg, which is less than the unrestricted (i.e., residential) land use RBC for this PCB. No SSL is listed for Aroclor-1260, however PCBs tend to remain highly adsorbed to soil particles. Site-specific SSLs calculated for PCBs at other sites within the CNC resulted in values much greater than 1 mg/kg (see *Corrective Measures Study Work Plan, SWMU 17, Zone H, Revision 0* [CH2M-Jones, 2001]) indicating that PCBs are not likely migrating from soil to groundwater due to high Kocs, and low solubility. Thus, the detected PCB at AOC 716 is not expected to migrate to groundwater at the site; the groundwater data do not indicate a PCB presence. No organic COPCs were identified in soil at AOC 716.

3.2.2 Groundwater Samples

In 1997, a groundwater sample was collected by DPT along the sanitary sewer for the SWMU 37 RFI. Sample station LE037GP033 was located approximately 40 ft from AOC 716. This groundwater sample was analyzed for cyanide, VOCs, and metals. No cyanide or VOCs were detected in the sample. As with the other OWS data, metals data from unscreened DPT groundwater samples are not used in assessing OWS contamination conditions, as the potential presence of soil particulates in water samples may result in false positives and elevated concentrations.

Groundwater monitoring well LE037GW001 was installed adjacent to AOC 716, originally for the Zone L, SWMU 37 investigation. As reported in the Zone L RFI report, this monitoring well was sampled in 1997 for cyanide, VOCs, PCBs/pesticides, and metals. Though SVOCs were not analyzed in the groundwater sample, the soil samples from this area did not indicate the presence of SVOC COPCs. Therefore leachability to groundwater from SVOC releases to soil is not a concern for this area. In addition, the August 2002 resampling of this well included the analysis for SVOCs, as discussed below.

In 2002, another groundwater sample was collected for the AOC 716 CSI from well LE037GW001. This sample was analyzed for VOCs, SVOCs, PCBs/pesticides, and metals.

The inorganic and organic analytes detected in groundwater at LE037GW001 from both the 1997 and 2002 sampling events are listed in Table 3-2. The concentrations were compared to MCLs; where MCLs do not exist they were compared to tap water RBCs from the EPA Region III October 2000 tables, in which noncarcinogenic RBCs are adjusted for HI = 0.1. The

metals concentrations were also compared to BRCs for shallow groundwater from Zone E. The results of the screening analysis are presented below.

Metals in Groundwater Samples

As seen in Table 3-2, metals detected in the groundwater sample from LE037GW001 were below screening criteria and BRCs. No metal COPCs were identified in groundwater at AOC 716.

Organic Compounds in Groundwater Samples

SVOCs, PCBs, and pesticides were analyzed in the monitoring well samples; none were detected. Trace amounts of trichloroethene, toluene, and 1,2-dichloroethene(total) were the only VOCs detected in groundwater at AOC 716, at estimated concentrations less than their MCLs. No organic COPCs were identified in groundwater at AOC 716.

3.2.3 OWS Contents Samples

On June 5, 2002, samples of sludge and water were collected from the OWS and analyzed for VOCs, SVOCs, PCBs/pesticides, and metals. As discussed in the data validation summary report in Appendix D, a laboratory oversight required the recollection and reanalysis of the sludge sample for VOCs. The original data was provided by the laboratory, however, it was qualified with an "S, " to be used for screening purposes only, due to the problems identified by the laboratory. The resampling data met all applicable QC requirements. Tables 3-3 and 3-4 present the analytes detected in the OWS. The contents of the OWS are not an exposure concern for human or ecological receptors, however the subsurface soil and the groundwater screening criteria are used for comparison to determine if the detected concentrations require remedial actions to prevent future releases.

The screening comparison results for the OWS contents are discussed briefly below.

Metals in OWS Contents

Metals were detected in both sludge and water samples at concentrations comparable to background values for both surface soil and shallow groundwater, though this medium is likely to be more 'washed," removing lighter parts of the soil matrix. Although the water sample had copper and zinc concentrations higher than background groundwater levels, they were much lower than the screening criteria (MCL/RBC). The area groundwater had copper and zinc within background levels.

VOCs in OWS Contents

As presented in Table 3-3, trace amounts of solvents (acetone, methyl ethyl ketone, and tetrachloroethene) and petroleum hydrocarbons (ethylbenzene, toluene, and xylenes) were detected in the OWS sludge. These VOCs were not detected in the OWS water sample. None of the detected list of compounds exceeded the screening criteria for leachability.

SVOCs in OWS Contents

As presented in Table 3-3, PAHs and phthalate compounds were detected in the OWS sludge. Benzoic acid was the only SVOC detected in the OWS water sample. None of the detected chemicals exceed the conservative screening criteria for leachability to groundwater. The SVOCs detected in the sludge are likely from surface runoff from asphalt paved parking and industrial areas in the vicinity of the OWS. They are not in the dissolved form, indicating they are probably particulate bound and not a leachability concern.

Pesticides and PCBs in OWS Contents

As presented in Table 3-3, the PCBs Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected in the sludge sample at a maximum concentration of 0.369 mg/kg. PCBs were not detected in the OWS water sample. No pesticides were detected in the sludge or the OWS water. The SSLs for PCBs are likely to be greater than 1 mg/kg, based on site-specific calculations conducted for SWMU 17 (CH2M-Jones, 2001), which is not exceed by the PCBs levels detected in the sludge.

3.3 Investigation Summary – AOC 716

The metals concentrations detected in subsurface soil and groundwater samples at AOC 716 are similar to the Zone E background levels, indicating naturally occurring concentrations and not impacts from releases from the AOC 716 OWS system. Although traces of organic compounds were detected in soil, OWS contents, and groundwater samples collected in the vicinity of the OWS, the concentrations in environmental media were below the conservative screening criteria, and detected concentrations are reflective of the general industrial setting at CNC and Zone E. No compounds were identified as COPCs at AOC 716, thus no current or future human health or ecological impacts are identified from current conditions at this OWS.

3.4 AOC 716 CSI Conclusions and Recommendations

The following conclusions are drawn from the site condition evaluation. Recommendations for AOC 716 site disposition are also included at the end:

- The OWS and UST are adjacent to each other, and RFI and CSI samples were collected surrounding the units.
- Soil was sampled at four locations and groundwater was sampled at two locations within 55 ft of AOC 716.
- Soil, groundwater, and OWS contents (sludge and water) samples were analyzed for the full range of VOCs, SVOCs, pesticides, PCBs, and metals.
- Conservative screening by comparing with unrestricted land use-based screening criteria and background levels did not identify any chemicals above the criteria, thus no COPCs were identified for any of the above listed media.
- No leaks/spills/releases above acceptable criteria are noted from the OWS/UST system.

Based on the data discussed above, it is concluded that sufficient data exist to evaluate AOC 716. The data do not show a potential threat to human health or the environment from the OWS at AOC 716. Therefore, AOC 716 is recommended for NFA status.

TABLE 3-1
Analytes Detected in Subsurface Soil at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]
Metals						
Aluminum	LE037SB001	05/20/1997	7,940	=	NL	1,220 - 29,900
	LE037SB002	06/07/1997	5,600	=		
	LE037SB003	06/07/1997	5,050	=		
	LE037SB004	06/07/1997	4,640	=		
Arsenic	LE037SB001	05/20/1997	5.4	=	15	0.83 - 26
Barium	LE037SB001	05/20/1997	24.0	=	800	6.1 - 91
	LE037SB002	06/07/1997	13.2	=		
	LE037SB003	06/07/1997	12.3	=		
	LE037SB004	06/07/1997	13.1	=		
Beryllium	LE037SB001	05/20/1997	0.54	J	32	0.15 - 1.6
Cadmium	LE037SB002	06/07/1997	0.28	J	4	0.13 - 0.96
	LE037SB003	06/07/1997	0.11	J		
	LE037SB004	06/07/1997	0.18	J		
Calcium	LE037SB001	05/20/1997	48,200	J	NL	323 - 22,900
	LE037SB002	06/07/1997	3,940	=		
	LE037SB003	06/07/1997	3,410	=		
	LE037SB004	06/07/1997	15,600	=		
Chromium, Total	LE037SB001	05/20/1997	27.0	=	19	1.6 - 75.2
	LE037SB002	06/07/1997	12.7	=		
	LE037SB003	06/07/1997	6.5	=		
	LE037SB004	06/07/1997	6.2	=		
Cobalt	LE037SB001	05/20/1997	2.5	J	1,000	0.41 - 14.9
	LE037SB002	06/07/1997	5.0	=		
	LE037SB003	06/07/1997	5.8	=		
	LE037SB004	06/07/1997	3.3	=		
Copper	LE037SB001	05/20/1997	20.4	=	5,300	1.3 - 192
	LE037SB002	06/07/1997	19.3	=		

TABLE 3-1
Analytes Detected in Subsurface Soil at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]
Copper	LE037SB003	06/07/1997	7.6	=	5,300	1.3 - 192
	LE037SB004	06/07/1997	5.4	=		
Iron	LE037SB001	05/20/1997	9,100	J	NL	924 – 35,800
	LE037SB002	06/07/1997	3,360	=		
	LE037SB003	06/07/1997	2,170	=		
	LE037SB004	06/07/1997	2,460	=		
Lead	LE037SB001	05/20/1997	79.8	=	400	1.8 - 322
	LE037SB002	06/07/1997	108.0	=		
	LE037SB003	06/07/1997	14.2	=		
	LE037SB004	06/07/1997	11.9	=		
Magnesium	LE037SB001	05/20/1997	1,570	J	NL	76.5 – 9,140
	LE037SB002	06/07/1997	600	=		
	LE037SB003	06/07/1997	268	=		
	LE037SB004	06/07/1997	430	=		
Manganese	LE037SB001	05/20/1997	78.4	=	480	4.9 - 625
	LE037SB002	06/07/1997	18.9	=		
	LE037SB003	06/07/1997	13.7	=		
	LE037SB004	06/07/1997	19.7	=		
Mercury	LE037SB001	05/20/1997	0.10	=	1	0.04 - 0.9
	LE037SB002	06/07/1997	0.09	=		
	LE037SB003	06/07/1997	0.04	=		
Nickel	LE037SB001	05/20/1997	6.0	J	65	0.85 - 19.7
	LE037SB002	06/07/1997	4.4	J		
	LE037SB003	06/07/1997	3.3	J		
	LE037SB004	06/07/1997	3.4	J		
Potassium	LE037SB001	05/20/1997	570	J	NL	106 – 3,440
	LE037SB002	06/07/1997	208	J		
	LE037SB003	06/07/1997	122	J		

TABLE 3-1
Analytes Detected in Subsurface Soil at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]
Potassium	LE037SB004	06/07/1997	176	J	NL	106 – 3,440
Selenium	LE037SB001	05/20/1997	0.39	J	2.5	0.59 - 2.4
	LE037SB002	06/07/1997	0.35	J		
	LE037SB003	06/07/1997	0.42	J		
Sodium	LE037SB002	06/07/1997	199	J	NL	20.8 – 1,430
	LE037SB003	06/07/1997	164	J		
	LE037SB004	06/07/1997	167	J		
Thallium	LE037SB001	05/20/1997	0.74	J	0.35	0.4 - 1.2 *
Vanadium	LE037SB001	05/20/1997	19.9	=	3,000	1.6 - 71.9
	LE037SB002	06/07/1997	7.5	=		
	LE037SB003	06/07/1997	4.5	=		
	LE037SB004	06/07/1997	4.5	=		
Zinc	LE037SB001	05/20/1997	48.6	J	6,000	5.8 - 438
	LE037SB002	06/07/1997	408.0	=		
	LE037SB003	06/07/1997	24.7	=		
	LE037SB004	06/07/1997	14.5	=		
Pesticides/PCBs						
Aroclor-1260	LE037SB002	06/07/1997	0.0800	J	NL	NA
	LE037SB003	06/07/1997	0.0910	=		
Endrin	LE037SB003	06/07/1997	0.0043	J	0.5	NA
Endrin Aldehyde	LE037SB003	06/07/1997	0.0041	J	0.5	NA
gamma-Chlordane	LE037SB001	05/20/1997	0.0018	J	5	NA
p,p'-DDT	LE037SB003	06/07/1997	0.0059	J	16	NA
Semivolatile Organic Compounds						
Fluoranthene	LE037SB001	05/20/1997	0.0480	J	2,200	NA
Pyrene	LE037SB001	05/20/1997	0.0460	J	2,100	NA

All values are presented in units of milligrams per kilogram (mg/kg).

TABLE 3-1
Analytes Detected in Subsurface Soil at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Subsurface Soil Background Range[b]

* Thallium not detected in Zone E grid samples; values shown are base-wide range of concentrations.

[a] SSLs are from the *EPA Soil Screening Guidance: User's Guide*; DAF=1.0 for VOCs, DAF=10 for others.

[b] Background Range values are the minimum and maximum concentrations detected in Zone E grid samples.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

TABLE 3-2
Analytes Detected in Groundwater at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/*RBC*[a]	Zone E BRC
Metals						
Aluminum	LE037GW001	08/04/1997	957	=	*3,700*	2,810
	LE037GW001	08/05/2002	843	=		
Antimony	LE037GW001	08/04/1997	1.9	J	6	NA
Arsenic	LE037GW001	08/04/1997	6.9	J	50	18.7
	LE037GW001	08/05/2002	15.6	=		
Barium	LE037GW001	08/04/1997	20.5	=	2,000	211
	LE037GW001	08/05/2002	27.3	J		
Calcium	LE037GW001	08/04/1997	88,200	=	NL	NA
	LE037GW001	08/05/2002	150,000	=		
Chromium, Total	LE037GW001	08/04/1997	1.7	J	100	12.3
	LE037GW001	08/05/2002	2.1	J		
Copper	LE037GW001	08/04/1997	3.6	J	1,300	2.7
	LE037GW001	08/05/2002	11.6	J		
Iron	LE037GW001	08/04/1997	1,150	=	*1,100*	144 - 76,600 *
	LE037GW001	08/05/2002	4,590	=		
Magnesium	LE037GW001	08/04/1997	18,200	=	NL	NA
	LE037GW001	08/05/2002	34,500	=		
Manganese	LE037GW001	08/04/1997	395	=	*73*	2,560
	LE037GW001	08/05/2002	578	=		
Nickel	LE037GW001	08/04/1997	3.5	J	*73*	15.2
	LE037GW001	08/05/2002	9.95	J		
Potassium	LE037GW001	08/04/1997	10,800	=	NL	NA
	LE037GW001	08/05/2002	19,200	=		
Sodium	LE037GW001	08/04/1997	21,600	=	NL	NA
	LE037GW001	08/05/2002	147,000	=		
Vanadium	LE037GW001	08/04/1997	5.4	J	*26*	11.4

TABLE 3-2
Analytes Detected in Groundwater at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/*RBC*[a]	Zone E BRC
Vanadium	LE037GW001	08/05/2002	2.36	J	*26*	11.4
Zinc	LE037GW001	08/04/1997	10	J	*1,100*	27.3
	LE037GW001	08/05/2002	81.9	=		
Volatile Organic Compounds						
1,1-Dichloroethane	LE037GW001	08/05/2002	0.7	J	80	NA
1,2-Dichloroethene (total)	LE037GW001	08/04/1997	2.0	J	70	NA
	LE037GW001	08/05/2002	2.7	J		
cis-1,2-Dichloroethene	LE037GW001	08/05/2002	2.7	J	70	NA
Toluene	LE037GW001	08/05/2002	0.51	J	1,000	NA
Trichloroethene	LE037GW001	08/05/2002	0.8	J	5	NA
Semivolatile Organic Compounds						
Benzoic Acid	LE037GW001	08/04/1997	2.0	J	*15,000*	NA

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

[a] RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (HI=0.1)

* Range of grid sample concentrations; no BRC calculated.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available/not applicable

ND No detections in grid samples

NL No MCL or RBC listed

TABLE 3-3
Analytes Detected in OWS Sediment at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Surface Soil Background Range[b]	Subsurface Soil Background Range[b]
Metals							
Aluminum	E716VAOS1	6/5/2002	2,280	=	NL	261 - 20,500	1,220 - 29,900
Antimony	E716VAOS1	6/5/2002	1.36	J	2.5	0.5 - 7.4	0.52 - 1.6
Arsenic	E716VAOS1	6/5/2002	1.97	J	15	0.95 - 68	0.83 - 30
Barium	E716VAOS1	6/5/2002	65.1	J	800	1.8 - 1,980	6.1 - 91
Calcium	E716VAOS1	6/5/2002	11,100	=	NL	167 - 182,000	323 - 22,900
Chromium, Total	E716VAOS1	6/5/2002	103	J	19	2.3 - 567	1.6 - 75.2
Cobalt	E716VAOS1	6/5/2002	3.39	J	1,000	0.35 - 111	0.41 - 14.9
Copper	E716VAOS1	6/5/2002	357	=	5,300	0.47 - 866	1.3 - 192
Iron	E716VAOS1	6/5/2002	17,000	=	NL	1,050 - 30,600	924 - 35,800
Lead	E716VAOS1	6/5/2002	293	=	400	1 - 400	1.8 - 322
Magnesium	E716VAOS1	6/5/2002	1,370	J	NL	31 - 14,800	76.5 - 9,140
Manganese	E716VAOS1	6/5/2002	165	=	480	0.93 - 508	4.9 - 1,120
Mercury	E716VAOS1	6/5/2002	0.314	J	1	.03 - 2.7	0.04 - 0.9
Nickel	E716VAOS1	6/5/2002	25.5	J	65	0.6 - 72	0.85 - 19.7
Potassium	E716VAOS1	6/5/2002	419	J	NL	46 - 2,620	106 - 3,440
Selenium	E716VAOS1	6/5/2002	0.433	J	2.5	0.57 - 4	0.4 - 2.4
Silver	E716VAOS1	6/5/2002	0.572	J	17	0.75 - 0.91	ND
Sodium	E716VAOS1	6/5/2002	62.8	J	NL	12 - 28,200	20.8 - 1,430
Vanadium	E716VAOS1	6/5/2002	11	J	3,000	1.1 - 60	1.6 - 71.9
Zinc	E716VAOS1	6/5/2002	3,360	=	6,000	1.9 - 855	5.8 - 438
Semivolatile Organic Compounds							
2-Methylnaphthalene	E716VAOS1	6/5/2002	0.0568	J	11	NA	NA
Acenaphthene	E716VAOS1	6/5/2002	0.0212	J	290	NA	NA

TABLE 3-3
Analytes Detected in OWS Sediment at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Surface Soil Background Range[b]	Subsurface Soil Background Range[b]
BEQs	E716VAOS1	6/5/2002	0.478	=	NL	1.304	1.400
Benzo[a]Anthracene	E716VAOS1	6/5/2002	0.0937	J	1	0.616	0.627
Benzo[a]Pyrene	E716VAOS1	6/5/2002	0.168	J	4	0.598	0.623
Benzo[b]Fluoranthene	E716VAOS1	6/5/2002	0.209	J	2.5	0.608	NA
Benzyl Butyl Phthalate	E716VAOS1	6/5/2002	1.2	=	930	NA	NA
bis(2-Ethylhexyl) Phthalate	E716VAOS1	6/5/2002	2.09	=	1,800	NA	NA
Chrysene	E716VAOS1	6/5/2002	0.145	J	80	0.62	0.616
Dimethyl Phthalate	E716VAOS1	6/5/2002	0.162	J	NL	NA	NA
Fluoranthene	E716VAOS1	6/5/2002	0.256	J	2,100	NA	NA
Fluorene	E716VAOS1	6/5/2002	0.0237	J	280	NA	NA
Phenanthrene	E716VAOS1	6/5/2002	0.158	J	NL	NA	NA
Pyrene	E716VAOS1	6/5/2002	0.201	J	2,100	NA	NA
Volatile Organic Compounds							
Acetone	E716VAOS1	6/5/2002	0.071	SJ	0.8	NA	NA
	E716VA0S1	7/9/2002	0.042	J			
Ethylbenzene	E716VAOS1	6/5/2002	0.0016	SJ	0.65	NA	NA
	E716VA0S1	7/9/2002	0.003	J			
Methyl ethyl ketone (2-Butanone)	E716VAOS1	6/5/2002	0.0167	SJ	0.4	NA	NA
	E716VA0S1	7/9/2002	0.0111	J			
PCE	E716VAOS1	6/5/2002	0.00073	SJ	0.003	NA	NA
Toluene	E716VAOS1	6/5/2002	0.0027	SJ	0.6	NA	NA
	E716VA0S1	7/9/2002	0.0038	J			
Xylenes, Total	E716VAOS1	6/5/2002	0.014	SJ	9	NA	NA
	E716VA0S1	7/9/2002	0.018	=			

TABLE 3-3
Analytes Detected in OWS Sediment at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL[a]	Surface Soil Background Range[b]	Subsurface Soil Background Range[b]
PCBs/Pesticides							
PCB-1242 (Aroclor-1242)	E716VAOS1	6/5/2002	0.208	J	NL	NA	NA
PCB-1254 (Aroclor-1254)	E716VAOS1	6/5/2002	0.141	J	0.054	NA	NA
PCB-1260 (Aroclor-1260)	E716VAOS1	6/5/2002	0.369	J	NL	NA	NA

Note: OWS contents are conservatively compared to criteria for subsurface soil.

All values are presented in units of milligrams per kilogram (mg/kg).

[a] SSLs are from the *EPA Soil Screening Guidance: User's Guide*; DAF=1.0 for VOCs, DAF=10 for others.

[b] Background Range values for metals are the minimum and maximum concentrations detected in Zone E grid samples. Background values for BEQs and its components are from base-wide background concentrations.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

SJ Estimated concentration, used for screening only.

TABLE 3-4
Analytes Detected in OWS Water at AOC 716
CSI Report, AOC 713 (Zone F) and AOC 716 (Zone E), Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/*RBC*[a]	Zone E BRC
Metals						
Aluminum	E716ZAOS1	06/05/2002	110	J	*3,700*	2,810
Barium	E716ZAOS1	06/05/2002	246	=	2,000	211
Calcium	E716ZAOS1	06/05/2002	42,000	=	NL	NA
Chromium, Total	E716ZAOS1	06/05/2002	1.68	J	100	12.3
Copper	E716ZAOS1	06/05/2002	72.6	=	1,300	2.7
Iron	E716ZAOS1	06/05/2002	1,520	=	*1,100*	144 - 76,600 *
Lead	E716ZAOS1	06/05/2002	10.6	=	15	4.8
Magnesium	E716ZAOS1	06/05/2002	2,210	J	NL	NA
Manganese	E716ZAOS1	06/05/2002	144	=	*73*	2,560
Nickel	E716ZAOS1	06/05/2002	3.82	J	*73*	15.2
Potassium	E716ZAOS1	06/05/2002	3,280	J	NL	NA
Selenium	E716ZAOS1	06/05/2002	2.94	J	50	NA
Sodium	E716ZAOS1	06/05/2002	5,780	=	NL	NA
Vanadium	E716ZAOS1	06/05/2002	1.58	J	*26*	11.4
Zinc	E716ZAOS1	06/05/2002	225	=	*1,100*	27.3
Semivolatile Organic Compounds						
Benzoic Acid	E716ZAOS1	06/05/2002	10.7	J	*15,000*	NA

Note: OWS contents are conservatively compared to criteria for shallow groundwater.

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

[a] RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (HI=0.1)

* Range of grid sample concentrations; no BRC calculated.

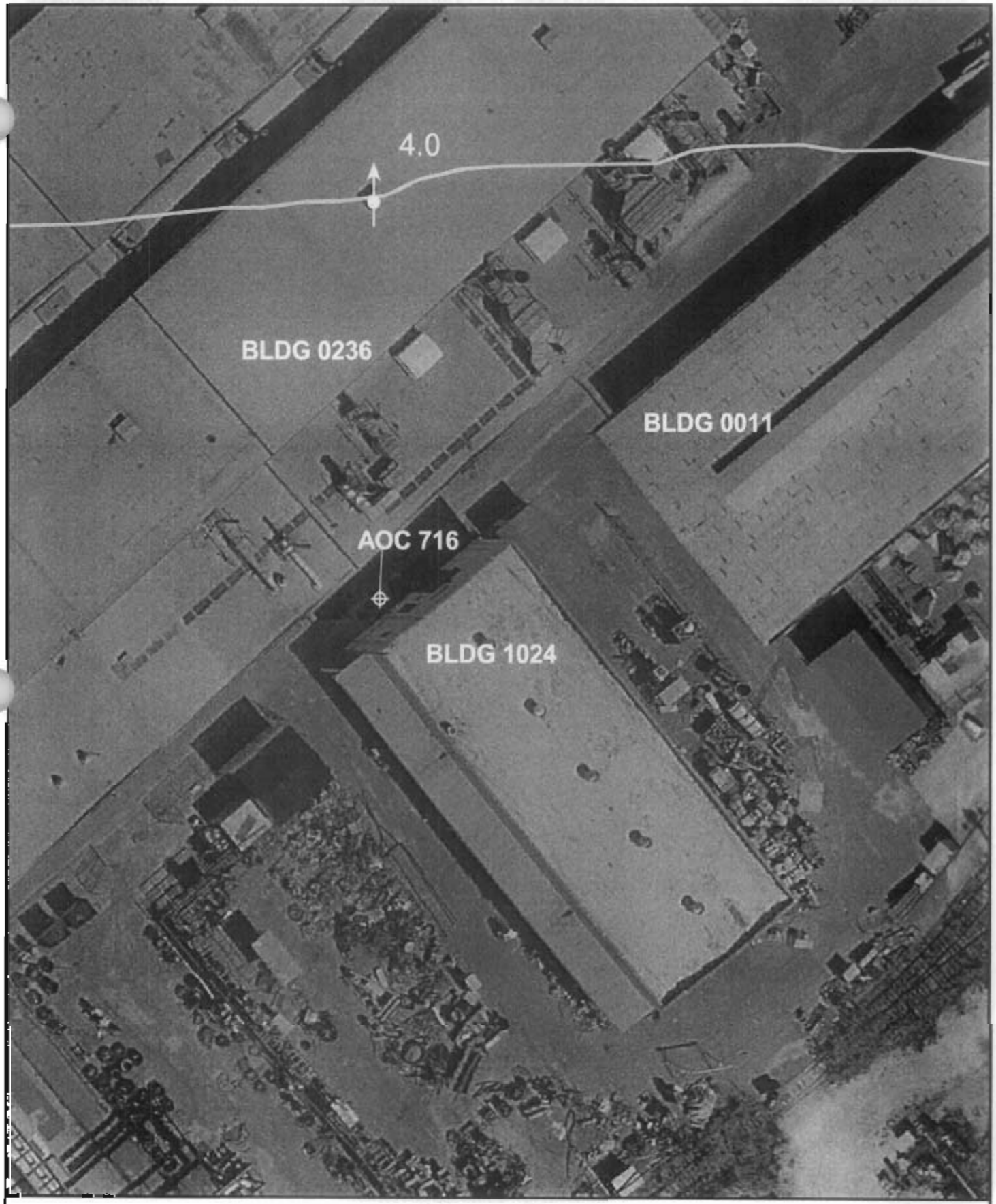
= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available/not applicable

NL No MCL or RBC listed for analyte.

