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COMPLETION REPORT FOR BUILDING 1279 TIER I ASSESSMENT CNC CHARLESTON SC

1/1/2005

ADVENT ENVIRONMENTAL INC

COMPLETION REPORT

BUILDING 1279 TIER I ASSESSMENT
CHARLESTON NAVAL COMPLEX, SOUTH CAROLINA

Prepared for:

Naval Facilities Engineering Command
North Charleston, South Carolina

Contract Number
N62467-04-M-0124

Prepared By:

ADVENT Environmental, Inc.
498 Wando Park Blvd.
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January 2005
ADVENT 04-511

FOREWARD

Building 1279, located on the former Charleston Naval Base now referred to as the Charleston Naval Complex (CNC) was used as a fueling station for base equipment. Building 1279 was torn down by the base prior to its closing in 1996. There are no known Underground Storage Tanks associated with the building remaining.

ADVENT Environmental Inc. (ADVENT) was contracted to conduct the TIER I, as approved by NAVFAC. The work completed included the collection of eight (8) soil borings and installation of three permanent ground-water monitoring wells. Following installation of the monitoring wells, the wells were developed and sampled for targeted parameters. Samples were sent to a certified laboratory and tested for constituents as required by the DHEC guidance document dated March 15, 2000. Investigation derived wastes (IDW) including soil, and PPE were stored in 55 gallon containers. IDW such as decontamination water, development water, and purge water generated during implementation were also stored in 55-gallon drums.

Analytical data from the Tier I indicates that ground-water is above the Risk Based Screening Levels (RBSL) in Monitoring Wells 1279GW007 and 1279GW009. Naphthalene levels for 1279GW007 were at 57ug/L and Benzene levels for 1279GW009 were at 10ug/L. Although naphthalene levels were above the RBSLs for 1279GW007 using the 8260 laboratory method, it should be noted that the naphthalene levels were below the RBSLs using the 8270 laboratory method.

Of the eight soil samples colleted, six samples (SB002 thru SB007) had levels of contaminates above the RBSLs. For soil samples SB003 thru SB006, naphthalene levels were above the RBSLs when analyzed for laboratory method 8260 and below the RBSLs when analyzed for laboratory method 8270.

TIER I ASSESSMENT REPORT OF FINDINGS

I. INTRODUCTION

A. Owner/Operator Information

Facility Name: *Charleston Naval Complex, Former Building 1279*

UST Permit Number: *15368*

Facility Address: *Building 1279 - Hobson Blvd*
Charleston Naval Complex, North Charleston
SC 29904-5001

Facility Phone Number: *(843) 820-7307*

B. Property Owner Information (if different from above)

Property Owner Name: *United States Navy*

Property Owner Address*: 2155 Eagle Drive*
P.O. Box 190010
North Charleston SC 29419

Property Owner Phone Number: *(843)820-7307*

C. Contractor Information

Name: *ADVENT Environmental Inc.*

SCDHEC Certification Number: *#149*

Address: *498 Wando Park Blvd., Suite 500 Mount Pleasant, SC 29464*

Phone Number: *(843) 388-1851*

D. Facility Information

Address: *Same as Section I-A. Above.*

Description of Adjacent Land Use: *U.S. Government property. Property to be turned over for private/ industrial use.*
Predicted Future Land Use: *Area has been restricted as Industrial only.*

E. Facility History

Date Release Reported to SCDHEC: *No actual recorded date known.*

Estimated Quantity of Product Released: *Unknown amount*

Cause of Release: *Although there are no documented spills and/or leaks, It is suspected that the cause of the releases were leaks in the nearby tanks.*

UST #	Product	Date installed	Currently in use (yes or no)	If not in use,date removed
Tank previously removed	*n/a**		no	unknown
2				
3				

II. SITE CHARACTERISTICS

A. Site Geology:

Describe the topography of the site and surrounding area (slope, vegetation, bodies of water, major land features, etc.):

The topography of the region is flat within 5-10 miles of the coast, and gently rolling hills inland up to the area of the Fall Line (in the vicinity of Orangeburg, along the I-95 corridor). These hills are the result of paleo-shorelines created during the regression of the Atlantic Ocean starting at the end of the last glacial maximum (~ 10,000 years ago).