NOTE: Aerial Photo Date is 1997
NOTE: Original figure created in color



Oil / Water Separator AOC

Groundwater Flow Direction

Shallow Groundwater Contour, (ft/msl)

N

0 40 80 Feet

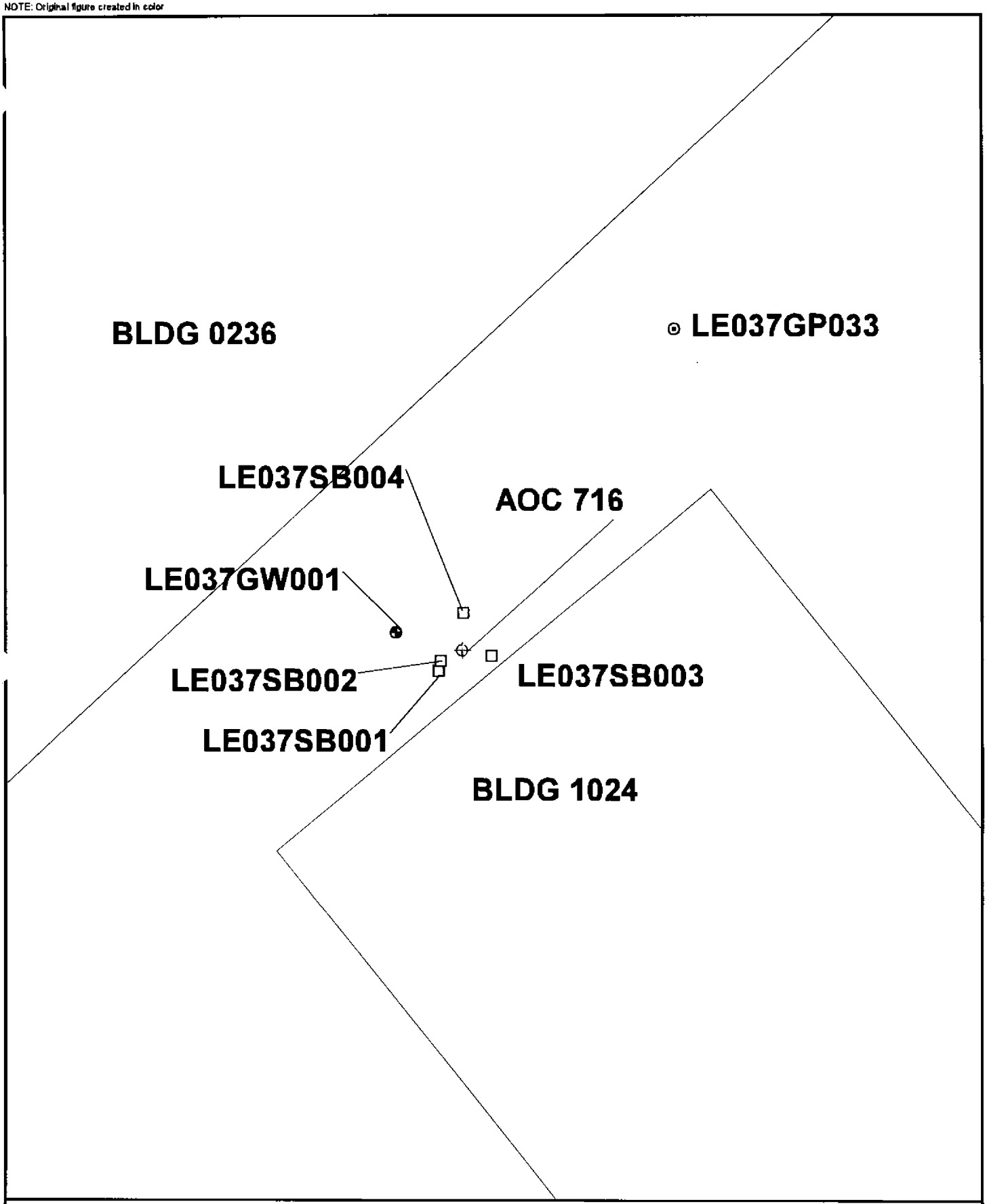
1 inch = 40 feet

Figure 3-1
Aerial Photo of AOC 716
Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

File Path: I:\18gis\projects\navy\aoc_712_714\aprs\aoc712_714_figure4-1.apr, Date: 03 Sep 2002 10:57, User: DSANTOS, EGIS: Charleston Naval Complex - Figure 4-1 Aerial Photo of AOC 716

NOTE: Original figure created in color



Soil Boring
Groundwater Probe
Groundwater Well
Oil / Water Separator AOC
Buildings

N

0 15 30 Feet

1 inch = 15 feet

Figure 3-2
AOC 716 RFI Sampling Locations
Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

Section 4.0

4.0 CSI Conclusions and Recommendations

This section summarizes the conclusions and recommendations resulting from the data evaluation for the CSIs at AOCs 713 and 716.

4.1 AOC 713 CSI Conclusions and Recommendations

The following conclusions may be applied to AOC 713:

- The OWS was precast in one piece and installed in 1987. It collects water from drain lines inside Building 241, from the wash pad north of the OWS, and apparently from surface runoff along the end of the crane rails. It drains to the sanitary sewer system.
- Soil was sampled at three locations and analyzed for the full range of VOCs, SVOCs, pesticides, PCBs, and metals. Groundwater was sampled at four locations surrounding the OWS and analyzed for the full range of VOCs, SVOCs, pesticides, and PCBs. The contents of the OWS were sampled and analyzed for the full range of VOCs, SVOCs, pesticides, PCBs, and metals.
- Soil samples, groundwater samples, and OWS content samples indicate no COCs at AOC 713 requiring further action.

It is concluded that sufficient data exist to evaluate AOC 713 and that the data indicate that there are no significant releases. Therefore, an NFA status is recommended for AOC 713.

4.2 AOC 716 CSI Conclusions and Recommendations

The following conclusions may be applied to AOC 716:

- No information regarding the construction of the OWS and adjacent UST has been identified. The AOC is located against the north wall of Building 1024. Its dimensions are 2.4-ft wide, 3.4-ft long, and 3-ft deep.
- Soil was sampled at four locations and groundwater was sampled at two locations within 55 ft of AOC 716. Soil, groundwater, and OWS contents (sludge and water) samples were analyzed for the full range of VOCs, SVOCs, pesticides, PCBs, and metals.

- Conservative screening of environmental media by comparing with unrestricted land use-based screening criteria and background levels did not identify any chemicals above the criteria, thus no COPCs were identified for any of the above listed media.
- No releases above acceptable criteria are noted from the OWS/UST system.

It is concluded that sufficient data exist to evaluate AOC 716 and that the data show no potential threat to human health or the environment from OWS use at AOC 716. Therefore, AOC 716 is recommended for NFA status.

Section 5.0

5.0 References

CH2M-Jones. *Corrective Measures Study Work Plan, SWMU 17, Zone H, Revision 0.* January 2001.

CH2M-Jones. *Sampling and Analysis Plan; AOC 713, Zone F; AOC 720, Zone F; Oil/Water Separators; Charleston Naval Complex*. May 2002.

Davis and Floyd. *Evaluation of Drainage System Serving Charleston Naval Complex.* September 1998.

EnSafe Inc. *Zone E RFI Report, NAVBASE Charleston*. Revision 0. November 1997a.

EnSafe Inc. *Zone F RFI Report, NAVBASE Charleston*. Revision 0. December 31, 1997b.

EnSafe Inc. *Zone L RFI Report, NAVBASE Charleston*. Revision 0. December 31, 1998.

U.S. Navy. *RCRA Facility Assessment (RFA) Revision 1 Charleston Naval Complex*. Southern Division. February 2001.

Appendix A

AOC 713. Oil/water Separator is manhole in foreground; wash pad in background.

AOC 716. Oil/water Separator is beneath dumpster. Monitoring well LE037GW001 shows next to dumpster.

AOC 716. Edge of Oil/Water Separator shows beneath dumpster. UST is located between OWS and Building 1024.

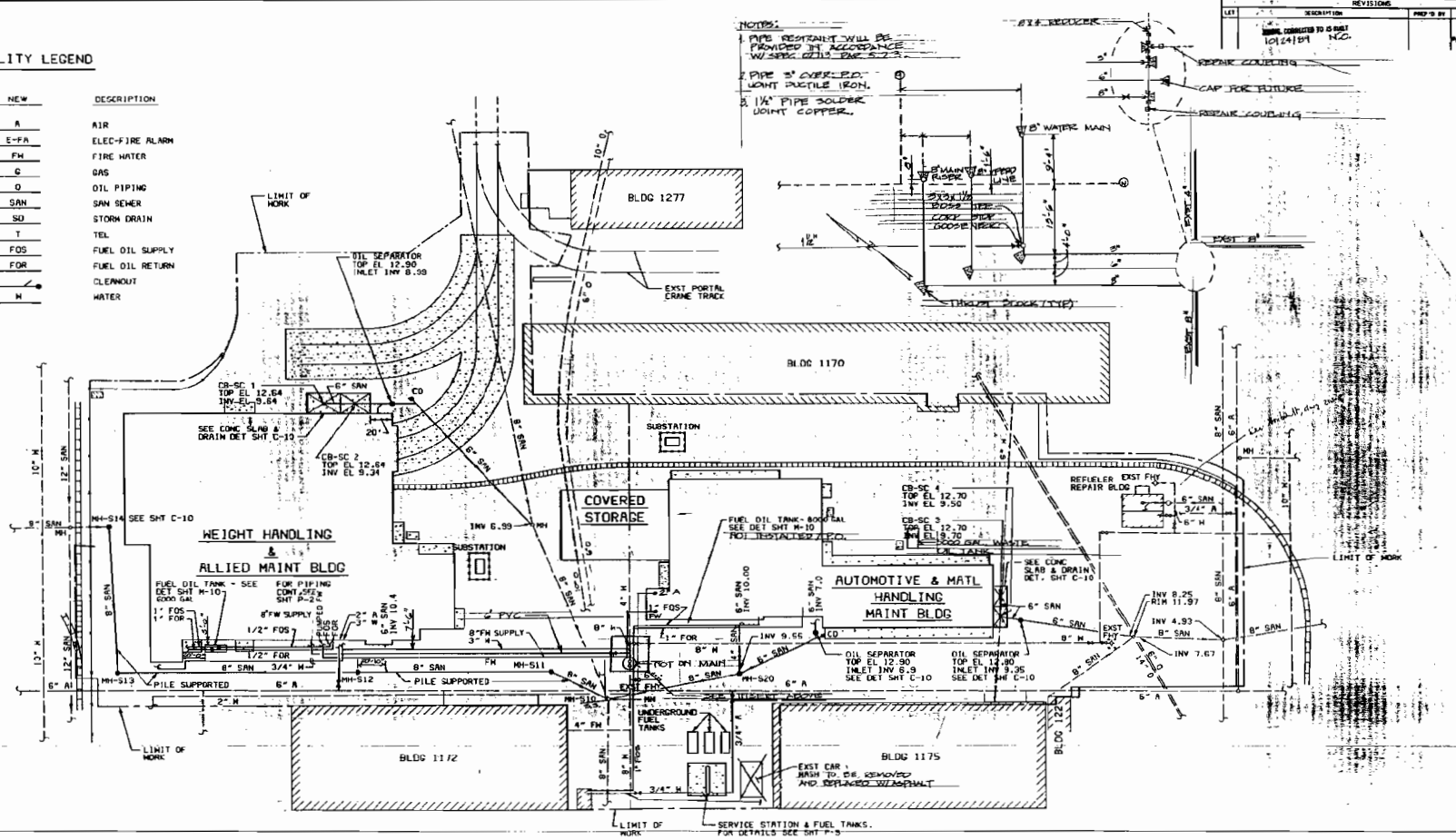
Appendix B

UTILITY LEGEND

EXISTING	NEW	DESCRIPTION
A	A	AIR
E-FA	E-FA	ELEC-FIRE ALARM
FW	FW	FIRE WATER
G	G	GAS
O	O	OIL PIPING
SAN	SAN	SAN SEWER
SD	SD	STORM DRAIN
T	T	TEL
	FOS	FUEL OIL SUPPLY
	FOR	FUEL OIL RETURN
		CLEANOUT
	W	WATER

NOTES:

1. PIPE RESTRAINT WILL BE PROVIDED IN ACCORDANCE W/ SPEC. 02113 PAR. 3.7.3.
2. PIPE 3" OVER: P.O. JOINT DUCTILE IRON.
3. 1½" PIPE SOLDER JOINT COPPER.



NOTES:

1. MIN COVER OVER WATER PIPING SHALL BE 2'.
2. FOR SAN SEWER PROFILES, SEE SHT C-7.
3. FOR LEGEND AND ABBREVIATION, SEE SHT G-2.
4. FOR DETAILS OF WATER AND SEWER APPURTENANCES, SEE SHT C-9 AND C-10.

SITE PLAN - WATER, SEWER AND AIR PIPING

SCALE: 1" = 40'

GRAPHIC SCALE

1"=40' 40' 20' 0 40' 80'

REVISIONS			
LET	DESCRIPTION	PREP'D BY	DATE
	MODIFIED, CORRECTED TO IS BUILT NO.		10/24/89

FOR OFFICIAL USE ONLY

RECORD DRAWING DATE 10/3/89

MAYES, SEAY, MATHEW & WATTS ARCHITECTS-ENGINEERS-PLANNERS ROANOKE, VA. ROCKVILLE, MD.

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND SOUTHERN DIVISION CHARLESTON, S. C.

NAVAL STATION CHARLESTON, SOUTH CAROLINA

CRANE (EQUIPMENT) MAINTENANCE BUILDING

CIVIL SITE PLAN WATER, SEWER AND AIR PIPING

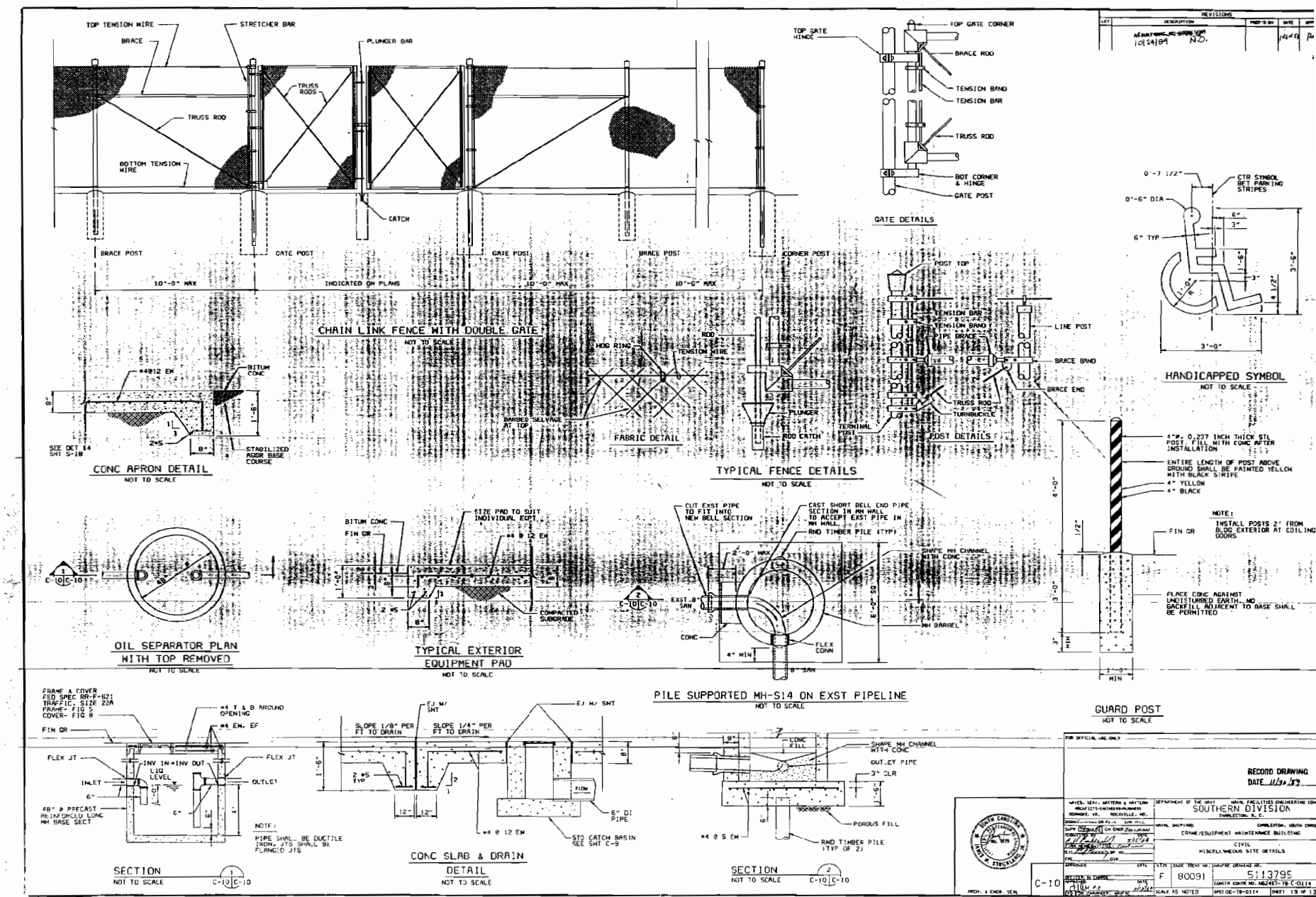
ARCH. & ENGR. SEAL

C-5

APPROVED	DATE
REVIEWED BY CENSOR	
APPROVED	DATE
10-4-88	
PROJECT ENGINEER, MAYES	

SIZE	CODE IDENT NO.	HVAC DRAWING NO.
F	80091	5113790
SCALE AS NOTED		CONTR CONTR NO. N62467-78-C-0114
		SPEC DG-78-0114 SHEET 8 OF

4121-R


TOP TENSION WIRE
BRACE
STRETCHER BAR
PLUNGER BAR
TRUSS RODS
TRUSS ROD
BOTTOM TENSION WIRE
CATCH
BRACE POST
GATE POST
GATE POST
BRACE POST
CORNER POST
10'-0" MAX
INDICATED ON PLANS
10'-0" MAX
10'-0" MAX
CHAIN LINK FENCE WITH DOUBLE GATE
NOT TO SCALE
TOP GATE HINGE
TOP GATE CORNER
BRACE ROD
TENSION BAND
TENSION BAR
TRUSS ROD
BOT CORNER & HINGE
GATE POST
GATE DETAILS
POST TOP
TENSION BAR
TENSION BAND
PIPE BRACE
LINE POST
BRACE BAND
BRACE END
TRUSS ROD
TURNBUCKLE
POST DETAILS
HOG RING
ROD
TENSION WIRE
BARBED SELVAGE AT TOP
FABRIC DETAIL
PLUNGER
ROD CATCH
TERMINAL POST
TYPICAL FENCE DETAILS
NOT TO SCALE
#4@12 EW
BITUM CONC
SEE DET 14 SHT S-18
2#5
8"
STABILIZED AGGR BASE COURSE
CONC APRON DETAIL
NOT TO SCALE
0'-7 1/2"
CTR SYMBOL BET PARKING STRIPES
0'-6" DIA
6" TYP
3'-0"
HANDICAPPED SYMBOL
NOT TO SCALE
4"ø, 0.237 INCH THICK STL POST. FILL WITH CONC AFTER INSTALLATION
ENTIRE LENGTH OF POST ABOVE GROUND SHALL BE PAINTED YELLOW WITH BLACK STRIPE
4" YELLOW
4" BLACK
FIN GR
NOTE:
INSTALL POSTS 2' FROM BLDG EXTERIOR AT COILING DOORS
PLACE CONC AGAINST UNDISTURBED EARTH. NO BACKFILL ADJACENT TO BASE SHALL BE PERMITTED
OIL SEPARATOR PLAN WITH TOP REMOVED
NOT TO SCALE
BITUM CONC
FIN GR
SIZE PAD TO SUIT INDIVIDUAL EQPT
#4 @ 12 EW
2#5
8"
COMPACTED SUBGRADE
TYPICAL EXTERIOR EQUIPMENT PAD
NOT TO SCALE
CUT EXST PIPE TO FIT INTO NEW BELL SECTION
CAST SHORT BELL END PIPE SECTION IN MH WALL TO ACCEPT EXST PIPE IN MH WALL
RND TIMBER PILE (TYP)
SHAPE MH CHANNEL WITH CONC
EXST 8" SAN
MH BARREL
CONC
FLEX CONN
4" MIN
8" SAN
PILE SUPPORTED MH-S14 ON EXST PIPELINE
NOT TO SCALE
GUARD POST
NOT TO SCALE
FRAME & COVER PER SPEC RR-F-621 TRAFFIC, SIZE 22A FRAME- FIG 5 COVER- FIG 8
#4 T & B AROUND OPENING
#4 EW, EF
FIN GR
FLEX JT
INV IN=INV OUT
LIQ LEVEL
INLET
OUTLET
48" ø PRECAST REINFORCED CONC MH BASE SECT
NOTE:
PIPE SHALL BE DUCTILE IRON. JTS SHALL BE FLANGED JTS
SECTION
NOT TO SCALE
EJ W/ SNT
SLOPE 1/8" PER FT TO DRAIN
SLOPE 1/4" PER FT TO DRAIN
2 #5 TYP
#4 @ 12 EW
FLOW
6" DI PIPE
STD CATCH BASIN SEE SHT C-9
CONC SLAB & DRAIN DETAIL
NOT TO SCALE
CONC FILL
SHAPE MH CHANNEL WITH CONC
OUTLEY PIPE
3" CLR
POROUS FILL
#4 @ 5 EW
RND TIMBER PILE (TYP OF 2)
SECTION
NOT TO SCALE
REVISIONS
DESCRIPTION
DATE
RECORD DRAWING
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, S.C.
NAVAL SHIPYARD
CHARLESTON, SOUTH CAROLINA
CRANE/EQUIPMENT MAINTENANCE BUILDING
CIVIL
MISCELLANEOUS SITE DETAILS
C-10
F
80091
5113795
SCALE AS NOTED
SPEC 06-78-0114
SHEET 13 OF 13
H241-13

Appendix C

Metals, Subsurface Soil and OWS Sediment AOC 713	StationID	F713SB001		F713SB001		F713SB002		F713SB002	
	SampleID	713SB00102 (3-5ft)		713SB00102 (3-5ft)		713SB00202 (3-5ft)		713SB00202 (3-5ft)	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		6/7/2002	
	DateExtracted	6/17/2002		6/21/2002		6/17/2002		6/21/2002	
	DateAnalyzed	6/19/2002		6/24/2002		6/19/2002		6/24/2002	
	SDGNumber	61741		61741		61741		61741	
Parameter	**Units**								
Aluminum	mg/kg	36600	=			11100	=		
Antimony	mg/kg	0.741	UJ			0.535	UJ		
Arsenic	mg/kg	15.3	=			5.9	=		
Barium	mg/kg	45.2	J			18.7	J		
Beryllium	mg/kg	1.34	J			0.34	J		
Cadmium	mg/kg	0.213	J			0.108	U		
Calcium	mg/kg	5210	=			10500	=		
Chromium, Total	mg/kg	45.9	J			14.5	J		
Cobalt	mg/kg	8.01	J			2.13	J		
Copper	mg/kg	27.1	=			6.97	=		
Iron	mg/kg	34200	=			7750	=		
Lead	mg/kg	43.2	=			12.4	=		
Magnesium	mg/kg	4150	=			871	J		
Manganese	mg/kg	512	=			70.2	=		
Nickel	mg/kg	15.3	J			4.87	J		
Potassium	mg/kg	1930	J			425	J		
Selenium	mg/kg	1.26	J			0.298	UJ		
Silver	mg/kg	0.178	U			0.128	U		
Sodium	mg/kg	981	J			118	J		
Thallium	mg/kg	0.771	U			0.557	U		
Vanadium	mg/kg	77.6	=			18.4	=		
Zinc	mg/kg	113	=			29.5	=		
Mercury	mg/kg			0.186	J			0.06	J

Metals, Subsurface Soil and OWS Sediment AOC 713

	StationID	F713SB003		F713SB003		F713VAOS1		F713VAOS1	
	SampleID	713SB00302 (3-5ft)		713SB00302 (3-5ft)		713VAOS1M1		713VAOS1M1	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		6/7/2002	
	DateExtracted	6/17/2002		6/21/2002		6/17/2002		6/21/2002	
	DateAnalyzed	6/19/2002		6/24/2002		6/19/2002		6/24/2002	
	SDGNumber	61741		61741		61741		61741	
Parameter	**Units**								
Aluminum	mg/kg	47600	=			2400	=		
Antimony	mg/kg	0.953	UJ			21.5	J		
Arsenic	mg/kg	22	=			3.46	=		
Barium	mg/kg	56.1	J			82.7	J		
Beryllium	mg/kg	1.71	J			0.181	J		
Cadmium	mg/kg	0.241	J			11.5	=		
Calcium	mg/kg	7960	=			15700	=		
Chromium, Total	mg/kg	59.6	J			73	J		
Cobalt	mg/kg	8.07	J			4.57	J		
Copper	mg/kg	35.6	=			419	=		
Iron	mg/kg	42800	=			22800	=		
Lead	mg/kg	53.6	=			310	=		
Magnesium	mg/kg	5050	=			1190	J		
Manganese	mg/kg	524	=			145	=		
Nickel	mg/kg	19.4	J			66.8	J		
Potassium	mg/kg	2380	J			195	J		
Selenium	mg/kg	1.67	J			0.82	J		
Silver	mg/kg	0.228	U			1.63	J		
Sodium	mg/kg	1030	J			76	J		
Thallium	mg/kg	0.991	U			0.62	U		
Vanadium	mg/kg	96.5	=			13.1	=		
Zinc	mg/kg	129	=			1150	=		
Mercury	mg/kg			0.159	J			0.15	J

PCBs, Subsurface Soil and OWS Sediment AOC 713	StationID	F713SB001		F713SB002		F713SB003		F713SB003		F713VAOS1	
	SampleID	713SB00102 (3-5ft)		713SB00202 (3-5ft)		713SB00302 (3-5ft)		713SB00302RE (3-5ft)		713VAOS1M1	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		6/7/2002		6/7/2002	
	DateExtracted	6/11/2002		6/11/2002		6/11/2002		7/5/2002		6/11/2002	
	DateAnalyzed	6/18/2002		6/18/2002		6/18/2002		7/9/2002		6/18/2002	
	SDGNumber	61741		61741		61741		61741		61741	
Parameter	Units										
PCB-1016 (Arochlor 1016)	ug/kg	52.5	U	39.4	U	66.9	R	66.9	UJ	226	U
PCB-1221 (Arochlor 1221)	ug/kg	52.5	U	39.4	U	66.9	R	66.9	UJ	226	U
PCB-1232 (Arochlor 1232)	ug/kg	52.5	U	39.4	U	66.9	R	66.9	UJ	226	U
PCB-1242 (Arochlor 1242)	ug/kg	52.5	U	39.4	U	66.9	R	66.9	UJ	226	U
PCB-1248 (Arochlor 1248)	ug/kg	52.5	U	39.4	U	66.9	R	66.9	UJ	226	U
PCB-1254 (Arochlor 1254)	ug/kg	107	U	80.1	U	136	R	136	UJ	458	U
PCB-1260 (Arochlor 1260)	ug/kg	107	UJ	80.1	UJ	136	R	136	UJ	458	UJ

Pesticides, Subsurface Soil and OWS Sediment
AOC 713

	StationID	F713SB001		F713SB002		F713SB003		F713VAOS1	
	SampleID	713SB00102 (3-5ft)		713SB00202 (3-5ft)		713SB00302 (3-5ft)		713VAOS1M1	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		6/7/2002	
	DateExtracted	6/11/2002		6/11/2002		6/21/2002		6/11/2002	
	DateAnalyzed	6/19/2002		6/21/2002		6/28/2002		6/20/2002	
	SDGNumber	61741		61741		61741		61741	
Parameter	**Units**								
Aldrin	ug/kg	2.1	U	7.7	U	2.6	U	35.5	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/kg	2.1	U	7.7	U	2.6	U	35.5	U
Alpha-chlordane	ug/kg	2.1	U	18.7	J	2.6	U	35.5	U
Beta BHC (Beta Hexachlorocyclohexane)	ug/kg	2.1	U	3.7	J	2.6	U	35.5	U
Chlordane	ug/kg	20.6	U	194	=	26.3	U	355	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/kg	2.1	U	2.4	J	2.6	U	35.5	U
Dieldrin	ug/kg	4	U	1.6	J	5.1	U	68.4	U
Endosulfan I	ug/kg	2.1	U	7.7	U	2.6	U	35.5	U
Endosulfan II	ug/kg	4	U	14.9	U	5.1	U	68.4	U
Endosulfan Sulfate	ug/kg	4	U	5.6	J	0.41	J	68.4	U
Endrin Aldehyde	ug/kg	4	U	5.5	J	5.1	U	74.9	=
Endrin Ketone	ug/kg	4	U	3.7	J	5.1	U	68.4	U
Endrin	ug/kg	4	U	14.9	U	5.1	U	68.4	U
Gamma BHC (Lindane)	ug/kg	2.1	U	7.7	U	2.6	U	35.5	U
Gamma-chlordane	ug/kg	2.1	U	41.2	=	2.6	U	35.5	U
Heptachlor Epoxide	ug/kg	2.1	U	3.8	J	2.6	U	35.5	U
Heptachlor	ug/kg	2.1	U	4.8	J	2.6	U	35.5	U
Methoxychlor	ug/kg	20.6	U	10.2	J	26.3	U	355	U
p,p'-DDD	ug/kg	4	U	2.1	J	5.1	U	68.4	U
p,p'-DDE	ug/kg	4	U	1.2	J	5.1	U	5.6	J
p,p'-DDT	ug/kg	4	U	13.1	J	5.1	U	129	=
Toxaphene	ug/kg	132	U	495	U	168	U	2270	U

SVOCs, Subsurface Soil and OWS Sediment AOC 713	StationID	F713SB001		F713SB002		F713SB003		F713VAOS1	
	SampleID	713SB00102 (3-5ft)		713SB00202 (3-5ft)		713SB00302 (3-5ft)		713VAOS1M1	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		6/7/2002	
	DateExtracted	6/10/2002		6/10/2002		6/10/2002		6/10/2002	
	DateAnalyzed	6/13/2002		6/13/2002		6/12/2002		6/12/2002	
	SDGNumber	61741		61741		61741		61741	
Parameter	**Units**								
Benzo(g,h,i)Perylene	ug/kg	526	U	395	U	669	U	1810	U
Phenol	ug/kg	526	U	395	U	669	U	1810	U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/kg	526	U	395	U	669	U	1810	U
Bis(2-Chloroisopropyl)Ether	ug/kg	526	U	395	U	669	U	1810	U
2-Chlorophenol	ug/kg	526	U	395	U	669	U	1810	U
1,4-Dichlorobenzene	ug/kg	526	U	40.3	J	669	U	1810	U
Benzyl alcohol	ug/kg	526	UJ	395	UJ	669	U	1810	U
1,2-Dichlorobenzene	ug/kg	526	U	395	U	669	U	1810	U
1,3-Dichlorobenzene	ug/kg	526	U	395	U	669	U	1810	U
2-Methylphenol (o-Cresol)	ug/kg	526	U	395	U	669	U	1810	U
N-Nitrosodi-n-propylamine	ug/kg	526	U	395	U	669	U	1810	U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/kg	526	U	395	U	669	U	1810	U
Hexachloroethane	ug/kg	526	U	395	U	669	U	1810	U
Nitrobenzene	ug/kg	526	U	395	U	669	U	1810	U
Isophorone	ug/kg	526	U	395	U	669	U	1810	U
2-Nitrophenol	ug/kg	526	U	395	U	669	U	1810	U
2,4-Dimethylphenol	ug/kg	526	U	395	U	669	U	1810	U
bis(2-Chloroethoxy) Methane	ug/kg	526	U	395	U	669	U	1810	U
2,4-Dichlorophenol	ug/kg	526	U	395	U	669	U	1810	U
Benzoic acid	ug/kg	2550	U	1910	U	3240	U	8760	U
1,2,4-Trichlorobenzene	ug/kg	526	U	395	U	669	U	1810	U
Naphthalene	ug/kg	526	U	395	U	669	U	1770	J
4-Chloroaniline	ug/kg	526	U	395	U	669	U	1810	U
Hexachlorobutadiene	ug/kg	526	U	395	U	669	U	1810	U
4-Chloro-3-methylphenol	ug/kg	478	U	359	U	609	U	1640	U
2-Methylnaphthalene	ug/kg	526	U	395	U	669	U	6980	=
Hexachlorocyclopentadiene	ug/kg	526	U	395	UJ	669	U	1810	U
2,4,6-Trichlorophenol	ug/kg	526	U	395	U	669	U	1810	U
2,4,5-Trichlorophenol	ug/kg	2550	U	1910	U	3240	U	8760	U
2-Chloronaphthalene	ug/kg	526	U	395	U	669	U	1810	U

SVOCs, Subsurface Soil and OWS Sediment AOC 713

	StationID	F713SB001		F713SB002		F713SB003		F713VAOS1	
	SampleID	713SB00102 (3-5ft)		713SB00202 (3-5ft)		713SB00302 (3-5ft)		713VAOS1M1	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		6/7/2002	
	DateExtracted	6/10/2002		6/10/2002		6/10/2002		6/10/2002	
	DateAnalyzed	6/13/2002		6/13/2002		6/12/2002		6/12/2002	
	SDGNumber	61741		61741		61741		61741	
Parameter	**Units**								
2-Nitroaniline	ug/kg	526	U	395	U	669	U	1810	U
3-Nitroaniline	ug/kg	2550	U	1910	U	3240	U	8760	U
Dimethyl Phthalate	ug/kg	526	U	395	U	669	U	1810	U
2,6-Dinitrotoluene	ug/kg	526	U	395	U	669	U	1810	U
Acenaphthylene	ug/kg	526	U	395	U	669	U	1810	U
Acenaphthene	ug/kg	478	U	359	U	609	U	1640	U
2,4-Dinitrophenol	ug/kg	2550	U	1910	U	3240	U	8760	U
Dibenzofuran	ug/kg	526	U	395	U	669	U	1810	U
2,4-Dinitrotoluene	ug/kg	478	U	359	U	609	U	1640	U
Diethyl Phthalate	ug/kg	80.4	J	61.7	J	669	U	1810	U
4-Nitrophenol	ug/kg	2550	UJ	1910	UJ	3240	UJ	8760	UJ
Fluorene	ug/kg	526	U	395	U	669	U	1810	U
4-Chlorophenyl Phenyl Ether	ug/kg	526	U	395	U	669	U	1810	U
4,6-Dinitro-2-methylphenol	ug/kg	2550	U	1910	U	3240	U	8760	U
4-Nitroaniline	ug/kg	2550	U	1910	U	3240	U	8760	U
Diphenylamine	ug/kg	526	U	395	U	669	U	1810	U
4-Bromophenyl Phenyl Ether	ug/kg	526	U	395	U	669	U	1810	U
Hexachlorobenzene	ug/kg	526	U	395	U	669	U	1810	U
Pentachlorophenol	ug/kg	2550	U	1910	U	3240	U	8760	U
Phenanthrene	ug/kg	526	U	395	U	669	U	3770	=
Anthracene	ug/kg	526	U	395	U	669	U	1810	U
Di-n-butyl Phthalate	ug/kg	526	U	395	U	92.3	J	1810	U
Fluoranthene	ug/kg	526	U	30	J	669	U	825	J
Pyrene	ug/kg	526	U	34.6	J	669	U	1330	J
Benzyl Butyl Phthalate	ug/kg	526	U	395	U	669	U	1810	U
Benzo(a)Anthracene	ug/kg	526	U	395	U	669	U	436	J
3,3'-Dichlorobenzidine	ug/kg	1050	U	789	U	1340	U	3610	U
Chrysene	ug/kg	526	U	395	U	669	U	689	J
bis(2-Ethylhexyl) Phthalate	ug/kg	526	U	395	U	669	U	13400	=
Di-n-octylphthalate	ug/kg	526	U	395	U	669	U	1810	U

SVOCs, Subsurface Soil and OWS Sediment AOC 713

	StationID	F713SB001		F713SB002		F713SB003		F713VAOS1	
	SampleID	713SB00102 (3-5ft)		713SB00202 (3-5ft)		713SB00302 (3-5ft)		713VAOS1M1	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		6/7/2002	
	DateExtracted	6/10/2002		6/10/2002		6/10/2002		6/10/2002	
	DateAnalyzed	6/13/2002		6/13/2002		6/12/2002		6/12/2002	
	SDGNumber	61741		61741		61741		61741	
Parameter	**Units**								
Benzo(b)Fluoranthene	ug/kg	526	U	395	U	669	U	1810	U
Benzo(k)Fluoranthene	ug/kg	526	U	395	U	669	U	1810	U
Benzo(a)Pyrene	ug/kg	526	U	395	U	669	U	1810	U
Indeno(1,2,3-c,d)pyrene	ug/kg	526	U	395	U	669	U	1810	U
Dibenz(a,h)anthracene	ug/kg	526	U	395	U	669	U	1810	U
Carbazole	ug/kg	526	U	395	U	669	U	1810	U

VOCs, Subsurface Soil and OWS Sediment AOC 713

	StationID	F713SB001		F713SB002		F713SB003		F713SB004	
	SampleID	713SB00102 (3-5ft)		713SB00202 (3-5ft)		713SB00302 (3-5ft)		713SB00403 (3-5ft)	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		7/11/2002	
	DateExtracted	6/13/2002		6/13/2002		6/13/2002		7/15/2002	
	DateAnalyzed	6/13/2002		6/13/2002		6/13/2002		7/15/2002	
	SDGNumber	61741		61741		61741		63437	
Parameter	**Units**								
Chloromethane	ug/kg	16.2	SUJ	12	SUJ	19.5	SUJ	10.9	UJ
Vinyl chloride	ug/kg	16.2	SUJ	12	SUJ	19.5	SUJ	10.9	U
Bromomethane	ug/kg	16.2	SUJ	12	SUJ	19.5	SUJ	10.9	U
Chloroethane	ug/kg	16.2	SUJ	12	SUJ	19.5	SUJ	10.9	U
1,1-Dichloroethene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Acetone	ug/kg	169	SJ	12	SUJ	274	SJ	29.8	UJ
Carbon Disulfide	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Methylene Chloride	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
trans-1,2-Dichloroethene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,1-Dichloroethane	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Vinyl acetate	ug/kg	16.2	SUJ	12	SUJ	19.5	SUJ	10.9	UJ
Methyl ethyl ketone (2-Butanone)	ug/kg	27.8	SJ	12	SUJ	41.6	SJ	10.9	U
cis-1,2-Dichloroethylene	ug/kg	1.2	SJ	6	SUJ	9.7	SUJ	5.4	U
1,2-Dichloroethene (total)	ug/kg	1.2	SJ	6	SUJ	9.7	SUJ	5.4	U
Chloroform	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,1,1-Trichloroethane	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Carbon Tetrachloride	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,2-Dichloroethane	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Benzene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Trichloroethylene (TCE)	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,2-Dichloropropane	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Bromodichloromethane	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
2-Chloroethyl vinyl ether	ug/kg	16.2	SUJ	12	SUJ	19.5	SUJ	10.9	UJ
cis-1,3-Dichloropropene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	10.9	U
Toluene	ug/kg	0.62	SJ	0.6	SJ	9.7	SUJ	0.44	J
trans-1,3-Dichloropropene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U

VOCs, Subsurface Soil and OWS Sediment AOC 713	StationID	F713SB005		F713SB006		F713VA0S1		F713VAOS1	
	SampleID	713SB00503 (3-5ft)		713SB00603 (3-5ft)		713VA0S1M3		713VAOS1M1	
	DateCollected	7/11/2002		7/11/2002		7/9/2002		6/7/2002	
	DateExtracted	7/15/2002		7/15/2002		7/12/2002		6/13/2002	
	DateAnalyzed	7/15/2002		7/15/2002		7/12/2002		6/13/2002	
	SDGNumber	63437		63437		63281		61741	
Parameter	Units								
Chloromethane	ug/kg	10.9	UJ	28.1	UJ	1410	U	1370	SUJ
Vinyl chloride	ug/kg	10.9	U	28.1	U	1410	U	1370	SUJ
Bromomethane	ug/kg	10.9	U	28.1	U	1410	U	1370	SUJ
Chloroethane	ug/kg	10.9	U	28.1	U	1410	U	1370	SUJ
1,1-Dichloroethene	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Acetone	ug/kg	10.9	UJ	56.8	UJ	1410	UJ	1370	SUJ
Carbon Disulfide	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Methylene Chloride	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
trans-1,2-Dichloroethene	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
1,1-Dichloroethane	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Vinyl acetate	ug/kg	10.9	UJ	28.1	UJ	1410	UJ	1370	SUJ
Methyl ethyl ketone (2-Butanone)	ug/kg	10.9	U	28.1	U	1410	U	1370	SUJ
cis-1,2-Dichloroethylene	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
1,2-Dichloroethene (total)	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Chloroform	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
1,1,1-Trichloroethane	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Carbon Tetrachloride	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
1,2-Dichloroethane	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Benzene	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Trichloroethylene (TCE)	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
1,2-Dichloropropane	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Bromodichloromethane	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
2-Chloroethyl vinyl ether	ug/kg	10.9	UJ	28.1	UJ	1410	UJ	1370	SUJ
cis-1,3-Dichloropropene	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	10.9	U	28.1	U	1410	U	684	SUJ
Toluene	ug/kg	0.4	J	1.3	J	707	U	86.2	SJ
trans-1,3-Dichloropropene	ug/kg	5.4	U	14.1	U	707	U	684	SUJ

VOCs, Subsurface Soil and OWS Sediment AOC 713

	StationID	F713SB001		F713SB002		F713SB003		F713SB004	
	SampleID	713SB00102 (3-5ft)		713SB00202 (3-5ft)		713SB00302 (3-5ft)		713SB00403 (3-5ft)	
	DateCollected	6/7/2002		6/7/2002		6/7/2002		7/11/2002	
	DateExtracted	6/13/2002		6/13/2002		6/13/2002		7/15/2002	
	DateAnalyzed	6/13/2002		6/13/2002		6/13/2002		7/15/2002	
	SDGNumber	61741		61741		61741		63437	
Parameter	**Units**								
1,1,2-Trichloroethane	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
2-Hexanone	ug/kg	16.2	SUJ	12	SUJ	19.5	SUJ	10.9	U
Tetrachloroethylene (PCE)	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Dibromochloromethane	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Chlorobenzene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Ethylbenzene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	1.5	J
m+p Xylene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	4.3	J
o-Xylene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	1.1	J
Xylenes, Total	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	J
Styrene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
Bromoform	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,1,2,2-Tetrachloroethane	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,3-Dichlorobenzene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,4-Dichlorobenzene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,2-Dichlorobenzene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,2,4-Trichlorobenzene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U
1,2,3-Trichlorobenzene	ug/kg	8.1	SUJ	6	SUJ	9.7	SUJ	5.4	U

VOCs, Subsurface Soil and OWS Sediment AOC 713

	StationID	F713SB005		F713SB006		F713VA0S1		F713VAOS1	
	SampleID	713SB00503 (3-5ft)		713SB00603 (3-5ft)		713VA0S1M3		713VAOS1M1	
	DateCollected	7/11/2002		7/11/2002		7/9/2002		6/7/2002	
	DateExtracted	7/15/2002		7/15/2002		7/12/2002		6/13/2002	
	DateAnalyzed	7/15/2002		7/15/2002		7/12/2002		6/13/2002	
	SDGNumber	63437		63437		63281		61741	
Parameter	**Units**								
1,1,2-Trichloroethane	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
2-Hexanone	ug/kg	10.9	U	28.1	U	1410	U	1370	SUJ
Tetrachloroethylene (PCE)	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Dibromochloromethane	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Chlorobenzene	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Ethylbenzene	ug/kg	1.4	J	5.2	J	129	J	160	SJ
m+p Xylene	ug/kg	3.9	J	14.3	=	4690	=	4430	SJ
o-Xylene	ug/kg	1	J	3.9	J	707	U	684	SUJ
Xylenes, Total	ug/kg	5	J	18.2	=	4690	=	4430	SJ
Styrene	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
Bromoform	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
1,1,2,2-Tetrachloroethane	ug/kg	5.4	U	14.1	U	707	U	684	SUJ
1,3-Dichlorobenzene	ug/kg	5.4	U	14.1	UJ	707	U	684	SUJ
1,4-Dichlorobenzene	ug/kg	5.4	U	14.1	UJ	707	U	684	SUJ
1,2-Dichlorobenzene	ug/kg	5.4	U	14.1	UJ	707	U	684	SUJ
1,2,4-Trichlorobenzene	ug/kg	5.4	U	14.1	UJ	707	U	684	SUJ
1,2,3-Trichlorobenzene	ug/kg	5.4	U	14.1	UJ	707	U	684	SUJ

Metals, OWS Water
AOC 713

	StationID	F713ZAOS1		F713ZAOS1	
	SampleID	713ZAOS1M1		713ZAOS1M1	
	DateCollected	6/7/2002		6/7/2002	
	DateExtracted	6/14/2002		6/18/2002	
	DateAnalyzed	6/16/2002		6/18/2002	
	SDGNumber	61738		61738	
Parameter	**Units**				
Aluminum	ug/L			129	J
Antimony	ug/L			7.79	J
Arsenic	ug/L			3.97	U
Barium	ug/L			6.25	J
Beryllium	ug/L			0.185	U
Cadmium	ug/L			0.531	U
Calcium	ug/L			7300	=
Chromium, Total	ug/L			1.36	J
Cobalt	ug/L			0.581	U
Copper	ug/L			17.4	J
Iron	ug/L			272	=
Lead	ug/L			2.42	J
Magnesium	ug/L			248	J
Manganese	ug/L			6.77	J
Nickel	ug/L			0.837	U
Potassium	ug/L			1510	J
Selenium	ug/L			2.67	U
Silver	ug/L			1.15	U
Sodium	ug/L			1670	J
Thallium	ug/L			4.99	U
Vanadium	ug/L			4.54	J
Zinc	ug/L			52.5	=
Mercury	ug/L	0.04	U		

PCBs, Groundwater and OWS Water
AOC 713

	StationID	F713GP001		F713GP002		F713GP003		F713ZAOS1	
	SampleID	713GP001M1		713GP002M1		713GP003M1		713ZAOS1M1	
	DateCollected	6/11/2002		6/11/2002		6/11/2002		6/7/2002	
	DateExtracted	6/14/2002		6/14/2002		6/13/2002		6/10/2002	
	DateAnalyzed	6/20/2002		6/20/2002		6/19/2002		6/11/2002	
	SDGNumber	61967		61967		61967		61738	
Parameter	**Units**								
PCB-1016 (Arochlor 1016)	ug/L	0.98	U	0.98	U	0.96	U	1	U
PCB-1221 (Arochlor 1221)	ug/L	0.98	U	0.98	U	0.96	U	1	U
PCB-1232 (Arochlor 1232)	ug/L	0.98	U	0.98	U	0.96	U	1	U
PCB-1242 (Arochlor 1242)	ug/L	0.98	U	0.98	U	0.96	U	1	U
PCB-1248 (Arochlor 1248)	ug/L	0.98	U	0.98	U	0.96	U	1	U
PCB-1254 (Arochlor 1254)	ug/L	2	U	2	U	1.9	U	2	U
PCB-1260 (Arochlor 1260)	ug/L	2	U	2	U	1.9	U	2	U

Pesticides, Groundwater and OWS Water
AOC 713

	StationID	F713GP001		F713GP002		F713GP003		F713ZAOS1	
	SampleID	713GP001M1		713GP002M1		713GP003M1		713ZAOS1M1	
	DateCollected	6/11/2002		6/11/2002		6/11/2002		6/7/2002	
	DateExtracted	6/13/2002		6/13/2002		6/13/2002		6/11/2002	
	DateAnalyzed	6/20/2002		6/17/2002		6/17/2002		6/13/2002	
	SDGNumber	61967		61967		61967		61738	
Parameter	**Units**								
Aldrin	ug/L	0.042	U	0.04	U	0.038	U	0.04	UJ
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/L	0.042	U	0.04	U	0.038	U	0.04	UJ
Alpha-chlordane	ug/L	0.042	U	0.04	U	0.038	U	0.04	UJ
Beta BHC (Beta Hexachlorocyclohexane)	ug/L	0.042	U	0.04	UJ	0.038	UJ	0.04	UJ
Chlordane	ug/L	0.42	U	0.4	U	0.38	U	0.4	UJ
Delta BHC (Delta Hexachlorocyclohexane)	ug/L	0.042	U	0.04	UJ	0.038	UJ	0.04	UJ
Dieldrin	ug/L	0.084	UJ	0.08	U	0.077	U	0.079	UJ
Endosulfan I	ug/L	0.042	U	0.04	U	0.038	U	0.04	UJ
Endosulfan II	ug/L	0.084	U	0.08	U	0.077	U	0.079	UJ
Endosulfan Sulfate	ug/L	0.084	U	0.08	U	0.077	U	0.079	UJ
Endrin Aldehyde	ug/L	0.084	U	0.08	U	0.077	U	0.079	UJ
Endrin Ketone	ug/L	0.084	U	0.08	U	0.077	U	0.079	UJ
Endrin	ug/L	0.084	UJ	0.08	U	0.077	U	0.079	UJ
Gamma BHC (Lindane)	ug/L	0.042	U	0.04	U	0.038	U	0.04	UJ
Gamma-chlordane	ug/L	0.042	U	0.04	U	0.038	U	0.04	UJ
Heptachlor Epoxide	ug/L	0.042	U	0.04	U	0.038	U	0.04	UJ
Heptachlor	ug/L	0.042	U	0.04	U	0.038	U	0.04	UJ
Methoxychlor	ug/L	0.4	UJ	0.38	U	0.36	U	0.38	UJ
p,p'-DDD	ug/L	0.084	U	0.08	U	0.077	U	0.079	UJ
p,p'-DDE	ug/L	0.084	UJ	0.08	U	0.077	U	0.079	UJ
p,p'-DDT	ug/L	0.084	U	0.08	U	0.077	U	0.079	UJ
Toxaphene	ug/L	2.6	U	2.5	U	2.4	U	2.5	UJ

SVOCs, Groundwater and OWS Water
AOC 713

	StationID	F713GP001		F713GP002		F713GP003		F713ZAOS1	
	SampleID	713GP001M1		713GP002M1		713GP003M1		713ZAOS1M1	
	DateCollected	6/11/2002		6/11/2002		6/11/2002		6/7/2002	
	DateExtracted	6/13/2002		6/13/2002		6/13/2002		6/11/2002	
	DateAnalyzed	6/21/2002		6/21/2002		6/21/2002		6/13/2002	
	SDGNumber	61967		61967		61967		61738	
Parameter	**Units**								
Phenol	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2-Chlorophenol	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
1,3-Dichlorobenzene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
1,4-Dichlorobenzene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Benzyl alcohol	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
1,2-Dichlorobenzene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Bis(2-Chloroisopropyl)Ether	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2-Methylphenol (o-Cresol)	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
N-Nitrosodi-n-propylamine	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Hexachloroethane	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Nitrobenzene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Isophorone	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2-Nitrophenol	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2,4-Dimethylphenol	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
bis(2-Chloroethoxy) Methane	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2,4-Dichlorophenol	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Benzoic acid	ug/L	51	U	49.3	U	49	U	48.5	U
1,2,4-Trichlorobenzene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Naphthalene	ug/L	0.74	J	9.8	U	9.8	U	9.7	U
4-Chloroaniline	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Hexachlorobutadiene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
4-Chloro-3-methylphenol	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2-Methylnaphthalene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Hexachlorocyclopentadiene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2,4,6-Trichlorophenol	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2,4,5-Trichlorophenol	ug/L	51	U	49.3	U	49	U	48.5	U
2-Chloronaphthalene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2-Nitroaniline	ug/L	51	U	49.3	U	49	U	48.5	U