The Charleston Peninsula has very low relief, with maximum elevations below 20 ft above sea level, and minimum elevations at sea level. Gradient is less than 1%. The immediate area is paved with concrete and asphalt for navy use. No vegetation such as trees or brush in the immediate area.

Mean Elevation of Site: *5 feet above sea level*

B. Exposure Analysis:

Describe all potential receptors and preferential pathways within a 1000-foot radius of the site.

Descrition of receptor	**Distance/direction from site**
No known receptors within 1000 feet	
Utilities are onsite (see Section C below)	

Provide any additional comments necessary to complete the exposure analysis: *None*

C. Utilities Survey:

List the utilities on site, and adjacent to the site within a 250-foot radius, that could serve as exposure points or as preferential pathways:**Utility**	**On site or distance/ direction from site**	**Depth to utility**
Sewage line	*On site-in middle of site*	*2-4 feet below land surface (bls)*
Electrical line	*west (~ 50 feet) from site*	*2-4 ft bls*

Additional Comments: *All utilities were marked by the base utility locators. No other utilities were marked.*

D. Site Geology

Provide a brief description of the regional geology and hydrogeology: and specific geology and stratigraphy:

The Charleston Naval Complex (CNC) is located within the Coastal Plain of South Carolina. This area is characterized by coastal sediments that overlie basement rock, thickening from just a few feet near the Fall Line to about 3,800 feet at the southernmost corner of the state.

The strata of this region consist of unconsolidated to semi-consolidated sediments. At the surface are Quaternary Alluvial Sediments overlying an unconformity of nearly 24 million years. Below the unconformity are the Edisto Formation, the Chandler Bridge Formation and the Cooper Group (Ashley Formation, Parkers Ferry Formation, and the Harleyville Formation). These formations are made up predominantly of unconsolidated sands, gravels, semi consolidated sands and limestone marls. Sediments at and immediately below the surface are well sorted fluvial silts and sands.

These sediments form the aquifers that hold the majority of the states' ground-water. The aquifers are made up of extensive beds of sand or permeable limestone generally bounded above and below by impermeable clay or rock. The hydrology of the region is characterized by a shallow surface aquifer (unconfined) which overlies a series of confined aquifers. The most prominent confined aquifer in the CNC area is the Upper Floridian Aquifer which extends from this area, through Georgia, and to the southern tip of Florida.

Provide a brief description of the specific geology and stratigraphy:

Structurally, the site is contained within the Ridgeland Basin. It is bounded to the north by the Garner-Edisto Normal Fault (physically located on the hanging wall/down-thrown side), and bounded to the south by the Yamacraw Ridge. Stratigraphically, the site is predominantly Eocene-Oligocene marine sediments that overlay basement rock (~3500ft below surface). The sequence starting at basement rock is: Fishburne Formation – unconformity – Congaree Formation – SanteeLimestone – unconformity – Cross Formation – Cooper Group – Chandler Bridge Formation – unconformity – Quaternary Alluvial/Fluvial Sediments (interbedded layers of sand, silty-sand, and clay). The unconformities represent periods of regression.

E. Soil Boring Data

Drilling Dates: *11-2-04 for soil borings SB01 thru SB09.*
Provide a brief justification for the location of the soil borings

Soil Borings SB001, SB008 and SB002 were located around the previous pumping station. Soil Borings SB003, SB004, SB005, SB006, and SB007 were installed around the previous Underground Storage Tanks.

Standard operating procedure for field screening:

A soil sample was collected from the surface at five foot intervals down to ground-water for each soil boring. Soils from each five foot interval were put into zip lock bags and screened for volatiles using the Organic Vapor Analyzer (OVA). The soil sample from the interval with the highest OVA reading from each soil boring was collected and sent to a certified laboratory to be analyzed for the targeted parameters.

Complete the table below for each soil boring.

Soil Boring	Split Spoon Interval (ft)	Field screening results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist etc. Petroleum odor)
SB01	0-5	54.6	Sandy-silt, dark brown/black, small grains	Dry- no odor

Soil Boring	Split Spoon Interval (ft)	Field screening results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist etc. Petroleum odor)
SB02	0-5	47.9	Sandy-silt, dark brown/black, small grains	Dry- no odor

Soil Boring	Split Spoon Interval (ft)	Field screening results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist etc. Petroleum odor)
SB03	0-5	75.9	Sandy-silt, red soil small grains	Dry- no odor

Soil Boring	Split Spoon Interval (ft)	Field screening results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist etc. Petroleum odor)
SB04	0-5	57.1	Sandy-siltred-clay, small grains. Some Staining	Dry- no odor

Soil Boring	Split Spoon Interval (ft)	Field screening results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist etc. Petroleum odor)
SB05	0-5	47.9	Sandy-silt, dark brown/red, small grains	Dry- no odor

Soil Boring	Split Spoon Interval (ft)	Field screening results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist etc. Petroleum odor)
SB06	0-5	47.4	Sandy-silt, reddish brown, small grains	Dry- no odor

Soil Boring	Split Spoon Interval (ft)	Field screening results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist etc. Petroleum odor)
SB07	0-5	113.6	Sandy-silt, dark brown, small grains	Dry- Strong odor

Soil Boring	Split Spoon Interval (ft)	Field screening results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist etc. Petroleum odor)
SB08	0-5	60.8	Sandy-silt, dark brown, small grains	Dry- no odor

Enter the soil analytical data for each soil boring for all COC in the Table below. Enter the appropriate RBSL for the soil type from Tables 4 through 8 in SCDHEC Risk-Based Corrective Action (RBCA) for Petroleum Releases Guidance Document:

See Table 1.1

Discuss the horizontal and vertical extent of CoC in the soil:
Contaminates of Concern are above the RBSLs in samples SB002 thru SB007. In all of these soil samples the soils just above the ground-water table were sampled.

Additional Comments: *none*

F. Chemicals of Concern – Ground-water

Provide well installation information in the table below:

MW #	Installation date	Development date	Sampling date
1279GW001	*11-3-04*	*11-5-04*	*11-11-04*
1279GW002	*11-3-04*	*11-5-04*	*11-11-04*
1279GW003	*11-3-04*	*11-5-04*	*11-11-04*

Enter the soil analytical data for each monitoring well for all CoC in the table below:

COC	GW002	GW007	GW009
Depth of Sample	0-5 feet below land surface	0-5 feet below land surface	0-5 feet below land surface
Benzene	ND	ND	ND
Toluene	ND	ND	ND
Ethyl Benzene	ND	5600 ug/kg	8.7 ug/kg
Xylenes	ND	ND	ND
Total BTEX	ND	5600 ug/kg	ND
Naphthalene	ND	11000.0 ug/kg	44.0 ug/kg
Benzo(a)anthracene	83.0 ug/kg	630.0 ug/kg	ND
Benzo(b)flouranthene	90.0 ug/kg	440.0 ug/kg	ND
Benzo(k)flouranthene	ND	160.0 ug/kg	ND
Chrysene	75.0 ug/kg	640.0 ug/kg	ND
Dibenz(a,h)anthracene	ND	ND	ND

III. n/s= Not Sampled. Well is used for background well.
IV. N/D= Not Detected, below the RBSLs for clay soil.
V. All results in ug/kg.

Summarize the monitoring well and ground-water data in the table below:

MW #	TOC elevation (ft)	Screened interval	Depth to water from TOC
GW002	12.45	5'-15'	3.25 feet
GW007	12.76	5'-15'	4.25 feet
GW009	19.44	5'-15'	3.6 feet

Enter field data measurements (temperature, pH, conductivity) taken during well purging on the form provided (see appendix H). Complete for each well.

Enter dissolved oxygen measurements for each well in the table below.

MW #	GW002	GW007	GW009
Dissolved Oxygen (mg/l)	7.16 mg/L	6.54 mg/L	6.81 mg/L

Enter the ground-water analytical data for each monitoring well for all CoC in the table below. If free product is present, indicate the measured thickness to the nearest 0.01 feet.