SVOCs, Groundwater and OWS Water
AOC 713

	StationID	F713GP001		F713GP002		F713GP003		F713ZAOS1	
	SampleID	713GP001M1		713GP002M1		713GP003M1		713ZAOS1M1	
	DateCollected	6/11/2002		6/11/2002		6/11/2002		6/7/2002	
	DateExtracted	6/13/2002		6/13/2002		6/13/2002		6/11/2002	
	DateAnalyzed	6/21/2002		6/21/2002		6/21/2002		6/13/2002	
	SDGNumber	61967		61967		61967		61738	
Parameter	**Units**								
3-Nitroaniline	ug/L	51	U	49.3	U	49	U	48.5	U
Dimethyl Phthalate	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2,6-Dinitrotoluene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Acenaphthylene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Acenaphthene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2,4-Dinitrophenol	ug/L	51	U	49.3	U	49	U	48.5	U
Dibenzofuran	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
2,4-Dinitrotoluene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Diethyl Phthalate	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
4-Nitrophenol	ug/L	51	U	49.3	U	49	U	48.5	U
Fluorene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
4-Chlorophenyl Phenyl Ether	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
4,6-Dinitro-2-methylphenol	ug/L	51	U	49.3	U	49	U	48.5	U
4-Nitroaniline	ug/L	51	U	49.3	U	49	U	48.5	U
Diphenylamine	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
4-Bromophenyl Phenyl Ether	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Hexachlorobenzene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Pentachlorophenol	ug/L	51	U	49.3	U	49	U	48.5	U
Phenanthrene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Anthracene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Di-n-butyl Phthalate	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Fluoranthene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Pyrene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Benzyl Butyl Phthalate	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Benzo(a)Anthracene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
3,3'-Dichlorobenzidine	ug/L	20.4	UJ	19.7	UJ	19.6	UJ	19.4	UJ
Chrysene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
bis(2-Ethylhexyl) Phthalate	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Di-n-octylphthalate	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Benzo(b)Fluoranthene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U

SVOCs, Groundwater and OWS Water
AOC 713

	StationID	F713GP001		F713GP002		F713GP003		F713ZAOS1	
	SampleID	713GP001M1		713GP002M1		713GP003M1		713ZAOS1M1	
	DateCollected	6/11/2002		6/11/2002		6/11/2002		6/7/2002	
	DateExtracted	6/13/2002		6/13/2002		6/13/2002		6/11/2002	
	DateAnalyzed	6/21/2002		6/21/2002		6/21/2002		6/13/2002	
	SDGNumber	61967		61967		61967		61738	
Parameter	**Units**								
Benzo(k)Fluoranthene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Benzo(a)Pyrene	ug/L	1	U	0.98	U	0.98	U	0.97	U
Indeno(1,2,3-c,d)pyrene	ug/L	10.2	UJ	9.8	UJ	9.8	UJ	9.7	U
Dibenz(a,h)anthracene	ug/L	10.2	UJ	9.8	UJ	9.8	UJ	9.7	U
Benzo(g,h,i)Perylene	ug/L	10.2	U	9.8	U	9.8	U	9.7	U
Carbazole	ug/L	10.2	U	9.8	U	9.8	U	9.7	U

VOCs, Groundwater and OWS Water
AOC 713

	StationID	F713GP001		F713GP002		F713GP003		F713ZAOS1	
	SampleID	713GP001M1		713GP002M1		713GP003M1		713ZAOS1M1	
	DateCollected	6/11/2002		6/11/2002		6/11/2002		6/7/2002	
	DateExtracted	6/22/2002		6/22/2002		6/22/2002		6/12/2002	
	DateAnalyzed	6/22/2002		6/22/2002		6/22/2002		6/12/2002	
	SDGNumber	61967		61967		61967		61738	
Parameter	**Units**								
Chloromethane	ug/L	10	U	10	U	10	U	10	U
Vinyl chloride	ug/L	10	U	10	U	10	U	10	U
Bromomethane	ug/L	10	U	10	U	10	U	10	U
Chloroethane	ug/L	10	U	10	U	10	U	10	U
1,1-Dichloroethene	ug/L	5	U	5	U	5	U	5	U
Acetone	ug/L	10	U	10	U	10	U	10	U
Carbon Disulfide	ug/L	5	U	5	U	5	U	5	U
Methylene Chloride	ug/L	5	U	5	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U	5	U	5	U
Vinyl acetate	ug/L	10	UJ	10	UJ	10	UJ	10	U
Methyl ethyl ketone (2-Butanone)	ug/L	10	U	10	U	10	U	10	U
cis-1,2-Dichloroethylene	ug/L	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)	ug/L	5	U	5	U	5	U	5	U
Chloroform	ug/L	5	U	5	U	5	U	5	U
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U	5	U
Carbon Tetrachloride	ug/L	5	U	5	U	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U	5	U	5	U
Benzene	ug/L	5	U	5	U	5	U	5	U
Trichloroethylene (TCE)	ug/L	5	U	5	U	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U	5	U	5	U
2-Chloroethyl vinyl ether	ug/L	5	R	5	U	5	U	5	UJ
cis-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/L	10	U	10	U	10	U	10	U
Toluene	ug/L	5	U	5	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	5	U	5	U
2-Hexanone	ug/L	10	U	10	U	10	U	10	U
Tetrachloroethylene (PCE)	ug/L	5	U	5	U	5	U	5	U

VOCs, Groundwater and OWS Water
AOC 713

	StationID	F713GP001		F713GP002		F713GP003		F713ZAOS1	
	SampleID	713GP001M1		713GP002M1		713GP003M1		713ZAOS1M1	
	DateCollected	6/11/2002		6/11/2002		6/11/2002		6/7/2002	
	DateExtracted	6/22/2002		6/22/2002		6/22/2002		6/12/2002	
	DateAnalyzed	6/22/2002		6/22/2002		6/22/2002		6/12/2002	
	SDGNumber	61967		61967		61967		61738	
Parameter	**Units**								
Dibromochloromethane	ug/L	5	U	5	U	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U	5	U	5	U
m+p Xylene	ug/L	5	U	5	U	5	U	5	U
o-Xylene	ug/L	5	U	5	U	5	U	5	U
Xylenes, Total	ug/L	5	U	5	U	5	U	5	U
Styrene	ug/L	5	U	5	U	5	U	5	U
Bromoform	ug/L	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	5	U	5	U
1,3-Dichlorobenzene	ug/L	5	U	5	U	5	U	5	U
1,4-Dichlorobenzene	ug/L	5	U	5	U	5	U	5	U
1,2-Dichlorobenzene	ug/L	5	U	5	U	5	U	5	U
1,2,4-Trichlorobenzene	ug/L	5	U	5	U	5	U	5	U
1,2,3-Trichlorobenzene	ug/L	5	U	5	U	5	U	5	U

Appendix D

Data Validation Summary - Charleston Naval Complex - Zone E, AOC 716 and Zone F, AOC 713

TO: Louise Palmer/CH2M HILL/CLT

FROM: Amy Juchem/CH2M HILL/GNA
Herb Kelly/CH2M HILL/GNA

DATE: August 30, 2002

The purpose of this memorandum is to present the results of the data validation process for the samples collected in Zone E, AOC 716 and Zone F, AOC 713. The samples were collected between the dates of May 2, 2002 and July 11, 2002.

The specific samples and analytical fractions reviewed are summarized below in Table 1.

The Quality Control areas that were reviewed and the resulting findings are documented within each subsection that follows. This data was validated for compliance with the analytical method requirements. This process also included a review of the data to assess the accuracy, precision, and completeness based upon procedures described in the guidance documents such as the Environmental Protection Agency (EPA) *National Functional Guidelines for Inorganic Data Review (EPA 1994) and National Functional Guidelines for Organic Data Review (EPA 1999)* Quality assurance/quality control (QA/QC) summary forms and data reports were reviewed

Samples were submitted to General Engineering Laboratories, Inc., in Charleston, South Carolina, for the following analyses: SW-846 8260 Volatile Organic Compounds (VOC), SW-846 8270 Semivolatile Organic Compounds (SVOC), SW-846 8081 Organochlorine Pesticides, SW-846 8082 Polychlorinated Biphenyls, and Metals following SW-846 6010/7000 Series methodology

Sample results that were not within the acceptance limits were appended with a qualifying flag, which consisted of a single- or double-letter code that indicated a possible problem with the data. The qualifying flags originated during the data review and validation processes. These also include the secondary, or the two-digit "sub-qualifier" flags. The secondary qualifiers provide the reasoning behind the assignment of a qualifier flag to the data. The secondary qualifiers are presented and defined below.

Attachment 1 lists the changes in data qualifiers, due to the validation process.

The following primary flags were used to qualify the data:

[=] Detected. The analyte was analyzed for and detected at the concentration shown.

[J] Estimated. The analyte was present but the reported value may not be accurate or precise.

[U] Undetected. The analyte was analyzed for but not detected above the method detection limit.

[UJ] Detection limit estimated. The analyte was analyzed for but qualified as not detected; the result is estimated.

[R] Rejected. The data is not useable.

Secondary Data Validation Qualifiers

Code	Definition
2S	Second Source
BL	Blank
BD	Blank Spike/Blank Spike Duplicate or (LCS/LCSD) Precision
BS	Blank Spike/LCS
CC	Continuing Calibration Verification
DL	Dilution
FD	Field Duplicate
HT	Holding Time
IB	In-Between (metals - B's → J's)
IC	Initial Calibration
IS	Internal Standard
LD	Lab Duplicate
LR	Concentration exceeded Linear Range
MD	MS/MSD or LCS/LCSD Precision
MS	Matrix Spike/Matrix Spike Duplicate
OT	Other (see DV worksheet)
PD	Pesticide Degradation
PS	Post Spike
RE	Re-extraction/Re-analysis
SD	Serial Dilution
SS	Spiked Surrogate
TN	Tune

Table 1 - Chemical Analytical Methods – Field and Quality Control Samples

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LR Type	Upper Depth	Lower Depth	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8081A	PCBs SW8082	Metals SW6010B	Mercury SW7470A / SW7471A
61559	E716VAOS1	716VAOS1M1	61559001	SO	N				06/05/02		X	X	X	X	X
61559	E716VAOS1	716VAOS1M1MS	1200229786	SO	MS				06/05/02						X
61559	E716VAOS1	716VAOS1M1SD	1200229787	SO	SD				06/05/02						X
61559	E716VAOS1	716VAOS1M1MS	1200230351	SO	MS				06/05/02		X				
61559	E716VAOS1	716VAOS1M1SD	1200230352	SO	SD				06/05/02		X				
61559	E716VAOS1	716VAOS1M1MS	1200234648	SO	MS				06/05/02					X	
61559	E716VAOS1	716VAOS1M1SD	1200234649	SO	SD				06/05/02					X	
61559	LABQC	1200229303	1200229303	SQ	LB								X		
61559	LABQC	1200229304	1200229304	SQ	BS								X		
61559	LABQC	1200229785	1200229785	SQ	LB										X
61559	LABQC	1200229788	1200229788	SQ	BS										X
61559	LABQC	1200229978	1200229978	SQ	LB							X			
61559	LABQC	1200229979	1200229979	SQ	BS							X			
61559	LABQC	1200230349	1200230349	SQ	LB						X				
61559	LABQC	1200230350	1200230350	SQ	BS						X				
61559	LABQC	1200234646	1200234646	SQ	LB									X	
61559	LABQC	1200234650	1200234650	SQ	BS									X	
61560	E716ZAOS1	716ZAOS1M1	61560001	WG	N				06/05/02	X	X	X	X	X	X
61560	E716ZAOS1	716ZAOS1M1MS	1200229867	WG	MS				06/05/02	X					
61560	E716ZAOS1	716ZAOS1M1SD	1200229868	WG	SD				06/05/02	X					

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LR Type	Upper Depth	Lower Depth	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8081A	PCBs SW8082	Metals SW6010B	Mercury SW7470A / SW7471A
61560	E716ZAOS1	716ZAOS1M1MS	1200230249	WG	MS				06/05/02		X				
61560	E716ZAOS1	716ZAOS1M1SD	1200230250	WG	SD				06/05/02		X				
61560	F716ZAOS1	716ZAOS1M1MS	1200234183	WG	MS				06/05/02						X
61560	E716ZAOS1	716ZAOS1M1SD	1200234184	WG	SD				06/05/02						X
61560	E716ZAOS1	716ZAOS1M1MS	1200234654	WG	MS				06/05/02					X	
61560	E716ZAOS1	716ZAOS1M1SD	1200234655	WG	SD				06/05/02					X	
61560	LABQC	1200229973	1200229973	WQ	LB							X			
61560	LABQC	1200229974	1200229974	WQ	BS							X			
61560	LABQC	1200230068	1200230068	WQ	LB					X					
61560	LABQC	1200230069	1200230069	WQ	BS					X					
61560	LABQC	1200230203	1200230203	WQ	LB								X		
61560	LABQC	1200230204	1200230204	WQ	BS								X		
61560	LABQC	1200230247	1200230247	WQ	LB						X				
61560	LABQC	1200230248	1200230248	WQ	BS						X				
61560	LABQC	1200234182	1200234182	WQ	LB										X
61560	LABQC	1200234185	1200234185	WQ	BS										X
61560	LABQC	1200234652	1200234652	WQ	LB									X	
61560	LABQC	1200234656	1200234656	WQ	BS									X	
61738	F713ZAOS1	713ZAOS1M1	61738001	WG	N				06/07/02	X	X	X	X	X	X
61738	FIELDQC	713EB001M1	61738002	WQ	EB				06/07/02	X	X	X	X	X	X
61738	FIELDQC	713TB001M1	61738003	WQ	TB				06/07/02	X					
61738	LABQC	1200231998	1200231998	WQ	LB								X		

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LR Type	Upper Depth	Lower Depth	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8081A	PCBs SW8082	Metals SW6010B	Mercury SW7470A / SW7471A
61738	LABQC	1200231999	1200231999	WQ	BS								X		
61738	LABQC	1200232065	1200232065	WQ	LB						X				
61738	LABQC	1200232066	1200232066	WQ	BS						X				
61738	LABQC	1200232113	1200232113	WQ	LB							X			
61738	LABQC	1200232114	1200232114	WQ	BS							X			
61738	LABQC	1200232662	1200232662	WQ	LB					X					
61738	LABQC	1200232663	1200232663	WQ	BS					X					
61738	LABQC	1200234057	1200234057	WQ	LB					X					
61738	LABQC	1200234058	1200234058	WQ	BS					X					
61738	LABQC	1200234222	1200234222	WQ	LB										X
61738	LABQC	1200234225	1200234225	WQ	BS										X
61738	LABQC	1200234652	1200234652	WQ	LB									X	
61738	LABQC	1200234656	1200234656	WQ	BS									X	
61741	F713SB001	713SB00102	61741001	SO	N		3	5	06/07/02		X	X	X	X	X
61741	F713SB002	713SB00202	61741002	SO	N		3	5	06/07/02		X	X	X	X	X
61741	F713SB003	713SB00302	61741003	SO	N		3	5	06/07/02		X	X	X	X	X
61741	F713SB003	713SB00302RE	61741003	SO	LR	RE	3	5	06/07/02				X		
61741	F713VAOS1	713VAOS1M1	61741004	SO	N				06/07/02		X	X	X	X	X
61741	LABQC	1200232015	1200232015	SQ	LB								X		
61741	LABQC	1200232016	1200232016	SQ	BS								X		
61741	LABQC	1200232080	1200232080	SQ	LB						X				
61741	LABQC	1200232081	1200232081	SQ	BS						X				

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LR Type	Upper Depth	Lower Depth	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8081A	PCBs SW8082	Metals SW6010B	Mercury SW7470A / SW7471A
61741	LABQC	1200232122	1200232122	SQ	LB							X			
61741	LABQC	1200232123	1200232123	SQ	BS							X			
61741	LABQC	1200234646	1200234646	SQ	LB									X	
61741	LABQC	1200234650	1200234650	SQ	BS									X	
61741	LABQC	1200241445	1200241445	SQ	LB							X			
61741	LABQC	1200241446	1200241446	SQ	BS							X			
61741	LABQC	1200242616	1200242616	SQ	LB										X
61741	LABQC	1200255856	1200255856	SQ	LB								X		
61741	LABQC	1200255857	1200255857	SQ	BS								X		
61967	F713GP001	713GP001M1	61967001	WG	N				06/11/02	X	X	X	X		
61967	F713GP001	713GP001M1MS	1200242600	WG	MS				06/11/02	X					
61967	F713GP001	713GP001M1SD	1200242601	WG	SD				06/11/02	X					
61967	F713GP002	713GP002M1	61967002	WG	N				06/11/02	X	X	X	X		
61967	F713GP003	713GP003M1	61967003	WG	N				06/11/02	X	X	X	X		
61967	F713GP003	713GP003M1MS	1200234552	WG	MS				06/11/02			X			
61967	F713GP003	713GP003M1SD	1200234553	WG	SD				06/11/02			X			
61967	FIELDQC	713EP001M1	61967004	WQ	EB				06/11/02	X	X	X	X		
61967	FIELDQC	713TP001M1	61967005	WQ	TB				05/02/02	X					
61967	LABQC	1200234550	1200234550	WQ	LB							X			
61967	LABQC	1200234551	1200234551	WQ	BS							X			
61967	LABQC	1200235780	1200235780	WQ	LB								X		
61967	LABQC	1200235781	1200235781	WQ	BS								X		

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LR Type	Upper Depth	Lower Depth	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8081A	PCBs SW8082	Metals SW6010B	Mercury SW7470A / SW7471A
61967	LABQC	1200242596	1200242596	WQ	LB					X					
61967	LABQC	1200242597	1200242597	WQ	LB					X					
61967	LABQC	1200242598	1200242598	WQ	BS					X					
61967	LABQC	1200242599	1200242599	WQ	BS					X					
63281	F713VA0S1	713VA0S1M3	63281003	SO	N				07/09/02	X					
63281	E716VA0S1	716VA0S1M3	63281004	SO	N				07/09/02	X					
63281	LABQC	1200261034	1200261034	SQ	LB					X					
63281	LABQC	1200261039	1200261039	SQ	BS					X					
63281	LABQC	1200261040	1200261040	SQ	BD					X					
63281	LABQC	1200262432	1200262432	SQ	LB					X					
63282	FIELDQC	712EB001M3**	63282001	WQ	EB				07/09/02	X					
63282	FIELDQC	712TB001M3**	63282002	WQ	TB				07/09/02	X					
63282	LABQC	1200262476	1200262476	WQ	LB					X					
63282	LABQC	1200262479	1200262479	WQ	BS					X					
63437	F713SB004	713SB00403	63437004	SO	N		3	5	07/11/02	X					
63437	F713SB005	713SB00503	63437005	SO	N		3	5	07/11/02	X					
63437	F713SB006	713SB00603	63437006	SO	N		3	5	07/11/02	X					
63437	LABQC	1200262480	1200262480	SQ	LB					X					
63437	LABQC	1200262483	1200262483	SQ	BS					X					
63438	FIELDQC	712EB002M3**	63438001	WQ	EB				07/11/02	X					
63438	LABQC	1200263478	1200263478	WQ	LB					X					
63438	LABQC	1200263480	1200263480	WQ	BS					X					

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LR Type	Upper Depth	Lower Depth	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8081A	PCBs SW8082	Metals SW6010B	Mercury SW7470A / SW7471A
64902	FIELDQC	037TW001M2	64902001	WQ	TB				08/05/02	X					
64902	FIELDQC	037EW001M2	64902002	WQ	EB				08/05/02	X	X	X	X	X	X
64902	A037GW001	037GW001M2	64902003	WG	N				08/05/02	X	X	X	X	X	X
64902	LABQC	1200279454	1200279454	WQ	LB							X			
64902	LABQC	1200279455	1200279455	WQ	BS							X			
64902	LABQC	1200279609	1200279609	WQ	LB								X		
64902	LABQC	1200279610	1200279610	WQ	BS								X		
64902	LABQC	1200279635	1200279635	WQ	LB						X				
64902	LABQC	1200279636	1200279636	WQ	BS						X				
64902	LABQC	1200279726	1200279726	WQ	LB										X
64902	LABQC	1200279730	1200279730	WQ	BS										X
64902	LABQC	1200279914	1200279914	WQ	LB					X					
64902	LABQC	1200279919	1200279919	WQ	BS					X					
64902	LABQC	1200280184	1200280184	WQ	LB									X	
64902	LABQC	1200280188	1200280188	WQ	BS									X	
64902	LABQC	1200280494	1200280494	WQ	LB					X					
64902	LABQC	1200280495	1200280495	WQ	BS					X					

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LR Type	Upper Depth	Lower Depth	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8081A	PCBs SW8082	Metals SW6010B	Mercury SW7470A / SW7471A

** These samples are not a part of the AOCs addressed in this report. They have been included in this table because they are field blanks associated with samples in this report.

MATRIX CODE

WG – Groundwater
WQ – Water QC Sample
SO - Soil
SQ – Soil QC Sample

SAMPLE TYPE CODE

BS - Blank Spike
EB - Equipment Blank
TB - Trip Blank
N - Native Sample
FD – Field Duplicate
LB - Laboratory Blank
LR – Laboratory Replicate
MS - Matrix Spike
SD – Matrix Spike Duplicate

LR TYPE CODE

RE - Reanalysis

ANALYSIS CODE

VOC - Volatile Organic Compounds
SVOC - Semivolatile Organic Compounds
PCBs – Polychlorinated Biphenyls

Organic Parameters

Quality Control Review

The following list represents the QA/QC measures that were reviewed during the data quality evaluation procedure for organic data.

- **Holding Times** – The holding times are evaluated to verify that samples were extracted and analyzed within holding times.
- **Blank samples** – Method blanks, equipment blanks, and trip blanks were provided for this project. Blank samples enable the reviewer to determine if an analyte may be attributed to sampling or laboratory procedures, rather than environmental contamination from site activities.
- **Surrogate Recoveries** – Surrogate Compounds are added to each sample and the recoveries are used to monitor lab performance and possible matrix interference.
- **Lab Control Sample (LCS)** – This sample is a "controlled matrix", either laboratory reagent water or Ottawa sand, in which target compounds have been added prior to extraction/analysis. The recoveries serve as a monitor of the overall performance of each step during the analysis, including sample preparation.
- **Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples** – Spike recovery is used to evaluate potential matrix interferences, as well as accuracy. Precision information is also determined by calculating the reproducibility between the recoveries of each spiked parameter.
- **Field Duplicate Samples** – These samples are collected to determine precision between a native and its duplicate. This information can only be determined when target compounds are detected.
- **GC/MS Tuning** – The mass spectrum of the tuning compound is evaluated for method compliance. The criteria are established to verify the proper mass assignment and mass resolution.
- **Initial Calibration** – The initial calibration ensures that the instrument is capable of producing acceptable qualitative and quantitative data for the compounds of interest.
- **Continuing Calibration** – The continuing calibration checks satisfactory performance of the instrument and its predicted response to the target compounds.
- **Pesticide Degradation** – Degradation checks on the gas chromatograph with electron capture detector system are performed to ensure minimal instrument breakdown of target compounds. These criteria are not sample specific.
- **Confirmation** – If GCMS methodology is not initially used for analysis, SW-846 method 8000 requires confirmation when the composition of samples is not well characterized. Therefore, even when the identification has been confirmed on a dissimilar column or detector, the agreement of the quantitative results on both columns is evaluated. For Pesticide and PCB analyses covered in this report, confirmation was performed using a

dissimilar analytical column. The laboratory analyzed samples with a gas chromatograph (GC) utilizing simultaneous primary and confirmation data acquisition. Per SW-86 method 8000, 40% RPD criteria was used as the acceptance limit.

- **Internal Standards** The internal standards (retention time and response) are evaluated for method compliance. The internal standards are used in quantitation of the target parameters and monitor the instrument sensitivity and response for stability during each analysis.

Volatile Organic Compounds (VOC) Analyses

The QA/QC parameters for VOC analyses for all of the samples were within acceptable control limits, except as noted below:

There were selected samples that had to be recollected and reanalyzed for the analysis of the Volatile Organic Compounds. All of the samples were originally collected following proper procedures, and for each sample, both EnCore samplers and a glass container were submitted to the laboratory. The glass container was to be used for screening proposes. However, the aliquots for analysis were taken from the glass container instead of from the EnCore samplers. Therefore the decision was made to recollect and reanalyze the samples following all proper protocol. The results from the first analysis were supplied to the Project Team, but were qualified in the database with an "S" qualifier, to be used as screening data only. The text in this report discusses the results from the samples that were recollected and reanalyzed. The "screening data" is also included, but is not considered adequate for the decision-making process.

The original sample ID numbers and the IDs of the recollected samples are compared in Table 2 below.

TABLE 2
Screening Samples vs Recollected Samples Cross Reference: VOCs
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

Original Sample		Recollected Sample	
Lab Sample ID	Sample ID	Lab Sample ID	Sample ID
61559001	716VAOS1M1	63281004	716VA0S1M3
61741001	713SB00102	63437004	713SB00403
61741002	713SB00202	63437005	713SB00503
61741003	713SB00302	63437006	713SB00603
61741004	713VAOS1M1	63281003	713VA0S1M3

Blanks

The VOC target parameters detected in blank samples are listed in Table 3.

TABLE 3
Blank Contamination: VOCs
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Flag Concentrations less than the value listed below
61560	1200230068	1200230068	LB	Acetone	5.5	µg/L	55.0 µg/L
61738	713EB001M1	61738002	EB	Acetone	7.6	µg/L	76.0 µg/L
61738	713TB001M1	61738003	TB	Acetone	7.3	µg/L	73.0 µg/L
61967	713EP001M1	61967004	EB	Toluene	1.9	µg/L	9.5 µg/L
61967	713EP001M1	61967004	EB	1,4-Dichlorobenzene	0.29	µg/L	1.5 µg/L
61967	713TP001M1	61967005	TB	1,1-Dichloroethylene	2.6	µg/L	13.0 µg/L
63281	1200261034	1200261034	LB	Toluene	43.7	µg/Kg	218.5 µg/Kg
63281	712EB001M3	63282001	EB	Toluene	0.46	µg/L	2.3 µg/Kg
63281	712EB001M3	63282001	EB	Acetone	2.8	µg/L	28.0 µg/Kg
63281	712TB001M3	63282002	TB	Toluene	0.5	µg/L	2.5 µg/Kg
63281	712TB001M3	63282002	TB	Acetone	2.4	µg/L	24.0 µg/Kg
63437	712EB002M3	63438001	EB	Acetone	20.7	µg/L	207.0 µg/Kg
63437	712EB002M3	63438001	EB	2-Butanone	2.7	µg/L	27.0 µg/Kg
64902	1200279914	1200279914	LB	1,4-Dichlorobenzene	0.25	µg/L	1.5 µg/L
64902	037EW001M2	64902002	EB	1,4-Dichlorobenzene	0.36	µg/L	1.8 µg/L
64902	037TW001M2	64902001	TB	1,4-Dichlorobenzene	0.57	µg/L	2.9 µg/L

If a target parameter determined to be a common contaminant was reported in a field sample, and the concentration was below the level determined to be due to blank contamination, the following actions were taken:

- If the concentration was above the reporting limit, the numeric result was unchanged, but it was flagged "U", as undetected.
- If the concentration was below the reporting limit, the numeric result was changed to the value of the reporting limit, and it was flagged "U", as undetected.

The results qualified due to blank contamination are listed in Attachment 1.