COC	***RBSL (UG/L)***	**GW002 (UG/L)**	**GW007 (UG/L)**	**GW009 (UG/L)**
Free Product Thickness		none	none	none
Benzene	*5*	ND	ND	**10**
Toluene	*1,000*	ND	ND	ND
Ethyl Benzene	*700*	ND	76	16
Xylenes	*10,000*	ND	ND	ND
Total BTEX	*n/a*	ND	76	16
Naphthalene	*25*	ND	**57**	22
Benzo(a)anthracene	*10*	ND	ND	ND
Benzo(b)flouranthene	*10*	ND	ND	ND
Benzo(k)flouranthene	*10*	ND	ND	ND
Chrysene	*10*	ND	ND	ND
Dibenz(a,h)anthracene	*10*	ND	ND	ND
Ferrous Iron	*n/a*	NS	NS	NS
Lead	*Site specific*	0.029	0.03	0.023
Nitrates	*n/a*	.48	.65	.26
Sulfates	*n/a*	8.0	10	10
MTBE	*40*	ND	ND	ND

N/A = not applicable
ND = Not detected (below RBSL)
ug/L= micrograms per liter
RBSL= Risked Based Screening Level

Additional Comments:

G. Aquifer Characteristics:

A slug test was conducted in well 1279GW008. Data and calculations of aquifer characteristics are provided in Appendix D. The results are summarized below.

Hydraulic Conductivity: *274.32 feet/day (ft/d)*

Hydraulic Gradient: *-0.02 Liter/Liter (L/L)*

Porosity: *0.27 L/L*

Estimated Seepage Velocity: *20.35 ft/d*

Complete the slug test form and include in Appendix D of the report. Include all data, graphs, and equations used to derive the aquifer characteristics and hydrologic parameters (hydraulic conductivity, seepage velocity, hydraulic gradient, etc.) in Appendix D.

III. TIER I EVALUATION

A. Current Land Use

Identify any potential receptors or human exposure pathways (e.g. basements, contaminated soils from UST closures, etc.) within a 1000-foot radius for current land use. Complete the table below.

Media (for exposure)	Exposure route	Pathway selected for evaluation? yes or no	Exposure point or reason for non-selection	Data requirements (if pathway selected)
Air	Ingestion	No		
	Explosion Hazard	No		
Ground-water	Ingestion	No		
	Dermal Contact	No		
	Inhalation	No		
Surface Water	Ingestion	No		
	Dermal Contact	No		
	Inhalation	No		
Surficial Soil	Ingestion	No		
	Dermal Contact	No		
	Inhalation	No		
	Leaching to Ground-water	No		
Subsurface Soil	Ingestion	No		
	Dermal Contact	No		
	Volatile Inhalation	No		
	Leaching to Ground-water	No		

B. Future Land Use

Identify any potential receptors or human exposure pathways (e.g. basements, contaminated soils from UST closures ect) within a 1000 foot radius for projected future land use. Complete the table below.

Media (for exposure)	Exposure route	Pathway selected for evaluation? yes or no	Exposure point or reason for non-selection	Data requirements (if pathway selected)
Air	Ingestion	No		
	Explosion Hazard	No		
Ground-water	Ingestion	No		
	Dermal Contact	No		
	Inhalation	No		
Surface Water	Ingestion	No		
	Dermal Contact	No		
	Inhalation	No		
Surficial Soil	Ingestion	No		
	Dermal Contact	No		
	Inhalation	No		
	Leaching to Ground-water	No		
Subsurface Soil	Ingestion	No		
	Dermal Contact	No		
	Volatile Inhalation	No		
	Leaching to Ground-water	No		

TABLE 1.1
Soil Analytical Data

Table 1: Summary of Ground-water Analytical Data
Charleston Naval Complex Building 1279

Ground-Water Results

Constituents	1279GW002 11/4/2004 Result	*RBSL Ground-water*	1279GW007 11/4/2004 Result	*RBSL Ground-water*	1279GW009 11/4/2004 Result	*RBSL Ground-water*
Volatile Organic Compounds Method 8260	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*
Benzene	1.0 u	*5*	3.5	*5*	**10**	*5*
Toluene	1.0 u	*1,000*	1.0 u	*1,000*	1 u	*1,000*
Ethylbenzene	1.0 u	*700*	76	*700*	16	*700*
Xylenes	3.0 u	*10000*	3.0 u	*10000*	3.0 u	*10000*
Naphthalene	2.0 u	*25*	**57**	*25*	22	*25*
MtBE	1.0 u	*40*	1 u	*40*	1.0	*40*
Semi-Volatile Organic Compounds Method 8270	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*
Benzo(a)anthracene	.10 u	*10*	.10 u	*10*	.10 u	*10*
Benzo(b)fluoranthene	.10 u	*10*	.10 u	*10*	.10 u	*10*
Benzo(k)fluoranthene	.10 u	*10*	.10 u	*10*	.10 u	*10*
Chrysene	.10 u	*10*	.10 u	*10*	.10 u	*10*
Dibenz(a,h)anthracene	.10 u	*10*	.10 u	*10*	.10 u	*10*
Total PAHs	.10 u	*25*	.10 u	*25*	.10 u	*25*
Metals	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*	*(ug/L)*
Arsenic	NS	*15*	NS	*15*	NS	*15*
Barium	NS	*50*	NS	*50*	NS	*50*
Cadmium	NS	*2000*	NS	*2000*	NS	*2000*
Chromium	NS	*5*	NS	*5*	NS	*5*
Lead	0.029	*100*	0.03	*100*	0.023	*100*

Table 1-1: Summary of Soil Analytical Data
Charleston Naval Complex Building 1279 Tier I

Soil Results

Constituents	*RBSL Clay Rich Soils*	SB001 11/4/2004 Result	SB002 11/4/2004 Result	SB003 11/4/2004 Result	SB004 11/4/2004 Result	SB005 11/4/2004 Result	SB006 11/4/2004 Result	SB007 11/4/2004 Result	SB008 11/4/2004 Result
Volatile Organic Compounds									
Method 8260	*(ug/kg)*	*(ug/kg)*	*(ug/kg)*	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Benzene	*3*	ND	ND	ND	**22.0**	ND	2.0	ND	ND
Toluene	*627*	ND	0.8	ND	**2.0**	ND	ND	ND	ND
Ethylbenzene	*1551*	ND	ND	4.0	**32.0**	16.0	50	**5600**	8.7
Xylenes	*13010*	ND	ND	ND	**3.8**	ND	ND	ND	ND
Naphthalene	*47*	2.5	ND	17.0	**1.4**	2.8	2.0	**11000**	4.0
Semi-Volatile Organic Compounds									
Method 8270	*(ug/kg)*	(ug/kg)	*(ug/kg)*	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Naphthalene	*47*	ND	ND	**52**	**92.0**	**70**	240.0	10000	44.0
Benzo(a)anthracene	*66*	ND	**83**	ND	ND	**78**	220.0	630	ND
Benzo(b)fluoranthene	*66*	ND	**90**	ND	ND	**110**	290.0	440	ND
Benzo(k)fluoranthene	*66*	ND	ND	ND	ND	ND	100.0	160	ND
Chrysene	*66*	ND	**75**	ND	ND	**130**	330.0	640	ND
Dibenz(a,h)anthracene	*66*	ND	ND	ND	ND	ND	41.0	ND	ND
TPH/ DRC		ND	NS	NS	NS	NS	NS	220 mg/kg	NS
TOC		ND	NS	NS	NS	NS	NS	ND	NS
Metals		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Arsenic		NS	1.5	NS	NS	NS	NS	NS	NS
Barium		NS	34.0	NS	NS	NS	NS	NS	NS
Cadmium		NS	ND	NS	NS	NS	NS	NS	NS
Chromium		NS	5.0	NS	NS	NS	NS	NS	NS
Lead		NS	3.0	NS	NS	NS	NS	NS	NS
Selenium		NS	ND	NS	NS	NS	NS	NS	NS
Silver		NS	ND	NS	NS	NS	NS	NS	NS
Mercury		NS	0.019	NS	NS	NS	NS	NS	NS

ND= Not Detected/ Below the RBSLs

NS= Not Sampled

RBSLs Based on Table B4 of the *South Carolina Risk-Based Corrective Action for Petroleum Releases*