Recoveries - Surrogate, MS/MSD and LCS/LCSD

All Surrogate, Matrix Spike (MS), Matrix Spike Duplicate (MSD), Laboratory Control Sample (LCS) and Laboratory Control Duplicate Sample (LCSD) recoveries and Relative Percent Deviations (RPDs) were within acceptable quality control limits, except as noted in Table 4 below.

TABLE 4
Surrogate, MS/MSD, and LCS/LCSD Recoveries and RPDs Out of QC Limits: VOC
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample	Parameter	Recovery	Recovery Limits	Associated Samples	Flag
61560	716ZAOS1M1 MS/MSD	2-Chloroethyl vinyl ether	0* / 0*	70-130	61560001	Detects-J, non-detects-R
		1,3-Dichlorobenzene	66.6* / 67.0*	70-130	61560001	Detects-J, non-detects-UJ
		1,2,4-Trichlorobenzne	64.0* / 64.6*	70-130		
61967	713GP001M1 MS/MSD	2-Chloroethyl vinyl ether	0* / 0*	70-130	61967001	Detects-J, non-detects-R
61967	1200242598 LCS	Vinyl acetate	49.2*	70-130	61967 - All	Detects-J, non-detects-UJ
63281	1200261039 LCS/ 1200261040 LCSD	Vinyl acetate	68.8* / 68.8*	70-130	63281 – All	Detects-J, non-detects-UJ
63437	1200626483 LCS	Vinyl acetate	64*	70-130	63437 - All	Detects-J, non-detects-UJ
64902	1200279919 LCS	Vinyl acetate	62.8*	70-130	64902001, 64902002	Detects-J, non-detects-UJ
64902	1200280495 LCS	Vinyl acetate	64.0*	70-130	64902003	Detects-J, non-detects-UJ

* - out of control limits

Initial and Continuing Calibration Criteria

All initial calibration criteria and continuing calibration criteria were met, except as listed in Table 5.

TABLE 5
Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: VOC
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation or R^2 (ICAL)/ %Difference (CCAL)	Associated Samples
VOA2-CCAL-06/10/02, 1906	1,2,3-Trichlorobenzen	20.5% high	61560001
VOA1-CCAL-06/12/02, 0806	2-Chloroethyl vinyl ether	30.2% low	61738 - All
	Dibromochloromethane	23.3% high	
	Styrene	21.5% high	
	1,2,4-Trimethylbenzene	20.2% high	
VOA9-CCAL-06/22/02, 0820	Vinyl acetate	50.8% low	61967 - All
VOA1-ICAL-06/19/02, 2308	2-Chloroethyl vinyl ether	RRF=0.043	63281 – All 63437 – All
VOA1-CCAL-07/12/02, 0816	Acetone	RRF=0.049	63281 – All
	Bromomethane	29.8% high	
	Vinyl acetate	31.3% low	
	2-Chloroethyl vinyl ether	RRF=0.040	
VOA1-CCAL-07/15/02, 0810	Acetone	RRF=0.046	63437 - All
	Chloromethane	20.9% low	
	Methylene chloride	21.4% high	
	Vinyl acetate	35.9% low	
	2-Chloroethyl vinyl ether	RRF=0.035	
	1,2,3-Trichlorobenzene	23.5% high	
VOA1-CCAL-08/08/02, 0834	Vinyl acetate	37.3% low	64902001, 64902002
	2-Chloroethyl vinyl ether	RRF=0.043	
VOA1-CCAL-08/09/02, 0815	Vinyl acetate	36.0% low	64902003
	2-Chloroethyl vinyl ether	RRF=0.042	

Flags were applied to the compounds in the associated samples in the following manner:

- When the Average Relative Response Factor (RRF) was low in the initial calibration, detected compounds were flagged "J", and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference (%D) was low in the continuing calibration standards, detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference (%D) was high in the continuing calibration standards, detected compounds were flagged "J", as estimated. Non-detected compounds were not flagged.
- When the Relative Response Factor (RRF) was low in the continuing calibration, detected compounds were flagged "J", and non-detected compounds were flagged "UJ", as estimated.

Internal Standard Area

All internal standard areas were within QC limits, except as noted in Table 6 below.

TABLE 6
Internal Standard Area out of Criteria: VOC
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample	Internal Standards	Flags applied to compounds associated with IS out
63437	63437006	1,4-Dichlorobenzene – 54.9% low	Detects-J, non-detects-UJ
63737	63437012	1,4-Dichlorobenzene – 53.5% low	Detects-J, non-detects-UJ

Semivolatile Organic Compounds (SVOC) Analyses

The QA/QC parameters for the SVOC analyses for all of the samples were within acceptable control limits, except as noted below.

Blanks

The SVOC target parameters detected in blank samples are listed in Table 7.

TABLE 7
Blank Contamination: SVOCs
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Flag Concentrations less than the value listed below
61559	1200230349	1200230349	LB	bis(2-Ethylhexyl)phthalate	81.2	µg/Kg	812.0 µg/Kg
61738	713EB001M1	61738002	EB	bis(2-Ethylhexyl)phthalate	1.7	µg/L	17.0 µg/L
64902	1200279635	1200279635	LB	bis(2-Ethylhexyl)phthalate	1.5	µg/L	15.0 µg/L
64902	037EW001M2	64902002	EB	Di-n-butylphthalate	1.2	µg/L	12.0 µg/L

If a target parameter determined to be a common contaminant was reported in a field sample, and the concentration was below the level determined to be due to blank contamination, the following actions were taken:

- If the concentration was above the reporting limit, the numeric result was unchanged, but it was flagged "U", as undetected.
- If the concentration was below the reporting limit, the numeric result was changed to the value of the reporting limit, and it was flagged "U", as undetected.

The results qualified due to blank contamination are listed in Attachment 1.

Recoveries - Surrogate, MS/MSD and LCS

All Surrogate, Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Laboratory Control Sample (LCS) recoveries and Relative Percent Deviations (RPDs) were within acceptable quality control limits, except as noted in Table 8 below.

TABLE 8
Surrogate, MS/MSD and LCS Recoveries and RPDs Out of QC Limits: SVOC
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample	Parameter	RPD	RPD Limits	Associated Samples	Flag
61559	716VAOS1M1 MS/MSD	Phenol	45*	35	61559001	Detects-J, non-detects-UJ
		1,4-Dichlorobenzene	111*	27		
		n-Nitrosodipropylamine	54*	38		
		1,2,4-Trichlorobenzene	99*	23		
		Acenaphthene	83*	19		
		Pyrene	86*	36		

* - out of control limits

Initial and Continuing Calibration Criteria

All initial calibration criteria and continuing calibration criteria were met, except as listed in Table 9.

TABLE 9
Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: SVOC
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation or R^2 (ICAL)/ %Difference (CCAL)	Associated Samples
MSD7-CCAL-06/08/02 1355	Benzoic acid	39.7% low RRF=0.046	61559001
	Hexachorocyclopentadiene	20.3% low	
	Indeno(1,2,3-cd)pyrene	33.9% low	
	Dibenzo(a,h)anthracene	34.5% low	
	Benzo(g,h,i)perylene	37.3% low	
MSD5-CCAL-06/07/02 1047	bis(2-Chloroethyl) ether	42.0% high	61560001
	2,4-Dinitrophenol	32.3% high	
	2-Methyl-4,6-dinitrophenol	32.9% high	
MSD5-CCAL-06/13/02 1137	bis(2-Chloroethyl) ether	35.8% high	61738001
	1,2-Dichlorobenzene	20.6% high	
	Nitrobenzene	20.3% high	
	Hexachlorocyclopentadiene	20.4% high	
	2,4-Dinitrophenol	36.8% high	
	2-Methyl-4,6-dinitrophenol	35.8% high	
	bis(2-Ethylhexyl)phthalate	24.0% high	
	m-Nitroaniline	44.9% low	
	3,3'-Dichlorobenzidine	24.1% low	
MSD2-CCAL-06/12/02, 1701	4-Nitrophenol	23.5% low	61741003, 61741004
	4-Chloroaniline	32.0% high	
MSD5-ICAL-06/20/02, 1727	Indeno(1,2,3-cd)pyrene	R^2 =0.986	61967 - All
	Dibenzo(a,h)anthracene	R^2 =0.987	
MSD5-CCAL-06/20/02 1806	o-Nitroaniline	23.7% high	61967 - All
	3,3'-Dichlorobenzidine	21.4% low	
MSD7-ICAL-07/29/02, 1921	Hexachloropentadiene	R^2 =0.983	64902 - All

TABLE 9
Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: SVOC
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation or R^2 (ICAL)/ %Difference (CCAL)	Associated Samples
MSD7-ICAL-07/29/02, 1921	2,4-Dinitrophenol	R^2 =0.982	64902 – All
MSD7-CCAL-08/09/02, 0853	bis(2-Chloroethyl) ether	36.2% high	64902 - All
	2,4-Dinitrophenol	22.9% low	
	o-Nitroaniline	32.2% high	

Flags were applied to the compounds in the associated samples in the following manner:

- When the percent Relative Standard Deviation (%RSD) or correlation coefficient (R^2) was out in the initial calibration, all associated samples were qualified. Detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference (%D) was high in the continuing calibration standards, detected compounds were flagged "J", as estimated. Non-detected compounds were not flagged.
- When the percent difference (%D) was low in the continuing calibration standards, detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the Relative Response Factor (RRF) was low in the continuing calibration, detected compounds were flagged "J", and non-detected compounds were flagged "UJ", as estimated.

Organochlorine Pesticide Analyses

The QA/QC parameters for the Organochlorine Pesticide analyses for all of the samples were within acceptable control limits, except as noted below:

Blanks

The Pesticide target parameters detected in blank samples are listed in Table 10.

TABLE 10
Blank Contamination: Pesticides
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Flag, Concentrations less than the value listed below
61967	713EP001M1	61967004	EB	4,4'-DDT	0.015	µg/L	0.08 µg/L
64902	037EW001M2	64902002	EB	4,4'-DDE	0.22	µg/L	01.1 µg/L
64902	037EW001M2	64902002	EB	4,4'-DDT	0.089	µg/L	0.45 µg/L

If a target parameter determined to be a common contaminant was reported in a field sample, and the concentration was below the level determined to be due to blank contamination, the following actions were taken:

- If the concentration was above the reporting limit, the numeric result was unchanged, but it was flagged "U", as undetected.
- If the concentration was below the reporting limit, the numeric result was changed to the value of the reporting limit, and it was flagged "U", as undetected.

The results qualified due to blank contamination are listed in Attachment 1.

Recoveries - Surrogate, MS/MSD and LCS

All Surrogate, Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Laboratory Control Sample (LCS) recoveries were within acceptable quality control limits, except as noted in Table 11 below.

TABLE 11
Surrogate, MS/MSD and LCS Recoveries Out of QC Limits: Pesticides
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample	Parameter	Recovery	Recovery Limits	Associated Samples	Flag
61559	61559001	4-cmx	33*	60-150	61559001	Detects only - J
		Decachlorobiphenyl	154*	60-150		
61738	61738001	4-cmx	44*	60-150	61738001	Detects-J, non-detects-UJ
		Decachlorobiphenyl	45*	60-150		
61738	1200232114 LCS	Heptachlor	52*	56-136	61738001	Detects-J, non-detects-UJ

* - out of control limits

Initial and Continuing Calibration Criteria

All initial calibration criteria and continuing calibration criteria were met, except as listed in Table 12.

TABLE 12
Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: Pesticides
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation or R^2 (ICAL)/ %Difference (CCAL)	Associated Samples
ECD1A-#1-CCAL-06/13/02, 1155	Heptachlor	17.0% high	61559001
	4,4'-DDT	32.0% high	
ECD1A-#1-CCAL-06/13/02, 1205	Toxaphene	19.5% high	61559001
ECD1A-#1-CCAL-06/13/02, 1216	Chlordane (tech)	24.0% high	61559001
ECD1A-#2-CCAL-06/13/02, 1216	Chlordane (tech)	25.0% high	61559001
ECD1A-#1-CCAL-06/13/02, 1552	alpha-BHC	18.0% high	61559001
	beta-BHC	16.0% high	
	delta-BHC	20.0% high	
	gamma-BHC	19.0% high	
	Heptachlor	23.0% high	
	4,4'-DDD	19.0% high	
	4,4'-DDT	30.0% high	
ECD1A-#2-CCAL-06/13/02, 1552	alpha-BHC	16.0% high	61559001
	beta-BHC	19.0% high	
	delta-BHC	18.0% high	
	gamma-BHC	20.0% high	
	Heptachlor	18.0% high	
	4,4'-DDD	25.0% high	
	Methoxychlor	23.0% high	
ECD7A-#1-CCAL-06/11/02, 1955	Chlordane	19.0% high	61560001
ECD7A-#2-CCAL-06/11/02, 1955	Chlordane	74.0% high	61560001

TABLE 12
Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: Pesticides
Charleston Naval Complex Zone E AOC 716 and Zone F, AOC 713, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation or R^2 (ICAL)/ %Difference (CCAL)	Associated Samples
ECD7-#1-ICAL-06/18/02 2128	Methoxychlor	R^2 =0.986	61967001
ECD2A-#1-CCAL-06/17/02, 1346	beta-BHC	16.2% low	61967002, 61967003, 61967004
	delta-BHC	15.7% low	
ECD2A-#1-CCAL-06/17/02, 1604	4,4'-DDT	25.5% high	61967002, 61967003, 61967004
ECD2A-#2-CCAL-06/17/02, 1604	delta-BHC	17.0% low	61967002, 61967003, 61967004
ECD7A-#1-CCAL-06/20/02, 1520	Endrin	16.0% low	61967001
ECD7A-#1-CCAL-06/20/02, 1610	Dieldrin	16.0% low	61967001
	4,4'-DDE	16.0% low	
	Endrin	17.5% low	
ECD5A-#1-CCAL-08/12/02, 1112	Endosulfan I	16.0% high	64902002, 64902003
ECD5A-#2-CCAL-08/12/02, 1112	Methoxychlor	24.2% low	64902002, 64902003
	Endrin ketone	16.5% low	
ECD5-#2-CCAL-08/12/02 1206	Chlordane (tech)	24.0% high	64902002, 64902003

Flags were applied to the compounds in the associated samples in the following manner:

- When the percent Relative Standard Deviation (%RSD) or correlation coefficient (R^2) was out in the initial calibration, all associated samples were qualified. Detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference (%D) was low in the continuing calibration standards, detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference (%D) was high in the continuing calibration standards, detected compounds were flagged "J", as estimated. Non-detected compounds were not flagged.

Second Column Confirmation

The second column confirmation percent difference (%D) for some detected parameters, exceeded the 40 %D criteria. Those results were flagged "J", as estimated. The laboratory reported the lower of the two concentrations. The individual samples and specific compounds that were flagged are listed in Table 13 below.

TABLE 13
Second Column Confirmation out of Criteria: Pesticides
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713
Charleston, SC

SDG	Sample ID	Lab Sample ID	Parameter
61741	713SB00202	61741002	Heptachlor epoxide
61741	713SB00202	61741002	4,4'-DDD
61741	713SB00202	61741002	4,4'-DDT
61741	713SB00202	61741002	Endrin ketone
61741	713SB00202	61741002	alpha-Chlordane
61741	713SB00302	61741003	Endosulfan sulfate

Polychlorinated Biphenyls (PCBs) Analyses

The QA/QC parameters for the Polychlorinated Biphenyls analyses for all of the samples were within acceptable control limits, except as noted below:

Holding Times

All holding times were met except for samples 61741003RE (713SB00302RE). This sample was re-extracted 14 days beyond the 14 day holding time. No analytes were detected in this sample. Results were qualified "UJ".

Initial and Continuing Calibration Criteria

All initial calibration criteria and continuing calibration criteria were met, except as listed in Table 14.

TABLE 14
Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: PCBs
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation or R^2 (ICAL)/ %Difference (CCAL)	Associated Samples
ECD3A-#2-CCAL-06/18/02, 1650	Aroclor-1260	16.2% low	61741001, 61741002, 61741003, 61741004
ECD3A-#1-CCAL-06/18/02, 1800	Aroclor-1260	25.8% low	61741001, 61741002, 61741003, 61741004
ECD3A-#2-CCAL-06/18/02, 1800	Aroclor-1260	26.4% low	61741001, 61741002, 61741003, 61741004

Flags were applied to the compounds in the associated samples in the following manner:

- When the percent difference (%D) was low in the continuing calibration standards, detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.

Inorganic Parameters

Quality Control Review

The following list represents the QA/QC measures that are typically reviewed during the data quality evaluation procedure for inorganic parameters.

- **Holding Times** – The holding times are evaluated to verify that samples were extracted and analyzed within holding times.
- **Blank samples** – Sample preparation, initial calibration blanks/continuing calibration blanks, and equipment blanks were provided for this project. Blank samples enable the reviewer to determine if an analyte may be attributed to sampling or laboratory procedures, rather than environmental contamination from site activities.
- **Lab Control Sample (LCS)** – This sample is a "controlled matrix", in which target parameters have been added prior to digestion/analysis. The recoveries serve as a monitor of the overall performance of each step during the analysis, including sample preparation.
- **Field Duplicate Samples** – These samples are collected to determine precision between a native and its duplicate. This information can only be determined when target compounds are detected.
- **Pre/Post Digestion Spike (MS/MSD)** – Spike recovery is used to evaluate potential matrix interferences, as well as accuracy. Precision information is also determined by calculating the reproducibility between the recoveries of each spiked parameter.
- **ICP Interference Check Sample** – This sample verifies the lab's interelement and background correction factors.
- **Initial Calibration Verification** – This parameter ensures that the instrument is capable of producing acceptable quantitative data for the target analyte list to be measured.
- **Continuing Calibration Verification** – This one-point, mid-range parameter establishes that the initial calibration is still valid by checking the performance of the instrument on a continual basis.
- **ICP Serial Dilution** – The serial dilution of samples quantitated by ICP determines whether or not significant physical or chemical interferences exist due to the sample matrix.

Metals Analyses

The QA/QC parameters for the Metals analyses for all of the samples were within acceptable control limits, except as noted below.

Blanks

The metals target parameters detected in blank samples are listed in Table 15.

TABLE 15
Blank Contamination: Metals
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Flag Concentrations less than the value listed below
61559	CCB		CCB	Aluminum	16.6	µg/L	4.15 mg/Kg
61559	CCB		CCB	Arsenic	4.03	µg/L	1.0075 mg/Kg
61559	CCB		CCB	Barium	0.512	µg/L	0.128mg/Kg
61559	CCB		CCB	Beryllium	0.250	µg/L	0.0625 mg/Kg
61559	CCB		CCB	Cadmium	0.479	µg/L	0.1198 mg/Kg
61559	CCB		CCB	Calcium	36.4	µg/L	9.1 mg/Kg
61559	CCB		CCB	Chromium	0.768	µg/L	0.192 mg/Kg
61559	CCB		CCB	Cobalt	0.627	µg/L	0.15675 mg/Kg
61559	CCB		CCB	Iron	17.5	µg/L	4.375 mg/Kg
61559	CCB		CCB	Magnesium	20.6	µg/L	5.15 mg/Kg
61559	CCB		CCB	Manganese	0.569	µg/L	0.14225 mg/Kg
61559	CCB		CCB	Selenium	3.05	µg/L	0.7625 mg/Kg
61559	CCB		CCB	Sodium	92.3	µg/L	23.075 mg/Kg
61559	CCB		CCB	Vanadium	0.838	µg/L	0.2095 mg/Kg
61559	CCB		CCB	Zinc	2.25	µg/L	0.5625 mg/Kg
61559	1200234646	1200234646	LB	Barium	0.025	mg/Kg	0.125 mg/Kg
61559	1200234646	1200234646	LB	Cadmium	0.025	mg/Kg	0.125 mg/Kg
61559	1200234646	1200234646	LB	Calcium	1.69	mg/Kg	8.45 mg/Kg
61559	1200234646	1200234646	LB	Zinc	0.208	mg/Kg	1.04 mg/Kg
61559	1200234646	1200234646	LB	Iron	0.833	mg/Kg	4.165 mg/Kg
61559	1200234646	1200234646	LB	Chromium	0.087	mg/Kg	0.435 mg/Kg

TABLE 15
Blank Contamination: Metals
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Flag Concentrations less than the value listed below
61559	1200234646	1200234646	LB	Sodium	8.19	mg/Kg	40.95 mg/Kg
61560	CCB		CCB	Barium	0.271	µg/L	1.355 µg/L
61560	CCB		CCB	Cadmium	0.376	µg/L	1.88 µg/L
61560	CCB		CCB	Beryllium	0.242	µg/L	1.21 µg/L
61560	CCB		CCB	Calcium	21.5	µg/L	107.5 µg/L
61560	CCB		CCB	Zinc	2.04	µg/L	10.2 µg/L
61560	CCB		CCB	Iron	3.9	µg/L	19.5 µg/L
61560	1200234652	1200234652	LB	Zinc	2.08	µg/L	10.4 µg/L
61560	1200234652	1200234652	LB	Iron	2.6	µg/L	13.0 µg/L
61738	CCB		CCB	Barium	0.271	µg/L	1.355 µg/L
61738	CCB		CCB	Cadmium	0.376	µg/L	1.88 µg/L
61738	CCB		CCB	Beryllium	0.242	µg/L	1.21 µg/L
61738	CCB		CCB	Calcium	21.5	µg/L	107.5 µg/L
61738	CCB		CCB	Zinc	2.04	µg/L	10.2 µg/L
61738	CCB		CCB	Iron	3.9	µg/L	19.5 µg/L
61738	1200234652	1200234652	LB	Zinc	2.08	µg/L	10.4 µg/L
61738	1200234652	1200234652	LB	Iron	2.6	µg/L	13.0 µg/L
61738	713EB001M1	61738002	EB	Barium **	12.3	µg/L	61.5 µg/L **
61738	713EB001M1	61738002	EB	Calcium **	16200	µg/L	81000 µg/L **
61738	713EB001M1	61738002	EB	Copper **	10.5	µg/L	52.5 µg/L **
61738	713EB001M1	61738002	EB	Iron **	9.48	µg/L	47.4 µg/L **
61738	713EB001M1	61738002	EB	Magnesium **	2240	µg/L	11200 µg/L **
61738	713EB001M1	61738002	EB	Manganese **	1.73	µg/L	8.65 µg/L **
61738	713EB001M1	61738002	EB	Nickel **	7.95	µg/L	39.75 µg/L **
61738	713EB001M1	61738002	EB	Potassium **	2410	µg/L	12050 µg/L **
61738	713EB001M1	61738002	EB	Sodium **	21200	µg/L	106000 µg/L **
61738	713EB001M1	61738002	EB	Vanadium **	1.58	µg/L	7.9 µg/L **

TABLE 15
Blank Contamination: Metals
Charleston Naval Complex, Zone E AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Flag Concentrations less than the value listed below
61738	713EB001M1	61738002	EB	Zinc **	14.8	µg/L	74 µg/L **
61741	713EB001M1	61738002	EB	Barium **	12.3	µg/L	61.5 µg/L **
61741	713EB001M1	61738002	EB	Calcium **	16200	µg/L	81000 µg/L **
61741	713EB001M1	61738002	EB	Copper **	10.5	µg/L	52.5 µg/L **
61741	713EB001M1	61738002	EB	Iron **	9.48	µg/L	47.4 µg/L **
61741	713EB001M1	61738002	EB	Magnesium **	2240	µg/L	11200 µg/L **
61741	713EB001M1	61738002	EB	Manganese **	1.73	µg/L	8.65 µg/L **
61741	713EB001M1	61738002	EB	Nickel **	7.95	µg/L	39.75 µg/L **
61741	713EB001M1	61738002	EB	Potassium **	2410	µg/L	12050 µg/L **
61741	713EB001M1	61738002	EB	Sodium **	21200	µg/L	106000 µg/L **
61741	713EB001M1	61738002	EB	Vanadium **	1.58	µg/L	7.9 µg/L **
61741	713EB001M1	61738002	EB	Zinc **	14.8	µg/L	74 µg/L **
61741	1200234646	1200234646	LB	Barium	0.025	mg/Kg	0.125 mg/Kg
61741	1200234646	1200234646	LB	Cadmium	0.025	mg/Kg	0.125 mg/Kg
61741	1200234646	1200234646	LB	Calcium	1.69	mg/Kg	8.45 mg/Kg
61741	1200234646	1200234646	LB	Zinc	0.208	mg/Kg	1.04 mg/Kg
61741	1200234646	1200234646	LB	Iron	0.833	mg/Kg	4.165 mg/Kg
61741	1200234646	1200234646	LB	Chromium	0.087	mg/Kg	0.435 mg/Kg
61741	1200234646	1200234646	LB	Sodium	8.19	mg/Kg	40.95 mg/Kg
61741	ICB		ICB	Barium	0.218	µg/L	13.0 mg/Kg
61741	ICB		ICB	Cadmium	0.328	µg/L	13.0 mg/Kg
61741	CCB		CCB	Barium	0.512	µg/L	0.128 mg/Kg
61741	CCB		CCB	Cadmium	0.479	µg/L	0.120 mg/Kg
61741	CCB		CCB	Beryllium	0.25	µg/L	0.0625 mg/Kg
61741	CCB		CCB	Calcium	36.4	µg/L	9.1 mg/Kg
61741	CCB		CCB	Zinc	2.25	µg/L	0.5625 mg/Kg
61741	CCB		CCB	Iron	17.5	µg/L	4.375 mg/Kg

TABLE 15
Blank Contamination: Metals
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Flag Concentrations less than the value listed below
61741	CCB		CCB	Magnesium	20.6	µg/L	5.15 mg/Kg
61741	CCB		CCB	Manganese	0.569	µg/L	0.14225 mg/Kg
61741	CCB		CCB	Cobalt	0.854	µg/L	0.2135 mg/Kg
61741	CCB		CCB	Aluminum	16.6	µg/L	4.15 mg/Kg
61741	CCB		CCB	Chromium	0.768	µg/L	0.192 mg/Kg
61741	CCB		CCB	Sodium	92.3	µg/L	23.075 mg/Kg
61741	CCB		CCB	Vanadium	0.838	µg/L	0.2095 mg/Kg
61741	CCB		CCB	Selenium	3.05	µg/L	0.7625 mg/Kg
64902	CCB		CCB	Barium	0.197	µg/L	0.985 µg/L
64902	CCB		CCB	Cadmium	0.333	µg/L	1.665 µg/L
64902	CCB		CCB	Iron	2.83	µg/L	14.15 µg/L
64902	CCB		CCB	Lead	1.92	µg/L	9.6 µg/L
64902	CCB		CCB	Magnesium	5.20	µg/L	26 µg/L
64902	CCB		CCB	Mercury	0.0789	µg/L	0.3945 µg/L
64902	CCB		CCB	Nickel	1.15	µg/L	5.75 µg/L
64902	CCB		CCB	Sodium	85.9	µg/L	429.5 µg/L
64902	1200280184	1200280184	LB	Iron	2.30	µg/L	11.5 µg/L
64902	1200280184	1200280184	LB	Mercury	0.077	µg/L	0.385 µg/L
64902	1200280184	1200280184	LB	Sodium	60.5	µg/L	302.5 µg/L
64902	037EW001M2	64902002	EB	Aluminum	45.8	µg/L	229 µg/L
64902	037EW001M2	64902002	EB	Calcium	20.9	µg/L	104.5 µg/L
64902	037EW001M2	64902002	EB	Mercury	0.071	µg/L	0.355 µg/L
64902	037EW001M2	64902002	EB	Sodium	43.2	µg/L	216 µg/L

** Results from equipment blank 713EB001M1 (61738002) were not used to qualify data for blank contamination. Potable water was used for the equipment blank sample, therefore the results were considered to be anomalous and not consistent with analyte levels typically found in equipment blank samples.