FIGURE 1
Topographic Map

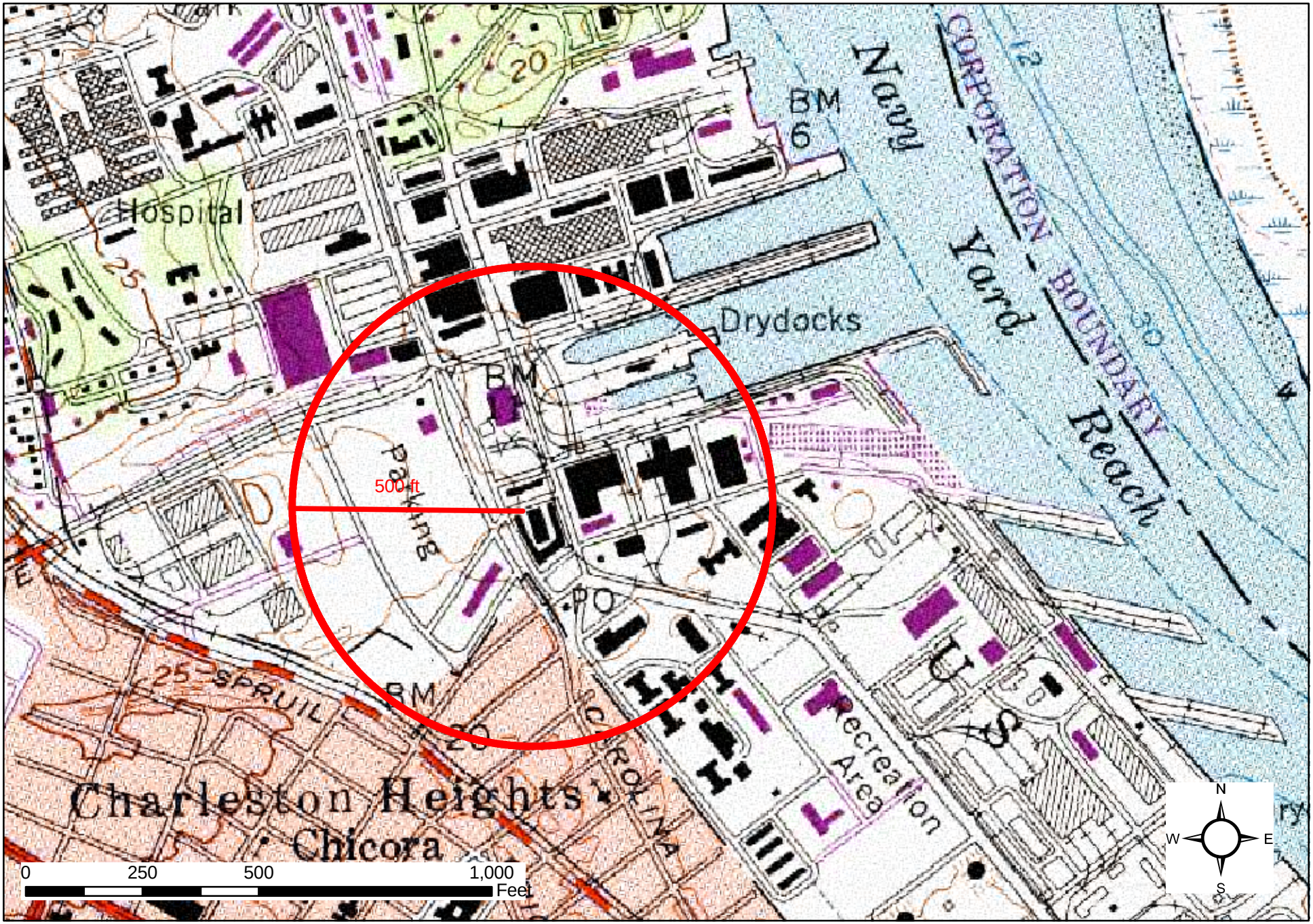


Figure 1: Topographic Map Showing 500ft Radius of Site.	Prepared by: ADVENT Environmental, Inc. Project 04-511 December 17, 2004	Building 1279 Charleston Naval Complex Charleston, SC