If a target parameter determined to be a common contaminant was reported in a field sample, and the concentration was below the level determined to be due to blank contamination, the following actions were taken:

- If the concentration was above the reporting limit, the numeric result was unchanged, but it was flagged "U", as undetected.
- If the concentration was below the reporting limit, the numeric result was changed to the value of the reporting limit, and it was flagged "U", as undetected.

The results qualified due to blank contamination are listed in Attachment 1.

Recoveries - MS/MSD and LCS

All Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Laboratory Control Sample (LCS) recoveries were within acceptable quality control limits, except as noted in Table 16 below.

TABLE 16
MS/MSD, and LCS Recoveries and RPDs Out of QC Limits: Metals
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample	Parameter	Recovery	Recovery Limits	RPD	RPD Limits	Associated Samples	Flag
61559	716VAOS1M1 MS/MSD	Antimony	71.8* / 62.5*	80-120			61559001	Detects-J, non-detects-UJ
		Potassium	68.5* / 38.2*	80-120				
		Selenium	85.7 / 72.9*	80-120				
		Barium	193.4* / 136.2*	80-120			61559001	Detects only - J
		Nickel	198.8* / 178.3*	80-120				
		Chromium	89.6 / 125.3*	80-120				
		Mercury	-12.8* / -62.5*	80-120			61559001	Detects-J, non-detects-R
61741	716VAOS1M1 MS/MSD	Antimony	71.8* / 62.5*	80-120			61741 – All	Detects-J, non-detects-UJ
		Potassium	68.5* / 38.2*	80-120				
		Selenium	85.7 / 72.9*	80-120				
		Barium	193.4* / 136.2*	80-120			61741 - All	Detects only - J
		Nickel	198.8* / 178.3*	80-120				
		Chromium	89.6 / 125.3*	80-120				
		Mercury	143.8* / 128.3*	80-120				

* - out of control limits

Rejected Data

The majority of rejected data were associated with re-runs and dilutions (you can only have a single valid result per parameter per sample). However, there were selected results qualified as "R", rejected, due to associated QC parameters out of criteria. The rejected data are summarized in Table 17 below.

TABLE 17
Data Qualification Summary: Rejected Data
Charleston Naval Complex, Zone E, AOC 716 and Zone F, AOC 713, Charleston, SC

SDG	Sample ID	Parameter Class	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reason
61560	716ZAOS1M1	VOA	2-Chloroethyl vinyl ether	5	U	5	R	ug/L	MS
61967	713GP001M1	VOA	2-Chloroethyl vinyl ether	5	U	5	R	ug/L	MS

Conclusion

A review of the analytical data submitted regarding the investigation of Zone E, AOC 716 and Zone F, AOC 713 at the Charleston Naval Complex, Charleston, South Carolina by CH2M HILL has been completed. An overall evaluation of the data indicates that the sample handling, shipment, and analytical procedures have been adequately completed, and that the analytical results should be considered usable as qualified.

As discussed above, there were specific results that were rejected, in which the data cannot be used. With the exception of these results, the validation review demonstrated that the analytical systems were generally in control and the data can be used in the decision making process.

Attachment 1 - Changed Qualifiers and Results
Zone F, AOC 713 and Z E, AOC 716 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	ANTIMONY	1.36	BN	1.36	J	mg/kg	MS
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	ARSENIC	1.97	B	1.97	J	mg/kg	IB
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	BARIUM	65.1	N	65.1	J	mg/kg	MS
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	BERYLLIUM	0.144	B	0.144	U	mg/kg	BL
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	CADMIUM	1.45	B	1.45	U	mg/kg	BL
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	CHROMIUM, TOTAL	103	N	103	J	mg/kg	MS
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	COBALT	3.39	B	3.39	J	mg/kg	IB
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	MAGNESIUM	1370	BN*	1370	J	mg/kg	IB
61559	716VAOS1M1	61559001	SO	METAL	SW7471A	MERCURY	0.314	N*	0.314	J	mg/kg	MS
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	NICKEL	25.5	N	25.5	J	mg/kg	MS
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	POTASSIUM	419	BN	419	J	mg/kg	MS
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	SELENIUM	0.433	BN	0.433	J	mg/kg	MS
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	SILVER	0.572	B	0.572	J	mg/kg	IB
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	SODIUM	62.8	B	62.8	J	mg/kg	IB
61559	716VAOS1M1	61559001	SO	METAL	SW6010B	VANADIUM	11	B	11	J	mg/kg	IB
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	1,4-DICHLOROBENZENE	503	U	503	UJ	ug/kg	MD
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	ACENAPHTHENE	21.2	J	21.2	J	ug/kg	MD
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	BENZO(g,h,i)PERYLENE	503	U	503	UJ	ug/kg	CC
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	Benzoic acid	2440	U	2440	UJ	ug/kg	CC
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	503	U	503	UJ	ug/kg	CC
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	503	U	503	UJ	ug/kg	CC
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	503	U	503	UJ	ug/kg	CC
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	N-NITROSODI-n-PROPYLAMINE	503	U	503	UJ	ug/kg	MD
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	PHENOL	503	U	503	UJ	ug/kg	MD
61559	716VAOS1M1	61559001	SO	SVOA	SW8270C	PYRENE	201	J	201	J	ug/kg	MD
61560	716ZAOS1M1	61560001	WG	METAL	SW6010B	ALUMINUM	110	B	110	J	ug/L	IB
61560	716ZAOS1M1	61560001	WG	METAL	SW6010B	CADMIUM	0.495	B	0.495	U	ug/L	BL
61560	716ZAOS1M1	61560001	WG	METAL	SW6010B	CHROMIUM, TOTAL	1.68	B	1.68	J	ug/L	IB
61560	716ZAOS1M1	61560001	WG	METAL	SW6010B	MAGNESIUM	2210	B	2210	J	ug/L	IB
61560	716ZAOS1M1	61560001	WG	METAL	SW6010B	NICKEL	3.82	B	3.82	J	ug/L	IB
61560	716ZAOS1M1	61560001	WG	METAL	SW6010B	POTASSIUM	3280	B	3280	J	ug/L	IB

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
1560	716ZAOS1M1	61560001	WG	METAL	SW6010B	SELENIUM	2.94	B	2.94	J	ug/L	IB
1560	716ZAOS1M1	61560001	WG	METAL	SW6010B	VANADIUM	1.58	B	1.58	J	ug/L	IB
1560	716ZAOS1M1	61560001	WG	VOA	SW8260B	1,2,3-Trichlorobenzene	5	U	5	UJ	ug/L	MS
1560	716ZAOS1M1	61560001	WG	VOA	SW8260B	1,3-DICHLOROBENZENE	5	U	5	UJ	ug/L	MS
1560	716ZAOS1M1	61560001	WG	VOA	SW8260B	2-Chloroethyl vinyl ether	5	U	5	R	ug/L	MS
1560	716ZAOS1M1	61560001	WG	VOA	SW8260B	ACETONE	2.5	JB	10	U	ug/L	BL
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	ALUMINUM	129	B	129	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	ANTIMONY	7.79	B	7.79	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	BARIUM	6.25	B	6.25	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	CADMIUM	0.531	B	0.531	U	ug/L	BL
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	CHROMIUM, TOTAL	1.36	B	1.36	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	COPPER	17.4	B	17.4	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	LEAD	2.42	B	2.42	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	MAGNESIUM	248	B	248	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	MANGANESE	6.77	B	6.77	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	POTASSIUM	1510	B	1510	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	SODIUM	1670	B	1670	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	METAL	SW6010B	VANADIUM	4.54	B	4.54	J	ug/L	IB
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ALDRIN	0.04	U	0.04	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ALPHA BHC	0.04	U	0.04	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ALPHA-CHLORDANE	0.04	U	0.04	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	BETA BHC	0.04	U	0.04	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	Chlordane	0.4	U	0.4	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	DELTA BHC	0.04	U	0.04	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	DIELDRIN	0.079	U	0.079	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ENDOSULFAN I	0.04	U	0.04	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ENDOSULFAN II	0.079	U	0.079	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ENDOSULFAN SULFATE	0.079	U	0.079	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ENDRIN	0.079	U	0.079	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ENDRIN ALDEHYDE	0.079	U	0.079	UJ	ug/L	SS
1738	713ZAOS1M1	61738001	WG	PEST	SW8081A	ENDRIN KETONE	0.079	U	0.079	UJ	ug/L	SS

Attachment 1 - Changed Qualifiers and Results
Zone F, AOC 713 and Z E, AOC 716 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	GAMMA BHC (LINDANE)	0.04	U	0.04	UJ	ug/L	SS
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	GAMMA-CHLORDANE	0.04	U	0.04	UJ	ug/L	SS
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	HEPTACHLOR	0.04	U	0.04	UJ	ug/L	BS, SS
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	HEPTACHLOR EPOXIDE	0.04	U	0.04	UJ	ug/L	SS
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	METHOXYCHLOR	0.38	U	0.38	UJ	ug/L	SS
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	p,p'-DDD	0.079	U	0.079	UJ	ug/L	SS
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	p,p'-DDE	0.079	U	0.079	UJ	ug/L	SS
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	p,p'-DDT	0.079	U	0.079	UJ	ug/L	SS
61738	713ZAOS1M1	61738001	WG	PEST	SW8081A	TOXAPHENE	2.5	U	2.5	UJ	ug/L	SS
61738	713ZAOS1M1	61738001	WG	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	19.4	U	19.4	UJ	ug/L	CC
61738	713ZAOS1M1	61738001	WG	SVOA	SW8270C	bis(2-ETHYLHEXYL) PHTHALATE	4	J	9.7	U	ug/L	BL
61738	713ZAOS1M1	61738001	WG	VOA	SW8260B	2-Chloroethyl vinyl ether	5	U	5	UJ	ug/L	CC
61738	713ZAOS1M1	61738001	WG	VOA	SW8260B	ACETONE	9	J	10	U	ug/L	BL
61741	713SB00102	61741001	SO	METAL	SW6010B	ANTIMONY	0.741	UN	0.741	UJ	mg/kg	MS
61741	713SB00202	61741002	SO	METAL	SW6010B	ANTIMONY	0.535	UN	0.535	UJ	mg/kg	MS
61741	713SB00302	61741003	SO	METAL	SW6010B	ANTIMONY	0.953	UN	0.953	UJ	mg/kg	MS
61741	713VAOS1M1	61741004	SO	METAL	SW6010B	ANTIMONY	21.5	N	21.5	J	mg/kg	MS
61741	713SB00102	61741001	SO	METAL	SW6010B	BARIUM	45.2	BN	45.2	J	mg/kg	MS
61741	713SB00202	61741002	SO	METAL	SW6010B	BARIUM	18.7	BN	18.7	J	mg/kg	MS
61741	713SB00302	61741003	SO	METAL	SW6010B	BARIUM	56.1	BN	56.1	J	mg/kg	MS
61741	713VAOS1M1	61741004	SO	METAL	SW6010B	BARIUM	82.7	N	82.7	J	mg/kg	MS
61741	713SB00102	61741001	SO	METAL	SW6010B	BERYLLIUM	1.34	B	1.34	J	mg/kg	IB
61741	713SB00202	61741002	SO	METAL	SW6010B	BERYLLIUM	0.34	B	0.34	J	mg/kg	IB
61741	713SB00302	61741003	SO	METAL	SW6010B	BERYLLIUM	1.71	B	1.71	J	mg/kg	IB
61741	713VAOS1M1	61741004	SO	METAL	SW6010B	BERYLLIUM	0.181	B	0.181	J	mg/kg	IB
61741	713SB00102	61741001	SO	METAL	SW6010B	CADMIUM	0.213	B	0.213	J	mg/kg	IB
61741	713SB00202	61741002	SO	METAL	SW6010B	CADMIUM	0.108	B	0.108	U	mg/kg	BL
61741	713SB00302	61741003	SO	METAL	SW6010B	CADMIUM	0.241	B	0.241	J	mg/kg	IB
61741	713SB00102	61741001	SO	METAL	SW6010B	CHROMIUM, TOTAL	45.9	N	45.9	J	mg/kg	MS
61741	713SB00202	61741002	SO	METAL	SW6010B	CHROMIUM, TOTAL	14.5	N	14.5	J	mg/kg	MS
61741	713SB00302	61741003	SO	METAL	SW6010B	CHROMIUM, TOTAL	59.6	N	59.6	J	mg/kg	MS

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
741	713VAOS1M1	61741004	SO	METAL	SW6010B	CHROMIUM, TOTAL	73	N	73	J	mg/kg	MS
741	713SB00102	61741001	SO	METAL	SW6010B	COBALT	8.01	B	8.01	J	mg/kg	IB
741	713SB00202	61741002	SO	METAL	SW6010B	COBALT	2.13	B	2.13	J	mg/kg	IB
741	713SB00302	61741003	SO	METAL	SW6010B	COBALT	8.07	B	8.07	J	mg/kg	IB
741	713VAOS1M1	61741004	SO	METAL	SW6010B	COBALT	4.57	B	4.57	J	mg/kg	IB
741	713SB00202	61741002	SO	METAL	SW6010B	MAGNESIUM	871	BN*	871	J	mg/kg	IB
741	713VAOS1M1	61741004	SO	METAL	SW6010B	MAGNESIUM	1190	BN*	1190	J	mg/kg	IB
741	713SB00102	61741001	SO	METAL	SW7471A	MERCURY	0.186	N	0.186	J	mg/kg	MS
741	713SB00202	61741002	SO	METAL	SW7471A	MERCURY	0.06	BN	0.06	J	mg/kg	MS
741	713SB00302	61741003	SO	METAL	SW7471A	MERCURY	0.159	BN	0.159	J	mg/kg	MS
741	713VAOS1M1	61741004	SO	METAL	SW7471A	MERCURY	0.15	N	0.15	J	mg/kg	MS
741	713SB00102	61741001	SO	METAL	SW6010B	NICKEL	15.3	N	15.3	J	mg/kg	MS
741	713SB00202	61741002	SO	METAL	SW6010B	NICKEL	4.87	BN	4.87	J	mg/kg	MS
741	713SB00302	61741003	SO	METAL	SW6010B	NICKEL	19.4	N	19.4	J	mg/kg	MS
741	713VAOS1M1	61741004	SO	METAL	SW6010B	NICKEL	66.8	N	66.8	J	mg/kg	MS
741	713SB00102	61741001	SO	METAL	SW6010B	POTASSIUM	1930	N	1930	J	mg/kg	MS
741	713SB00202	61741002	SO	METAL	SW6010B	POTASSIUM	425	BN	425	J	mg/kg	MS
741	713SB00302	61741003	SO	METAL	SW6010B	POTASSIUM	2380	N	2380	J	mg/kg	MS
741	713VAOS1M1	61741004	SO	METAL	SW6010B	POTASSIUM	195	BN	195	J	mg/kg	MS
741	713SB00102	61741001	SO	METAL	SW6010B	SELENIUM	1.26	BN	1.26	J	mg/kg	MS
741	713SB00202	61741002	SO	METAL	SW6010B	SELENIUM	0.298	UN	0.298	UJ	mg/kg	MS
741	713SB00302	61741003	SO	METAL	SW6010B	SELENIUM	1.67	BN	1.67	J	mg/kg	MS
741	713VAOS1M1	61741004	SO	METAL	SW6010B	SELENIUM	0.82	BN	0.82	J	mg/kg	MS
741	713VAOS1M1	61741004	SO	METAL	SW6010B	SILVER	1.63	B	1.63	J	mg/kg	IB
741	713SB00102	61741001	SO	METAL	SW6010B	SODIUM	981	B	981	J	mg/kg	IB
741	713SB00202	61741002	SO	METAL	SW6010B	SODIUM	118	B	118	J	mg/kg	IB
741	713SB00302	61741003	SO	METAL	SW6010B	SODIUM	1030	B	1030	J	mg/kg	IB
741	713VAOS1M1	61741004	SO	METAL	SW6010B	SODIUM	76	B	76	J	mg/kg	IB
741	713SB00302	61741003	SO	PCB	SW8082	PCB-1016 (AROCHLOR 1016)	66.9	U	66.9	R	ug/kg	RE
741	713SB00302RE	61741003	SO	PCB	SW8082	PCB-1016 (AROCHLOR 1016)	66.9	U	66.9	UJ	ug/kg	HT
741	713SB00302	61741003	SO	PCB	SW8082	PCB-1221 (AROCHLOR 1221)	66.9	U	66.9	R	ug/kg	RE

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61741	713SB00302RE	61741003	SO	PCB	SW8082	PCB-1221 (AROCHLOR 1221)	66.9	U	66.9	UJ	ug/kg	HT
61741	713SB00302	61741003	SO	PCB	SW8082	PCB-1232 (AROCHLOR 1232)	66.9	U	66.9	R	ug/kg	RE
61741	713SB00302RE	61741003	SO	PCB	SW8082	PCB-1232 (AROCHLOR 1232)	66.9	U	66.9	UJ	ug/kg	HT
61741	713SB00302	61741003	SO	PCB	SW8082	PCB-1242 (AROCHLOR 1242)	66.9	U	66.9	R	ug/kg	RE
61741	713SB00302RE	61741003	SO	PCB	SW8082	PCB-1242 (AROCHLOR 1242)	66.9	U	66.9	UJ	ug/kg	HT
61741	713SB00302	61741003	SO	PCB	SW8082	PCB-1248 (AROCHLOR 1248)	66.9	U	66.9	R	ug/kg	RE
61741	713SB00302RE	61741003	SO	PCB	SW8082	PCB-1248 (AROCHLOR 1248)	66.9	U	66.9	UJ	ug/kg	HT
61741	713SB00302	61741003	SO	PCB	SW8082	PCB-1254 (AROCHLOR 1254)	136	U	136	R	ug/kg	RE
61741	713SB00302RE	61741003	SO	PCB	SW8082	PCB-1254 (AROCHLOR 1254)	136	U	136	UJ	ug/kg	HT
61741	713SB00102	61741001	SO	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	107	U	107	UJ	ug/kg	CC
61741	713SB00202	61741002	SO	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	80.1	U	80.1	UJ	ug/kg	CC
61741	713SB00302	61741003	SO	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	136	U	136	R	ug/kg	RE
61741	713SB00302RE	61741003	SO	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	136	U	136	UJ	ug/kg	HT
61741	713VAOS1M1	61741004	SO	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	458	U	458	UJ	ug/kg	CC
61741	713SB00202	61741002	SO	PEST	SW8081A	ALPHA-CHLORDANE	18.7	P	18.7	J	ug/kg	2C
61741	713SB00302	61741003	SO	PEST	SW8081A	ENDOSULFAN SULFATE	0.41	JP	0.41	J	ug/kg	2C
61741	713SB00202	61741002	SO	PEST	SW8081A	ENDRIN KETONE	3.7	JP	3.7	J	ug/kg	2C
61741	713SB00202	61741002	SO	PEST	SW8081A	HEPTACHLOR EPOXIDE	3.8	JP	3.8	J	ug/kg	2C
61741	713SB00202	61741002	SO	PEST	SW8081A	p,p'-DDD	2.1	JP	2.1	J	ug/kg	2C
61741	713SB00202	61741002	SO	PEST	SW8081A	p,p'-DDT	13.1	JP	13.1	J	ug/kg	2C
61741	713SB00102	61741001	SO	SVOA	SW8270C	4-NITROPHENOL	2550	U	2550	UJ	ug/kg	CC
61741	713SB00202	61741002	SO	SVOA	SW8270C	4-NITROPHENOL	1910	U	1910	UJ	ug/kg	CC
61741	713SB00302	61741003	SO	SVOA	SW8270C	4-NITROPHENOL	3240	U	3240	UJ	ug/kg	CC
61741	713VAOS1M1	61741004	SO	SVOA	SW8270C	4-NITROPHENOL	8760	U	8760	UJ	ug/kg	CC
61741	713SB00102	61741001	SO	SVOA	SW8270C	Benzyl alcohol	526	U	526	UJ	ug/kg	CC
61741	713SB00202	61741002	SO	SVOA	SW8270C	Benzyl alcohol	395	U	395	UJ	ug/kg	CC
61741	713SB00102	61741001	SO	SVOA	SW8270C	DIETHYL PHTHALATE	80.4	J	80.4	J	ug/kg	CC
61741	713SB00202	61741002	SO	SVOA	SW8270C	DIETHYL PHTHALATE	61.7	J	61.7	J	ug/kg	CC
61741	713SB00202	61741002	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	395	U	395	UJ	ug/kg	CC
61967	713GP002M1	61967002	WG	PEST	SW8081A	BETA BHC	0.04	U	0.04	UJ	ug/L	CC
61967	713GP003M1	61967003	WG	PEST	SW8081A	BETA BHC	0.038	U	0.038	UJ	ug/L	CC

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
1967	713GP002M1	61967002	WG	PEST	SW8081A	DELTA BHC	0.04	U	0.04	UJ	ug/L	CC
1967	713GP003M1	61967003	WG	PEST	SW8081A	DELTA BHC	0.038	U	0.038	UJ	ug/L	CC
1967	713GP001M1	61967001	WG	PEST	SW8081A	DIELDRIN	0.084	U	0.084	UJ	ug/L	CC
1967	713GP001M1	61967001	WG	PEST	SW8081A	ENDRIN	0.084	U	0.084	UJ	ug/L	CC
1967	713GP001M1	61967001	WG	PEST	SW8081A	METHOXYCHLOR	0.4	U	0.4	UJ	ug/L	IC
1967	713GP001M1	61967001	WG	PEST	SW8081A	p,p'-DDE	0.084	U	0.084	UJ	ug/L	CC
1967	713GP001M1	61967001	WG	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	20.4	U	20.4	UJ	ug/L	CC
1967	713GP002M1	61967002	WG	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	19.7	U	19.7	UJ	ug/L	CC
1967	713GP003M1	61967003	WG	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	19.6	U	19.6	UJ	ug/L	CC
1967	713GP001M1	61967001	WG	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	10.2	U	10.2	UJ	ug/L	IC
1967	713GP002M1	61967002	WG	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	9.8	U	9.8	UJ	ug/L	IC
1967	713GP003M1	61967003	WG	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	9.8	U	9.8	UJ	ug/L	IC
1967	713GP001M1	61967001	WG	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	10.2	U	10.2	UJ	ug/L	IC
1967	713GP002M1	61967002	WG	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	9.8	U	9.8	UJ	ug/L	IC
1967	713GP003M1	61967003	WG	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	9.8	U	9.8	UJ	ug/L	IC
1967	713GP001M1	61967001	WG	VOA	SW8260B	2-Chloroethyl vinyl ether	5	U	5	R	ug/L	MS
1967	713GP001M1	61967001	WG	VOA	SW8260B	Vinyl acetate	10	U	10	UJ	ug/L	CC
1967	713GP002M1	61967002	WG	VOA	SW8260B	Vinyl acetate	10	U	10	UJ	ug/L	CC,BS
1967	713GP003M1	61967003	WG	VOA	SW8260B	Vinyl acetate	10	U	10	UJ	ug/L	CC,BS
3281	713VA0S1M3	63281003	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	1410	U	1410	UJ	ug/kg	IC, CC
3281	716VA0S1M3	63281004	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	18.6	U	18.6	UJ	ug/kg	IC, CC
3281	713VA0S1M3	63281003	SO	VOA	SW8260B	ACETONE	1410	U	1410	UJ	ug/kg	CC
3281	716VA0S1M3	63281004	SO	VOA	SW8260B	ACETONE	41.6	=	41.6	J	ug/kg	CC
3281	713VA0S1M3	63281003	SO	VOA	SW8260B	TOLUENE	106	J	707	U	ug/kg	BL
3281	713VA0S1M3	63281003	SO	VOA	SW8260B	Vinyl acetate	1410	U	1410	UJ	ug/kg	CC, BS
3281	716VA0S1M3	63281004	SO	VOA	SW8260B	Vinyl acetate	18.6	U	18.6	UJ	ug/kg	CC, BS
3437	713SB00603	63437006	SO	VOA	SW8260B	1,2,3-Trichlorobenzene	14.1	U	14.1	UJ	ug/kg	IS
3437	713SB00603	63437006	SO	VOA	SW8260B	1,2,4-TRICHLOROBENZENE	14.1	U	14.1	UJ	ug/kg	IS
3437	713SB00603	63437006	SO	VOA	SW8260B	1,2-DICHLOROBENZENE	14.1	U	14.1	UJ	ug/kg	IS
3437	713SB00603	63437006	SO	VOA	SW8260B	1,3-DICHLOROBENZENE	14.1	U	14.1	UJ	ug/kg	IS
3437	713SB00603	63437006	SO	VOA	SW8260B	1,4-DICHLOROBENZENE	14.1	U	14.1	UJ	ug/kg	IS

Attachment 1 - Changed Qualifiers and Results
Zone F, AOC 713 and Z E, AOC 716 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
63437	713SB00603	63437006	SO	VOA	SW8260B	2-BUTANONE (MEK)	11	J	28.1	U	ug/kg	BL
63437	713SB00403	63437004	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	10.9	U	10.9	UJ	ug/kg	IC,CC
63437	713SB00503	63437005	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	10.9	U	10.9	UJ	ug/kg	IC,CC
63437	713SB00603	63437006	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	28.1	U	28.1	UJ	ug/kg	IC,CC
63437	713SB00403	63437004	SO	VOA	SW8260B	ACETONE	29.8	=	29.8	UJ	ug/kg	BL,CC
63437	713SB00503	63437005	SO	VOA	SW8260B	ACETONE	10.9	U	10.9	UJ	ug/kg	CC
63437	713SB00603	63437006	SO	VOA	SW8260B	ACETONE	56.8	=	56.8	UJ	ug/kg	BL,CC
63437	713SB00403	63437004	SO	VOA	SW8260B	CHLOROMETHANE	10.9	U	10.9	UJ	ug/kg	CC
63437	713SB00503	63437005	SO	VOA	SW8260B	CHLOROMETHANE	10.9	U	10.9	UJ	ug/kg	CC
63437	713SB00603	63437006	SO	VOA	SW8260B	CHLOROMETHANE	28.1	U	28.1	UJ	ug/kg	CC
63437	713SB00403	63437004	SO	VOA	SW8260B	Vinyl acetate	10.9	U	10.9	UJ	ug/kg	CC,BS
63437	713SB00503	63437005	SO	VOA	SW8260B	Vinyl acetate	10.9	U	10.9	UJ	ug/kg	CC,BS
63437	713SB00603	63437006	SO	VOA	SW8260B	Vinyl acetate	28.1	U	28.1	UJ	ug/kg	CC,BS
64902	037GW001M2	64902003	WG	METAL	SW6010B	BARIUM	27.3	B	27.3	J	ug/L	IB
64902	037GW001M2	64902003	WG	METAL	SW6010B	CHROMIUM, TOTAL	2.1	B	2.1	J	ug/L	IB
64902	037GW001M2	64902003	WG	METAL	SW6010B	COPPER	11.6	B	11.6	J	ug/L	IB
64902	037GW001M2	64902003	WG	METAL	SW6010B	LEAD	5.42	=	5.42	U	ug/L	BL
64902	037GW001M2	64902003	WG	METAL	SW7470A	MERCURY	0.071	B	0.071	U	ug/L	BL
64902	037GW001M2	64902003	WG	METAL	SW6010B	NICKEL	9.95	B	9.95	J	ug/L	IB
64902	037GW001M2	64902003	WG	METAL	SW6010B	VANADIUM	2.36	B	2.36	J	ug/L	IB
64902	037GW001M2	64902003	WG	SVOA	SW8270C	2,4-DINITROPHENOL	51	U	51	UJ	ug/L	IC,CC
64902	037GW001M2	64902003	WG	SVOA	SW8270C	bis(2-ETHYLHEXYL) PHTHALATE	2.2	JB	10.2	U	ug/L	BL
64902	037GW001M2	64902003	WG	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	10.2	U	10.2	UJ	ug/L	IC
64902	037GW001M2	64902003	WG	VOA	SW8260B	2-Chloroethyl vinyl ether	10	U	10	UJ	ug/L	IC
64902	037GW001M2	64902003	WG	VOA	SW8260B	Vinyl acetate	10	U	10	UJ	ug/L	CC,BS

CH2 HILL Chain of Custody/ Laboratory Analysis Form 612

COC Tracking #: **ZE716-050102-01**

Laboratory:	GEL
Project Name:	Charleston Navy Complex
Site Name:	Zone E, AOC 716
Project Number:	158814.PM.04
TAT:	standard
Project Manager:	Tom Beisel
QA Level:	level 3
Address:	GNV: 3011 SW Williston Rd., Gainesville, FL 32605
	ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278
Send Report To:	see last page of COC
EDD:	CNC format

Lab Batch/SDG: _____

Sample ID	Station ID	Sample Description	Depth Begin	Depth End	Date & Time Collected	Matrix	# of containers	VOCs (SW8260B) (3 - 5g Encore & 1 - 2oz jar)	SVOCs (SW8270C) (1 - 4 ounce jar)	Pesticides/PCBs (SW8081A/8082) (1 - 4 ounce jar)	Metals * (SW6010B/ 7000 series) (1 - 4 ounce jar)	VOCs (SW8260B) (3 - 40mL vial, HCl)	SVOCs (SW8270C) (3 - 1L amber)	Pesticides/PCBs (SW8081A/8082) (3 - 1L amber)	Metals * (SW6010B/ 7000 series) (1 - 0.5L HDPE, HNO3)			Comments
716ZAOS1M1	E716ZAOS1	OWS water			6/5/02 @ 0915	WW	7					X	X	X	X			RCRA-Site
716VAOS1M1	E716VAOS1	OWS sediment			6/5/02 @ 0920	SO	7	X	X	X	X							This Station is complete

Sampled By Stan Eller Stan Eller Date/Time 6-5-02 0920

Relinquished by: Stan Eller Stan Eller Date/Time 6-5-02 @ 1725

Additional Samplers:

Received By Lab: Mike Gunlow Date/Time 6-5-02 1725

Relinquished by: Date/Time

Received By: Date/Time

Shipped Via: UPS FedEx Hand Other Tracking#: _____

Receipt Exceptions: _____

CH2M HILL Chain of Custody/ Laboratory Analysis Form

COC Tracking #: **ZF713-050102-01** page 1 of 2

Laboratory: GEL

Project Name: Charleston Navy Complex

Site Name: Zone F, AOC 713

Project Number: 158814.PM.04

TAT: standard

Project Manager: Tom Beisel

QA Level: level 3

Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605

ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278

Send Report To: see last page of COC

EDD: CNC format

Lab Batch/SDG:

61741-Soil 61738-WTR

Sample ID	Station ID	Sample Description	Depth Begin	Depth End	Date & Time Collected	Matrix	# of containers	VOCs (SW8260B) 3 - 5g Encore & 1 - 2oz jar	SVOCs (SW8270C) 1 - 4 ounce jar	Pesticides/PCBs (SW8081A/8082) 1 - 4 ounce jar	Metals * (SW6010B/ 7000 series) 1 - 4 ounce jar	VOCs (SW8260B) 3 - 40mL vial, HCl	SVOCs (SW8270C) 3 - 1L amber	Pesticides/PCBs (SW8081A/8082) 3 - 1L amber	Metals * (SW6010B/ 7000 series) 1 - 0.5L HDPE, HNO3			Comments
713SB00102	F713SB001		3	5	6-7-02 @ 0935	SO	7	X	X	X	X							RCRA SITE
713SB00202	F713SB002		3	5	6-7-02 @ 0945	SO	7	X	X	X	X							
713SB00302	F713SB003		3	5	6-7-02 @ 0955	SO	7	X	X	X	X							
713ZAOS1M1	F713ZAOS1	OWS water			6-7-02 @ 1010	WW	7					X	X	X	X			This Station is Complete
713VAOS1M1	F713VAOS1	OWS sediment			6-7-02 @ 1200	SO	7	X	X	X	X							
713EB001M1	F713EB001				6-7-02 @ 1310	SQ	7					X	X	X	X			soil EB
713TB001M1	F713TB001				6-7-02 @ 1315	SQ	3					X						TB
713GA001M1	F713GA001	GW from soil boring			N/A	WG						X	X	X				
713GA002M1	F713GA002	GW from soil boring				WG						X	X	X				
713GA003M1	F713GA003	GW from soil boring				WG						X	X	X				
713EA001M1	F713EA001					WQ						X	X	X				water EB

Sampled By: Stan Eller Stan Eller Date/Time: 6-7-02 @ 1315

Relinquished by: Stan Eller Date/Time: 6-7-02 @ 1453

Additional Samplers:

Received By Lab: J. M Harley Date/Time: 6/7/02 @ 1445

Relinquished by: Date/Time

Received By: Date/Time

Shipped Via: UPS FedEx Hand Other Tracking#:

Remarks:

Temperature: 6 °C

Receipt Exceptions:

CH2M HILL Chain of Custody/ Laboratory Analysis Form

COC Tracking #: ZF713-061002-01 page 1 of 2

61967%

oratory: GEL

ject Name: Charleston Navy Complex

Site Name: Zone F, AOC 713

Project Number: 158814.PM.04

TAT: standard

Project Manager: Tom Beisel

QA Level: level 3

Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605

ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278

Send Report To: see last page of COC

EDD: CNC format

Lab Batch/SDG:

Sample ID	Station ID	Sample Description	Depth Begin	Depth End	Date & Time Collected	Matrix	# of containers	VOCs (SW8260B) 3 - 5g Encore & 1 - 2oz jar	SVOCs (SW8270C) 1 - 4 ounce jar	Pesticides/PCBs (SW8081A/8082) 1 - 4 ounce jar	Metals * (SW6010B/ 7000 series) 1 - 4 ounce jar	VOCs (SW8260B) 3 - 40mL vial, HCl	SVOCs (SW8270C) 3 - 1L amber	Pesticides/PCBs (SW8081A/8082)	Metals * (SW6010B/ 7000 series) 1 - 0.5L HDPE, HNO3			Comments
713GP001M1	F713GP001	GW from soil boring	19	23	6-11-02/1145	WG	6					X	X	X				
713GP002M1	F713GP002	GW from soil boring	19	23	6-11-02/1345	WG	6					X	X	X				
713GP003M1	F713GP003	GW from soil boring	19	23	6-11-02/1430	WG	6					X	X	X				
713EP001M1	F713EP001				6-11-02/1445	WQ	6					X	X	X				water EB
713TP001M!	F713EP001				lab provided	WQ	3					X						

mpled By Darryl Gates

Date/Time 6-11-02 /As noted

Relinquished by: Darryl Gates

Date/Time 6/12/02/1635

ditional Samplers:

ceived By Lab: Julie Robinson

Date/Time 6/12/02 1635

Relinquished by:

Date/Time

ceived By:

Date/Time

Shipped Via: UPS FedEx Hand Other Tracking#:

marks:

Temperature:

Receipt Exceptions:

CH2M HILL Chain of Custody/ Laboratory Analysis Form

COC Tracking #: **ZZMSL-070502-01** page 1 of 2

Laboratory: GEL

Project Name: Charleston Navy Complex

Site Name: Zone E, F & I, multiple sites

Project Number: 158814.PM.04

TAT: 7 day

Project Manager: Tom Beisel

QA Level: level 3

Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605

ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278

Send Report To: see last page of COC

EDD: CNC format

Lab Batch/SDG: 63281%, 63282%

Sample ID	Station ID	Sample Description	Depth Begin	Depth End	Date & Time Collected	Matrix	# of containers	VOCs (SW8260B) 3 - 5g Encore & 1 - 2oz jar	SVOCs (SW8270C) 1 - 4 ounce jar	Pesticides/PCBs (SW8081A/8082) 1 - 4 ounce jar	Metals * (SW6010B/ 7000 series) 1 - 4 ounce jar	VOCs (SW8260B) 3 - 40mL vial, HCl	SVOCs (SW8270C) 2 - 1L amber	Pesticides/PCBs (SW8081A/8082) 2 - 1L amber	Metals * (SW6010B/ 7000 series) 1 - 0.5L HDPE, HNO3			Comments
711VAOWSM3	I711VAOWS	OWS sediment			7-9-02 / 1435	SO	4	X										
712VA0S1M3	F712VA0S1	OWS sediment			7-9-02 / 1410	SO	4	X										
~~712SB00403~~	~~F712SB004~~	resample F712SB001	4	6		SO		X										
~~712SB00503~~	~~F712SB005~~	resample F712SB002	4	6		SO		X										
~~712SB00603~~	~~F712SB006~~	resample F712SB003	4	6		SO		X										
713VA0S1M3	F713VA0S1	OWS sediment			7-9-02 / 1300	SO	4	X										
~~713SB00403~~	~~F713SB004~~	resample F713SB004	4	6		SO		X										
~~713SB00503~~	~~F713SB005~~	resample F713SB005	4	6		SO		X										
~~713SB00603~~	~~F713SB006~~	resample F713SB006	4	6		SO		X										
~~714SB00403~~	~~F714SB004~~	resample F714SB004	4	6		SO		X										
~~714CB00403~~	~~F714SB004~~	resample F714SB004	4	6		SO		X										
~~714SB00503~~	~~F714SB005~~	resample F714SB005	4	6		SO		X										
~~714SB00603~~	~~F714SB006~~	resample F714SB006	4	6		SO		X										
~~717SB00403~~	~~F717SB004~~	resample F717SB004	4	6		SO		X										
~~717SB00503~~	~~F717SB005~~	resample F717SB005	4	6		SO		X										
~~717SB00603~~	~~F717SB006~~	resample F717SB006	4	6		SO		X										
~~717SB00603MS~~	~~F717SB006~~	resample F717SB006	4	6		SO		X										MS
~~717SB00603SD~~	~~F717SB006~~	resample F717SB006	4	6		SO		X										MSD
716VA0S1M3	E716VA0S1	OWS sediment			7-9-02 / 1335	SO	4	X										
712EB001M3	E712EB001				7-9-02 / 1500	SQ	3					X						EB
712TB001M3	E712TB001				7-9-02 / 1505	SQ	3					X						TB

Sampled By: Darryl Gates / Stan Eller

Date/Time: 7-9-02 / as noted

Relinquished by: Stan Eller Stan Eller Date/Time: 7-9-02 @ 1725

Additional Samplers:

Received By: Jackie Robinson Date/Time: 7-9-02 1725

Relinquished by: Date/Time

Received By: Date/Time

Shipped Via: UPS FedEx Hand Other Tracking

CH2M HILL Chain of Custody/ Laboratory Analysis Form

COC Tracking #: **ZZMSL-070502-01** page 1 of 3

Laboratory: GEL

Project Name: Charleston Navy Complex

Site Name: Zone E, F & I, multiple sites

Project Number: 158814.PM.04

TAT: 7 day

Project Manager: Tom Beisel

QA Level: level 3

Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605

ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278

Send Report To: see last page of COC

EDD: CNC format

Lab Batch/SDG:

63437%

Sample ID	Station ID	Sample Description	Depth Begin	Depth End	Date & Time Collected	Matrix	# of containers	VOCs (SW8260B) 3 - 5g Encore & 1 - 2oz jar	SVOCs (SW8270C) 1 - 4 ounce jar	Pesticides/PCBs (SW8081A/8082) 1 - 4 ounce jar	Metals * (SW6010B/ 7000 series) 1 - 4 ounce jar	VOCs (SW8260B) 3 - 40mL vial, HCl	SVOCs (SW8270C) 2 - 1L amber	Pesticides/PCBs (SW8081A/8082) 2 - 1L amber	Metals * (SW6010B/ 7000 series) 1 - 0.5L HDPE, HNO3			Comments
711VAOWSM3	I711VAOWS	OWS sediment				SO		X										
712VA0S1M3	F712VA0S1	OWS sediment				SO		X										
712SB00403	F712SB004	resample F712SB001	3	5	07/11/2002 / 1050	SO		X										
712SB00503	F712SB005	resample F712SB002	3	5	07/11/2002 / 1100	SO		X										
712SB00603	F712SB006	resample F712SB003	3	5	07/11/2002 / 1110	SO		X										
713VA0S1M3	F713VA0S1	OWS sediment				SO		X										
713SB00403	F713SB004	resample F713SB001	3	5	07/11/2002 / 0920	SO		X										
713SB00503	F713SB005	resample F713SB002	3	5	07/11/2002 / 0910	SO		X										
713SB00603	F713SB006	resample F713SB003	3	5	07/11/2002 / 0900	SO		X										
714SB00403	F714SB004	resample F714SB001	3	5	07/11/2002 / 1010	SO		X										
714CB00403	F714SB004	resample F714SB001	3	5	07/11/2002 / 1010	SO		X										
714SB00503	F714SB005	resample F714SB002	3	5	07/11/2002 / 1020	SO		X										
714SB00603	F714SB006	resample F714SB003	3	5	07/11/2002 / 1030	SO		X										
717SB00403	F717SB004	resample F717SB001	3	5	07/11/2002 / 1330	SO		X										
717SB00503	F717SB005	resample F717SB002	3	5	07/11/2002 / 1340	SO		X										
717SB00603	F717SB006	resample F717SB003	3	5	07/11/2002 / 1350	SO		X										
717SB00603MS	F717SB006	resample F717SB003	3	5	07/11/2002 / 1350	SO		X										MS
717SB00603SD	F717SB006	resample F717SB003	3	5	07/11/2002 / 1350	SO		X										MSD
716VA0S1M3	E716VA0S1	OWS sediment				SO		X										
712EB002M3	E712EB002				07/11/2002 / 1400	SQ						X						EB
712TB001M3	E712TB001				07/11/2002 / lab provided	SQ						X						TB

Sampled By Darryl Gates — Date/Time 7-11-02 / as noted

Relinquished by: Darryl Gates — Date/Time 7-11-02 / 1735

Additional Samplers:

Received By Lab: Paulette Underdell — Date/Time 7-11-02 1735

Relinquished by: — Date/Time

Received By: — Date/Time

Shipped Via: UPS FedEx Hand Other Tracking#:

Receipt Exceptions:

C020731051

CH2M HILL Chain of Custody/ Laboratory Analysis Form

COC Tracking #: **ZLE037-071602-01** page 1 of 2

Laboratory: GEL

Project Name: Charleston Navy Complex

Site Name: Zone L, AOC 716 - Bldg 1024

Project Number: 158814.PM.04

TAT: standard

Project Manager: Tom Beisel

QA Level: level 3

Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605

ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278

Send Report To: see last page of COC

EDD: CNC format

Lab Batch/SDG: 64902%

64902%

Sample ID	Station ID	Sample Description	Depth Begin	Depth End	Date & Time Collected	Matrix	# of containers	VOCs (SW8260B) 3 - 5g Encore & 1 - 2oz jar	SVOCs (SW8270C) 1 - 4 ounce jar	Pesticides/PCBs (SW8081A/8082) 1 - 4 ounce jar	Metals * (SW6010B/ 7000 series) 1 - 4 ounce jar	VOCs (SW8260B) 3 - 40mL vial, HCl	SVOCs (SW8270C) 2 - 1L amber	Pesticides/PCBs (SW8081A/8082) 2 - 1L amber	Metals * (SW6010B/ 7000 series) 1 - 0.5L HDPE, HNO3			Comments	
037GW001M2	LE037GW001				8-5-02/1435	GW	8					X	X	X	X				3
037EW001M2	LE037EW001				8-5-02/1440	WQ	8					X	X	X	X			EB	2
037TW001M2	LE039TW001				LAB Supplied	WQ	3					X						TB	1

RCRA

Samples complete

Sampled By: Andrew O'Connor

Date/Time: 8-5-02

Relinquished by: [signature]

Date/Time: 8-5-02/1230

Additional Samplers: J. Peas

Received By Lab: [signature]

Date/Time: 8-6-02 1230

Relinquished by:

Date/Time

Rece[illegible] Exceptions:

Appendix E

CH2MHILL

PROJECT NUMBER	DPT NUMBER	
158814	F713GP001	page 1 of 1

DPT GROUNDWATER SAMPLE LOG

PROJECT : Charleston Naval Complex, Charleston, SC **LOCATION :** Charleston, SC **NORTHING:** 374280.1

ELEVATION : NA **DRILLING CONTRACTOR :** Prosonic Corporation License # 1435 **EASTING:** 2319321.6

DRILLING METHOD AND EQUIPMENT USED : Geoprobe Direct-Push Sampling, 4 ft screen

START : 06/11/2002 **END:** 06/11/2002 **LOGGER :** D. Gates/NVR

DEPTH BELOW SURFACE (FT)	SAMPLING DEPTH SCREEN INTERVAL	COMMENTS ABANDONMENT METHOD TESTS, INSTRUMENTATION SOIL DESCRIPTION, IF VISIBLE
5		
10		
15		
	Top of Sampling Interval	
20		
	Bottom of Sampling Interval	After sampling the boring was pressure grouted from bottom to top with Type 1 Portland Cement
25		
30		

CH2MHILL

PROJECT NUMBER	DPT NUMBER	
158814	F713GP002	page 1 of 1

DPT GROUNDWATER SAMPLE LOG

PROJECT : Charleston Naval Complex, Charleston, SC **LOCATION :** Charleston, SC **NORTHING:** 374288.4

ELEVATION : NA **DRILLING CONTRACTOR :** Prosonic Corporation License # 1435 **EASTING:** 2319308.6

DRILLING METHOD AND EQUIPMENT USED : Geoprobe Direct-Push Sampling, 4 ft screen

START : 06/11/2002 **END:** 06/11/2002 **LOGGER :** D. Gates/NVR

DEPTH BELOW SURFACE (FT)	SAMPLING DEPTH SCREEN INTERVAL	COMMENTS ABANDONMENT METHOD TESTS, INSTRUMENTATION SOIL DESCRIPTION, IF VISIBLE
5		
10		
15		
	Top of Sampling Interval	
20		
	Bottom of Sampling Interval	After sampling the boring was pressure grouted from bottom to top with Type 1 Portland Cement
25		
30		

CH2MHILL

PROJECT NUMBER	DPT NUMBER	
158814	F713GP003	page 1 of 1

DPT GROUNDWATER SAMPLE LOG

PROJECT : Charleston Naval Complex, Charleston, SC **LOCATION :** Charleston, SC **NORTHING:** 374280.7

ELEVATION : NA **DRILLING CONTRACTOR :** Prosonic Corporation License # 1435 **EASTING:** 2319304.6

DRILLING METHOD AND EQUIPMENT USED : Geoprobe Direct-Push Sampling, 4 ft screen

START : 06/11/2002 **END:** 06/11/2002 **LOGGER :** D. Gates/NVR

DEPTH BELOW SURFACE (FT)	SAMPLING DEPTH SCREEN INTERVAL	COMMENTS ABANDONMENT METHOD TESTS, INSTRUMENTATION SOIL DESCRIPTION, IF VISIBLE
5		
10		
15		
	Top of Sampling Interval	
20		
	Bottom of Sampling Interval	After sampling the boring was pressure grouted from bottom to top with Type 1 Portland Cement
25		
30		

Appendix F

VOCs, OWS Water
AOC 716

	StationID	E716ZAOS1	
	SampleID	716ZAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/11/2002	
	DateAnalyzed	6/11/2002	
	SDGNumber	61560	
Parameter	**Units**		
Chloromethane	ug/L	10	U
Vinyl chloride	ug/L	10	U
Bromomethane	ug/L	10	U
Chloroethane	ug/L	10	U
1,1-Dichloroethene	ug/L	5	U
Acetone	ug/L	10	U
Carbon Disulfide	ug/L	5	U
Methylene Chloride	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U
1,1-Dichloroethane	ug/L	5	U
Vinyl acetate	ug/L	10	U
Methyl ethyl ketone (2-Butanone)	ug/L	10	U
cis-1,2-Dichloroethylene	ug/L	5	U
1,2-Dichloroethene (total)	ug/L	5	U
Chloroform	ug/L	5	U
1,1,1-Trichloroethane	ug/L	5	U
Carbon Tetrachloride	ug/L	5	U
1,2-Dichloroethane	ug/L	5	U
Benzene	ug/L	5	U
Trichloroethylene (TCE)	ug/L	5	U
1,2-Dichloropropane	ug/L	5	U
Bromodichloromethane	ug/L	5	U
2-Chloroethyl vinyl ether	ug/L	5	R
cis-1,3-Dichloropropene	ug/L	5	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/L	10	U
Toluene	ug/L	5	U
trans-1,3-Dichloropropene	ug/L	5	U
1,1,2-Trichloroethane	ug/L	5	U
2-Hexanone	ug/L	10	U
Tetrachloroethylene (PCE)	ug/L	5	U
Dibromochloromethane	ug/L	5	U
Chlorobenzene	ug/L	5	U
Ethylbenzene	ug/L	5	U
m+p Xylene	ug/L	5	U
o-Xylene	ug/L	5	U
Xylenes, Total	ug/L	5	U
Styrene	ug/L	5	U
Bromoform	ug/L	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U
1,3-Dichlorobenzene	ug/L	5	UJ
1,4-Dichlorobenzene	ug/L	5	U
1,2-Dichlorobenzene	ug/L	5	U
1,2,4-Trichlorobenzene	ug/L	5	U
1,2,3-Trichlorobenzene	ug/L	5	UJ

SVOCs, OWS Water
AOC 716

	StationID	E716ZAOS1	
	SampleID	716ZAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/6/2002	
	DateAnalyzed	6/7/2002	
	SDGNumber	61560	
Parameter	**Units**		
Phenol	ug/L	9.7	U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/L	9.7	U
2-Chlorophenol	ug/L	9.7	U
1,3-Dichlorobenzene	ug/L	9.7	U
1,4-Dichlorobenzene	ug/L	9.7	U
Benzyl alcohol	ug/L	9.7	U
1,2-Dichlorobenzene	ug/L	9.7	U
Bis(2-Chloroisopropyl)Ether	ug/L	9.7	U
2-Methylphenol (o-Cresol)	ug/L	9.7	U
N-Nitrosodi-n-propylamine	ug/L	9.7	U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/L	9.7	U
Hexachloroethane	ug/L	9.7	U
Nitrobenzene	ug/L	9.7	U
Isophorone	ug/L	9.7	U
2-Nitrophenol	ug/L	9.7	U
2,4-Dimethylphenol	ug/L	9.7	U
bis(2-Chloroethoxy) Methane	ug/L	9.7	U
2,4-Dichlorophenol	ug/L	9.7	U
Benzoic acid	ug/L	10.7	J
1,2,4-Trichlorobenzene	ug/L	9.7	U
Naphthalene	ug/L	9.7	U
4-Chloroaniline	ug/L	9.7	U
Hexachlorobutadiene	ug/L	9.7	U
4-Chloro-3-methylphenol	ug/L	9.7	U
2-Methylnaphthalene	ug/L	9.7	U
Hexachlorocyclopentadiene	ug/L	9.7	U
2,4,6-Trichlorophenol	ug/L	9.7	U
2,4,5-Trichlorophenol	ug/L	48.5	U
2-Chloronaphthalene	ug/L	9.7	U
2-Nitroaniline	ug/L	48.5	U
3-Nitroaniline	ug/L	48.5	U
Dimethyl Phthalate	ug/L	9.7	U
2,6-Dinitrotoluene	ug/L	9.7	U
Acenaphthylene	ug/L	9.7	U
Acenaphthene	ug/L	9.7	U
2,4-Dinitrophenol	ug/L	48.5	U
Dibenzofuran	ug/L	9.7	U
2,4-Dinitrotoluene	ug/L	9.7	U
Diethyl Phthalate	ug/L	9.7	U
4-Nitrophenol	ug/L	48.5	U
Fluorene	ug/L	9.7	U
4-Chlorophenyl Phenyl Ether	ug/L	9.7	U
4,6-Dinitro-2-methylphenol	ug/L	48.5	U
4-Nitroaniline	ug/L	48.5	U
Diphenylamine	ug/L	9.7	U

SVOCs, OWS Water
AOC 716

	StationID	E716ZAOS1	
	SampleID	716ZAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/6/2002	
	DateAnalyzed	6/7/2002	
	SDGNumber	61560	
Parameter	**Units**		
4-Bromophenyl Phenyl Ether	ug/L	9.7	U
Hexachlorobenzene	ug/L	9.7	U
Pentachlorophenol	ug/L	48.5	U
Phenanthrene	ug/L	9.7	U
Anthracene	ug/L	9.7	U
Di-n-butyl Phthalate	ug/L	9.7	U
Fluoranthene	ug/L	9.7	U
Pyrene	ug/L	9.7	U
Benzyl Butyl Phthalate	ug/L	9.7	U
Benzo(a)Anthracene	ug/L	9.7	U
3,3'-Dichlorobenzidine	ug/L	19.4	U
Chrysene	ug/L	9.7	U
bis(2-Ethylhexyl) Phthalate	ug/L	9.7	U
Di-n-octylphthalate	ug/L	9.7	U
Benzo(b)Fluoranthene	ug/L	9.7	U
Benzo(k)Fluoranthene	ug/L	9.7	U
Benzo(a)Pyrene	ug/L	0.97	U
Indeno(1,2,3-c,d)pyrene	ug/L	9.7	U
Dibenz(a,h)anthracene	ug/L	9.7	U
Benzo(g,h,i)Perylene	ug/L	9.7	U
Carbazole	ug/L	9.7	U

Pesticides, OWS Water
AOC 716

	StationID	E716ZAOS1	
	SampleID	716ZAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/7/2002	
	DateAnalyzed	6/12/2002	
	SDGNumber	61560	
Parameter	**Units**		
Aldrin	ug/L	0.04	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/L	0.04	U
Alpha-chlordane	ug/L	0.04	U
Beta BHC (Beta Hexachlorocyclohexane)	ug/L	0.04	U
Chlordane	ug/L	0.4	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/L	0.04	U
Dieldrin	ug/L	0.08	U
Endosulfan I	ug/L	0.04	U
Endosulfan II	ug/L	0.08	U
Endosulfan Sulfate	ug/L	0.08	U
Endrin Aldehyde	ug/L	0.08	U
Endrin Ketone	ug/L	0.08	U
Endrin	ug/L	0.08	U
Gamma BHC (Lindane)	ug/L	0.04	U
Gamma-chlordane	ug/L	0.04	U
Heptachlor Epoxide	ug/L	0.04	U
Heptachlor	ug/L	0.04	U
Methoxychlor	ug/L	0.38	U
p,p'-DDD	ug/L	0.08	U
p,p'-DDE	ug/L	0.08	U
p,p'-DDT	ug/L	0.08	U
Toxaphene	ug/L	2.5	U

PCBs, OWS Water
AOC 716

	StationID	E716ZAOS1	
	SampleID	716ZAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/7/2002	
	DateAnalyzed	6/10/2002	
	SDGNumber	61560	
Parameter	**Units**		
PCB-1016 (Arochlor 1016)	ug/L	1	U
PCB-1221 (Arochlor 1221)	ug/L	1	U
PCB-1232 (Arochlor 1232)	ug/L	1	U
PCB-1242 (Arochlor 1242)	ug/L	1	U
PCB-1248 (Arochlor 1248)	ug/L	1	U
PCB-1254 (Arochlor 1254)	ug/L	2	U
PCB-1260 (Arochlor 1260)	ug/L	2	U

Metals, OWS Water AOC 716	StationID	E716ZAOS1		E716ZAOS1	
	SampleID	716ZAOS1M1		716ZAOS1M1	
	DateCollected	6/5/2002		6/5/2002	
	DateExtracted	6/13/2002		6/18/2002	
	DateAnalyzed	6/14/2002		6/18/2002	
	SDGNumber	61560		61560	
Parameter	**Units**				
Aluminum	ug/L			110	J
Antimony	ug/L			4.79	U
Arsenic	ug/L			3.97	U
Barium	ug/L			246	=
Beryllium	ug/L			0.185	U
Cadmium	ug/L			0.495	U
Calcium	ug/L			42000	=
Chromium, Total	ug/L			1.68	J
Cobalt	ug/L			0.581	U
Copper	ug/L			72.6	=
Iron	ug/L			1520	=
Lead	ug/L			10.6	=
Magnesium	ug/L			2210	J
Manganese	ug/L			144	=
Nickel	ug/L			3.82	J
Potassium	ug/L			3280	J
Selenium	ug/L			2.94	J
Silver	ug/L			1.15	U
Sodium	ug/L			5780	=
Thallium	ug/L			4.99	U
Vanadium	ug/L			1.58	J
Zinc	ug/L			225	=
Mercury	ug/L	0.04	U		

VOCs, OWS Sediments
AOC 716

	StationID	E716VA0S1	
	SampleID	716VA0S1M3	
	DateCollected	7/9/2002	
	DateExtracted	7/12/2002	
	DateAnalyzed	7/12/2002	
	SDGNumber	63281	
Parameter	**Units**		
Chloromethane	ug/kg	18.6	U
Vinyl chloride	ug/kg	18.6	U
Bromomethane	ug/kg	18.6	U
Chloroethane	ug/kg	18.6	U
1,1-Dichloroethene	ug/kg	9.3	U
Acetone	ug/kg	41.6	J
Carbon Disulfide	ug/kg	9.3	U
Methylene Chloride	ug/kg	9.3	U
trans-1,2-Dichloroethene	ug/kg	9.3	U
1,1-Dichloroethane	ug/kg	9.3	U
Vinyl acetate	ug/kg	18.6	UJ
Methyl ethyl ketone (2-Butanone)	ug/kg	11.1	J
cis-1,2-Dichloroethylene	ug/kg	9.3	U
1,2-Dichloroethene (total)	ug/kg	9.3	U
Chloroform	ug/kg	9.3	U
1,1,1-Trichloroethane	ug/kg	9.3	U
Carbon Tetrachloride	ug/kg	9.3	U
1,2-Dichloroethane	ug/kg	9.3	U
Benzene	ug/kg	9.3	U
Trichloroethylene (TCE)	ug/kg	9.3	U
1,2-Dichloropropane	ug/kg	9.3	U
Bromodichloromethane	ug/kg	9.3	U
2-Chloroethyl vinyl ether	ug/kg	18.6	UJ
cis-1,3-Dichloropropene	ug/kg	9.3	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	18.6	U
Toluene	ug/kg	3.8	J
trans-1,3-Dichloropropene	ug/kg	9.3	U
1,1,2-Trichloroethane	ug/kg	9.3	U
2-Hexanone	ug/kg	18.6	U
Tetrachloroethylene (PCE)	ug/kg	9.3	U
Dibromochloromethane	ug/kg	9.3	U
Chlorobenzene	ug/kg	9.3	U
Ethylbenzene	ug/kg	2.7	J
m+p Xylene	ug/kg	10.9	=
o-Xylene	ug/kg	7.4	J
Xylenes, Total	ug/kg	18.3	=
Styrene	ug/kg	9.3	U
Bromoform	ug/kg	9.3	U
1,1,2,2-Tetrachloroethane	ug/kg	9.3	U
1,3-Dichlorobenzene	ug/kg	9.3	U
1,4-Dichlorobenzene	ug/kg	9.3	U
1,2-Dichlorobenzene	ug/kg	9.3	U
1,2,4-Trichlorobenzene	ug/kg	9.3	U
1,2,3-Trichlorobenzene	ug/kg	9.3	U

VOCs, OWS Sediments
AOC 716

	StationID	E716VAOS1	
	SampleID	716VAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/12/2002	
	DateAnalyzed	6/12/2002	
	SDGNumber	61559	
Parameter	**Units**		
Chloromethane	ug/kg	15.5	SUJ
Vinyl chloride	ug/kg	15.5	SUJ
Bromomethane	ug/kg	15.5	SUJ
Chloroethane	ug/kg	15.5	SUJ
1,1-Dichloroethene	ug/kg	7.8	SUJ
Acetone	ug/kg	70.6	SJ
Carbon Disulfide	ug/kg	7.8	SUJ
Methylene Chloride	ug/kg	7.8	SUJ
trans-1,2-Dichloroethene	ug/kg	7.8	SUJ
1,1-Dichloroethane	ug/kg	7.8	SUJ
Vinyl acetate	ug/kg	15.5	SUJ
Methyl ethyl ketone (2-Butanone)	ug/kg	16.7	SJ
cis-1,2-Dichloroethylene	ug/kg	7.8	SUJ
1,2-Dichloroethene (total)	ug/kg	7.8	SUJ
Chloroform	ug/kg	7.8	SUJ
1,1,1-Trichloroethane	ug/kg	7.8	SUJ
Carbon Tetrachloride	ug/kg	7.8	SUJ
1,2-Dichloroethane	ug/kg	7.8	SUJ
Benzene	ug/kg	7.8	SUJ
Trichloroethylene (TCE)	ug/kg	7.8	SUJ
1,2-Dichloropropane	ug/kg	7.8	SUJ
Bromodichloromethane	ug/kg	7.8	SUJ
2-Chloroethyl vinyl ether	ug/kg	15.5	SUJ
cis-1,3-Dichloropropene	ug/kg	7.8	SUJ
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	7.8	SUJ
Toluene	ug/kg	2.7	SJ
trans-1,3-Dichloropropene	ug/kg	7.8	SUJ
1,1,2-Trichloroethane	ug/kg	7.8	SUJ
2-Hexanone	ug/kg	15.5	SUJ
Tetrachloroethylene (PCE)	ug/kg	0.73	SJ
Dibromochloromethane	ug/kg	7.8	SUJ
Chlorobenzene	ug/kg	7.8	SUJ
Ethylbenzene	ug/kg	1.6	SJ
m+p Xylene	ug/kg	7.2	SJ
o-Xylene	ug/kg	6.6	SJ
Xylenes, Total	ug/kg	13.7	SJ
Styrene	ug/kg	7.8	SUJ
Bromoform	ug/kg	7.8	SUJ
1,1,2,2-Tetrachloroethane	ug/kg	7.8	SUJ
1,3-Dichlorobenzene	ug/kg	7.8	SUJ
1,4-Dichlorobenzene	ug/kg	7.8	SUJ
1,2-Dichlorobenzene	ug/kg	7.8	SUJ
1,2,4-Trichlorobenzene	ug/kg	7.8	SUJ
1,2,3-Trichlorobenzene	ug/kg	7.8	SUJ

SVOCs, OWS Sediments
AOC 716

	StationID	E716VAOS1	
	SampleID	716VAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/7/2002	
	DateAnalyzed	6/8/2002	
	SDGNumber	61559	
Parameter	**Units**		
Benzo(g,h,i)Perylene	ug/kg	503	UJ
Phenol	ug/kg	503	UJ
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/kg	503	U
Bis(2-Chloroisopropyl)Ether	ug/kg	503	U
2-Chlorophenol	ug/kg	503	U
1,4-Dichlorobenzene	ug/kg	503	UJ
Benzyl alcohol	ug/kg	503	U
1,2-Dichlorobenzene	ug/kg	503	U
1,3-Dichlorobenzene	ug/kg	503	U
2-Methylphenol (o-Cresol)	ug/kg	503	U
N-Nitrosodi-n-propylamine	ug/kg	503	UJ
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/kg	503	U
Hexachloroethane	ug/kg	503	U
Nitrobenzene	ug/kg	503	U
Isophorone	ug/kg	503	U
2-Nitrophenol	ug/kg	503	U
2,4-Dimethylphenol	ug/kg	503	U
bis(2-Chloroethoxy) Methane	ug/kg	503	U
2,4-Dichlorophenol	ug/kg	503	U
Benzoic acid	ug/kg	2440	UJ
1,2,4-Trichlorobenzene	ug/kg	503	U
Naphthalene	ug/kg	503	U
4-Chloroaniline	ug/kg	503	U
Hexachlorobutadiene	ug/kg	503	U
4-Chloro-3-methylphenol	ug/kg	457	U
2-Methylnaphthalene	ug/kg	56.8	J
Hexachlorocyclopentadiene	ug/kg	503	UJ
2,4,6-Trichlorophenol	ug/kg	503	U
2,4,5-Trichlorophenol	ug/kg	2440	U
2-Chloronaphthalene	ug/kg	503	U
2-Nitroaniline	ug/kg	503	U
3-Nitroaniline	ug/kg	2440	U
Dimethyl Phthalate	ug/kg	162	J
2,6-Dinitrotoluene	ug/kg	503	U
Acenaphthylene	ug/kg	503	U
Acenaphthene	ug/kg	21.2	J
2,4-Dinitrophenol	ug/kg	2440	U
Dibenzofuran	ug/kg	503	U
2,4-Dinitrotoluene	ug/kg	457	U
Diethyl Phthalate	ug/kg	503	U
4-Nitrophenol	ug/kg	2440	U
Fluorene	ug/kg	23.7	J
4-Chlorophenyl Phenyl Ether	ug/kg	503	U
4,6-Dinitro-2-methylphenol	ug/kg	2440	U
4-Nitroaniline	ug/kg	2440	U

SVOCs, OWS Sediments
AOC 716

	StationID	E716VAOS1	
	SampleID	716VAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/7/2002	
	DateAnalyzed	6/8/2002	
	SDGNumber	61559	
Parameter	**Units**		
Diphenylamine	ug/kg	503	U
4-Bromophenyl Phenyl Ether	ug/kg	503	U
Hexachlorobenzene	ug/kg	503	U
Pentachlorophenol	ug/kg	2440	U
Phenanthrene	ug/kg	158	J
Anthracene	ug/kg	503	U
Di-n-butyl Phthalate	ug/kg	503	U
Fluoranthene	ug/kg	256	J
Pyrene	ug/kg	201	J
Benzyl Butyl Phthalate	ug/kg	1200	=
Benzo(a)Anthracene	ug/kg	93.7	J
3,3'-Dichlorobenzidine	ug/kg	1000	U
Chrysene	ug/kg	145	J
bis(2-Ethylhexyl) Phthalate	ug/kg	2090	=
Di-n-octylphthalate	ug/kg	503	U
Benzo(b)Fluoranthene	ug/kg	209	J
Benzo(k)Fluoranthene	ug/kg	503	U
Benzo(a)Pyrene	ug/kg	168	J
Indeno(1,2,3-c,d)pyrene	ug/kg	503	UJ
Dibenz(a,h)anthracene	ug/kg	503	UJ
Carbazole	ug/kg	503	U

Pesticides, OWS Sediments
AOC 716

	StationID	E716VAOS1	
	SampleID	716VAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/7/2002	
	DateAnalyzed	6/13/2002	
	SDGNumber	61559	
Parameter	**Units**		
Aldrin	ug/kg	9.9	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/kg	9.9	U
Alpha-chlordane	ug/kg	9.9	U
Beta BHC (Beta Hexachlorocyclohexane)	ug/kg	9.9	U
Chlordane	ug/kg	98.7	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/kg	9.9	U
Dieldrin	ug/kg	19	U
Endosulfan I	ug/kg	9.9	U
Endosulfan II	ug/kg	19	U
Endosulfan Sulfate	ug/kg	19	U
Endrin Aldehyde	ug/kg	19	U
Endrin Ketone	ug/kg	19	U
Endrin	ug/kg	19	U
Gamma BHC (Lindane)	ug/kg	9.9	U
Gamma-chlordane	ug/kg	9.9	U
Heptachlor Epoxide	ug/kg	9.9	U
Heptachlor	ug/kg	9.9	U
Methoxychlor	ug/kg	98.7	U
p,p'-DDD	ug/kg	19	U
p,p'-DDE	ug/kg	19	U
p,p'-DDT	ug/kg	19	U
Toxaphene	ug/kg	631	U

PCBs, OWS Sediments AOC 716	StationID	E716VAOS1	
	SampleID	716VAOS1M1	
	DateCollected	6/5/2002	
	DateExtracted	6/7/2002	
	DateAnalyzed	6/10/2002	
	SDGNumber	61559	
Parameter	**Units**		
PCB-1016 (Arochlor 1016)	ug/kg	251	U
PCB-1221 (Arochlor 1221)	ug/kg	251	U
PCB-1232 (Arochlor 1232)	ug/kg	251	U
PCB-1242 (Arochlor 1242)	ug/kg	208	J
PCB-1248 (Arochlor 1248)	ug/kg	251	U
PCB-1254 (Arochlor 1254)	ug/kg	141	J
PCB-1260 (Arochlor 1260)	ug/kg	369	J

Metals, OWS Sediments AOC 716	StationID	E716VAOS1		E716VAOS1	
	SampleID	716VAOS1M1		716VAOS1M1	
	DateCollected	6/5/2002		6/5/2002	
	DateExtracted	6/12/2002		6/17/2002	
	DateAnalyzed	6/13/2002		6/19/2002	
	SDGNumber	61559		61559	
Parameter	**Units**				
Aluminum	mg/kg			2280	=
Antimony	mg/kg			1.36	J
Arsenic	mg/kg			1.97	J
Barium	mg/kg			65.1	J
Beryllium	mg/kg			0.144	U
Cadmium	mg/kg			1.45	U
Calcium	mg/kg			11100	=
Chromium, Total	mg/kg			103	J
Cobalt	mg/kg			3.39	J
Copper	mg/kg			357	=
Iron	mg/kg			17000	=
Lead	mg/kg			293	=
Magnesium	mg/kg			1370	J
Manganese	mg/kg			165	=
Nickel	mg/kg			25.5	J
Potassium	mg/kg			419	J
Selenium	mg/kg			0.433	J
Silver	mg/kg			0.572	J
Sodium	mg/kg			62.8	J
Thallium	mg/kg			0.73	U
Vanadium	mg/kg			11	J
Zinc	mg/kg			3360	=
Mercury	mg/kg	0.314	J		

Metals, Groundwater AOC 716	StationID	LE037GW001		LE037GW001	
	SampleID	037GW001M2		037GW001M2	
	DateCollected	8/5/2002		8/5/2002	
	DateExtracted	8/9/2002		8/9/2002	
	DateAnalyzed	8/21/2002		8/12/2002	
	SDGNumber	64902		64902	
Parameter	**Units**				
Aluminum	ug/L	843	=		
Antimony	ug/L	4.79	U		
Arsenic	ug/L	15.6	=		
Barium	ug/L	27.3	J		
Beryllium	ug/L	0.185	U		
Cadmium	ug/L	0.21	U		
Calcium	ug/L	150000	=		
Chromium, Total	ug/L	2.1	J		
Cobalt	ug/L	0.581	U		
Copper	ug/L	11.6	J		
Iron	ug/L	4590	=		
Lead	ug/L	5.42	U		
Magnesium	ug/L	34500	=		
Manganese	ug/L	578	=		
Nickel	ug/L	9.95	J		
Potassium	ug/L	19200	=		
Selenium	ug/L	2.67	U		
Silver	ug/L	1.15	U		
Sodium	ug/L	147000	=		
Thallium	ug/L	4.99	U		
Vanadium	ug/L	2.36	J		
Zinc	ug/L	81.9	=		
Mercury	ug/L			0.071	U

PCBs, Groundwater AOC 716	StationID	LE037GW001	
	SampleID	037GW001M2	
	DateCollected	8/5/2002	
	DateExtracted	8/8/2002	
	DateAnalyzed	8/12/2002	
	SDGNumber	64902	
Parameter	**Units**		
PCB-1016 (Arochlor 1016)	ug/L	1	U
PCB-1221 (Arochlor 1221)	ug/L	1	U
PCB-1232 (Arochlor 1232)	ug/L	1	U
PCB-1242 (Arochlor 1242)	ug/L	1	U
PCB-1248 (Arochlor 1248)	ug/L	1	U
PCB-1254 (Arochlor 1254)	ug/L	2	U
PCB-1260 (Arochlor 1260)	ug/L	2	U

Pesticides, Groundwater
AOC 716

	StationID	LE037GW001	
	SampleID	037GW001M2	
	DateCollected	8/5/2002	
	DateExtracted	8/8/2002	
	DateAnalyzed	8/12/2002	
	SDGNumber	64902	
Parameter	**Units**		
Aldrin	ug/L	0.044	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/L	0.044	U
Alpha-chlordane	ug/L	0.044	U
Beta BHC (Beta Hexachlorocyclohexane)	ug/L	0.044	U
Chlordane	ug/L	0.44	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/L	0.044	U
Dieldrin	ug/L	0.088	U
Endosulfan I	ug/L	0.044	U
Endosulfan II	ug/L	0.088	U
Endosulfan Sulfate	ug/L	0.088	U
Endrin Aldehyde	ug/L	0.088	U
Endrin Ketone	ug/L	0.088	U
Endrin	ug/L	0.088	U
Gamma BHC (Lindane)	ug/L	0.044	U
Gamma-chlordane	ug/L	0.044	U
Heptachlor Epoxide	ug/L	0.044	U
Heptachlor	ug/L	0.044	U
Methoxychlor	ug/L	0.42	U
p,p'-DDD	ug/L	0.088	U
p,p'-DDE	ug/L	0.088	U
p,p'-DDT	ug/L	0.088	U
Toxaphene	ug/L	2.7	U

SVOCs, Groundwater
AOC 716

	StationID	LE037GW001	
	SampleID	037GW001M2	
	DateCollected	8/5/2002	
	DateExtracted	8/8/2002	
	DateAnalyzed	8/9/2002	
	SDGNumber	64902	
Parameter	**Units**		
Phenol	ug/L	10.2	U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/L	10.2	U
2-Chlorophenol	ug/L	10.2	U
Benzyl alcohol	ug/L	10.2	U
Bis(2-Chloroisopropyl)Ether	ug/L	10.2	U
2-Methylphenol (o-Cresol)	ug/L	10.2	U
N-Nitrosodi-n-propylamine	ug/L	10.2	U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/L	10.2	U
Hexachloroethane	ug/L	10.2	U
Nitrobenzene	ug/L	10.2	U
Isophorone	ug/L	10.2	U
2-Nitrophenol	ug/L	10.2	U
2,4-Dimethylphenol	ug/L	10.2	U
bis(2-Chloroethoxy) Methane	ug/L	10.2	U
2,4-Dichlorophenol	ug/L	10.2	U
Benzoic acid	ug/L	51	U
Naphthalene	ug/L	10.2	U
4-Chloroaniline	ug/L	10.2	U
Hexachlorobutadiene	ug/L	10.2	U
4-Chloro-3-methylphenol	ug/L	10.2	U
2-Methylnaphthalene	ug/L	10.2	U
Hexachlorocyclopentadiene	ug/L	10.2	UJ
2,4,6-Trichlorophenol	ug/L	10.2	U
2,4,5-Trichlorophenol	ug/L	51	U
2-Chloronaphthalene	ug/L	10.2	U
2-Nitroaniline	ug/L	51	U
3-Nitroaniline	ug/L	51	U
Dimethyl Phthalate	ug/L	10.2	U
2,6-Dinitrotoluene	ug/L	10.2	U
Acenaphthylene	ug/L	10.2	U
Acenaphthene	ug/L	10.2	U
2,4-Dinitrophenol	ug/L	51	UJ
Dibenzofuran	ug/L	10.2	U
2,4-Dinitrotoluene	ug/L	10.2	U
Diethyl Phthalate	ug/L	10.2	U
4-Nitrophenol	ug/L	51	U
Fluorene	ug/L	10.2	U
4-Chlorophenyl Phenyl Ether	ug/L	10.2	U
4,6-Dinitro-2-methylphenol	ug/L	51	U
4-Nitroaniline	ug/L	51	U
Diphenylamine	ug/L	10.2	U
4-Bromophenyl Phenyl Ether	ug/L	10.2	U
Hexachlorobenzene	ug/L	10.2	U
Pentachlorophenol	ug/L	51	U
Phenanthrene	ug/L	10.2	U

SVOCs, Groundwater
AOC 716

	StationID	LE037GW001	
	SampleID	037GW001M2	
	DateCollected	8/5/2002	
	DateExtracted	8/8/2002	
	DateAnalyzed	8/9/2002	
	SDGNumber	64902	
Parameter	**Units**		
Anthracene	ug/L	10.2	U
Di-n-butyl Phthalate	ug/L	10.2	U
Fluoranthene	ug/L	10.2	U
Pyrene	ug/L	10.2	U
Benzyl Butyl Phthalate	ug/L	10.2	U
Benzo(a)Anthracene	ug/L	10.2	U
3,3'-Dichlorobenzidine	ug/L	20.4	U
Chrysene	ug/L	10.2	U
bis(2-Ethylhexyl) Phthalate	ug/L	10.2	U
Di-n-octylphthalate	ug/L	10.2	U
Benzo(b)Fluoranthene	ug/L	10.2	U
Benzo(k)Fluoranthene	ug/L	10.2	U
Benzo(a)Pyrene	ug/L	1	U
Indeno(1,2,3-c,d)pyrene	ug/L	10.2	U
Dibenz(a,h)anthracene	ug/L	10.2	U
Benzo(g,h,i)Perylene	ug/L	10.2	U
Carbazole	ug/L	10.2	U

VOCs, Groundwater
AOC 716

	StationID	LE037GW001	
	SampleID	037GW001M2	
	DateCollected	8/5/2002	
	DateExtracted	8/9/2002	
	DateAnalyzed	8/9/2002	
	SDGNumber	64902	
Parameter	**Units**		
Chloromethane	ug/L	10	U
Vinyl chloride	ug/L	10	U
Bromomethane	ug/L	10	U
Chloroethane	ug/L	10	U
1,1-Dichloroethene	ug/L	5	U
Acetone	ug/L	10	U
Carbon Disulfide	ug/L	5	U
Methylene Chloride	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U
1,1-Dichloroethane	ug/L	0.7	J
Vinyl acetate	ug/L	10	UJ
Methyl ethyl ketone (2-Butanone)	ug/L	10	U
cis-1,2-Dichloroethylene	ug/L	2.7	J
1,2-Dichloroethene (total)	ug/L	2.7	J
Chloroform	ug/L	5	U
1,1,1-Trichloroethane	ug/L	5	U
Carbon Tetrachloride	ug/L	5	U
1,2-Dichloroethane	ug/L	5	U
Benzene	ug/L	5	U
Trichloroethylene (TCE)	ug/L	0.8	J
1,2-Dichloropropane	ug/L	5	U
Bromodichloromethane	ug/L	5	U
2-Chloroethyl vinyl ether	ug/L	10	UJ
cis-1,3-Dichloropropene	ug/L	5	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/L	10	U
Toluene	ug/L	0.51	J
trans-1,3-Dichloropropene	ug/L	5	U
1,1,2-Trichloroethane	ug/L	5	U
2-Hexanone	ug/L	10	U
Tetrachloroethylene (PCE)	ug/L	5	U
Dibromochloromethane	ug/L	5	U
Chlorobenzene	ug/L	5	U
Ethylbenzene	ug/L	5	U
m+p Xylene	ug/L	5	U
o-Xylene	ug/L	5	U
Xylenes, Total	ug/L	5	U
Styrene	ug/L	5	U
Bromoform	ug/L	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U
1,3-Dichlorobenzene	ug/L	5	U
1,4-Dichlorobenzene	ug/L	5	U
1,2-Dichlorobenzene	ug/L	5	U
1,2,4-Trichlorobenzene	ug/L	5	U
1,2,3-Trichlorobenzene	ug/L	5	U