FIGURE 2
Scaled Site Location Map

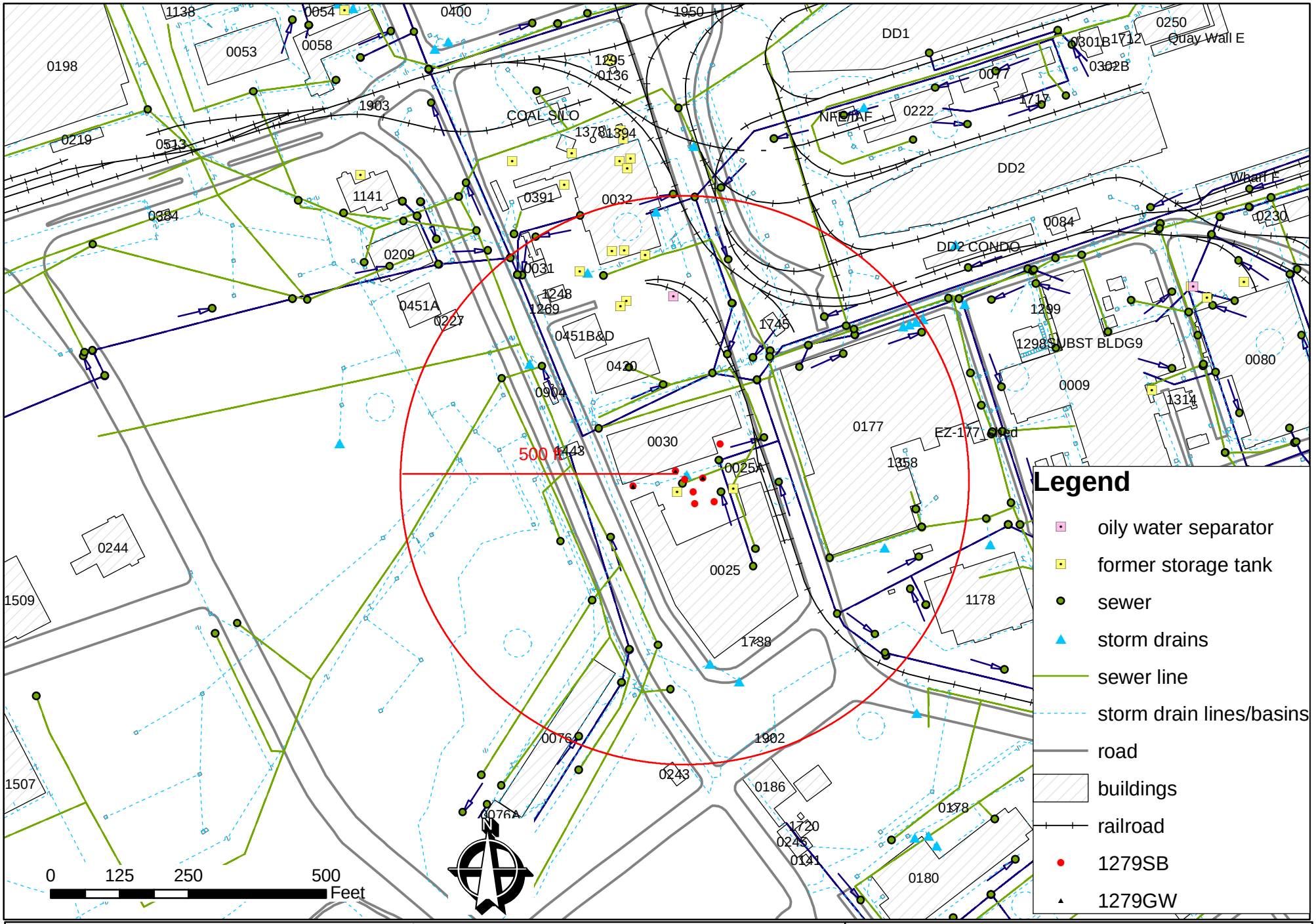


Figure 2: Scaled Site Location Map of Building 1279	Prepared by: ADVENT Environmental, Inc. Project 04-511 December 16, 2004	Building 1279 Charleston Naval Complex Charleston, SC

FIGURE 3
Surveyed Site Map

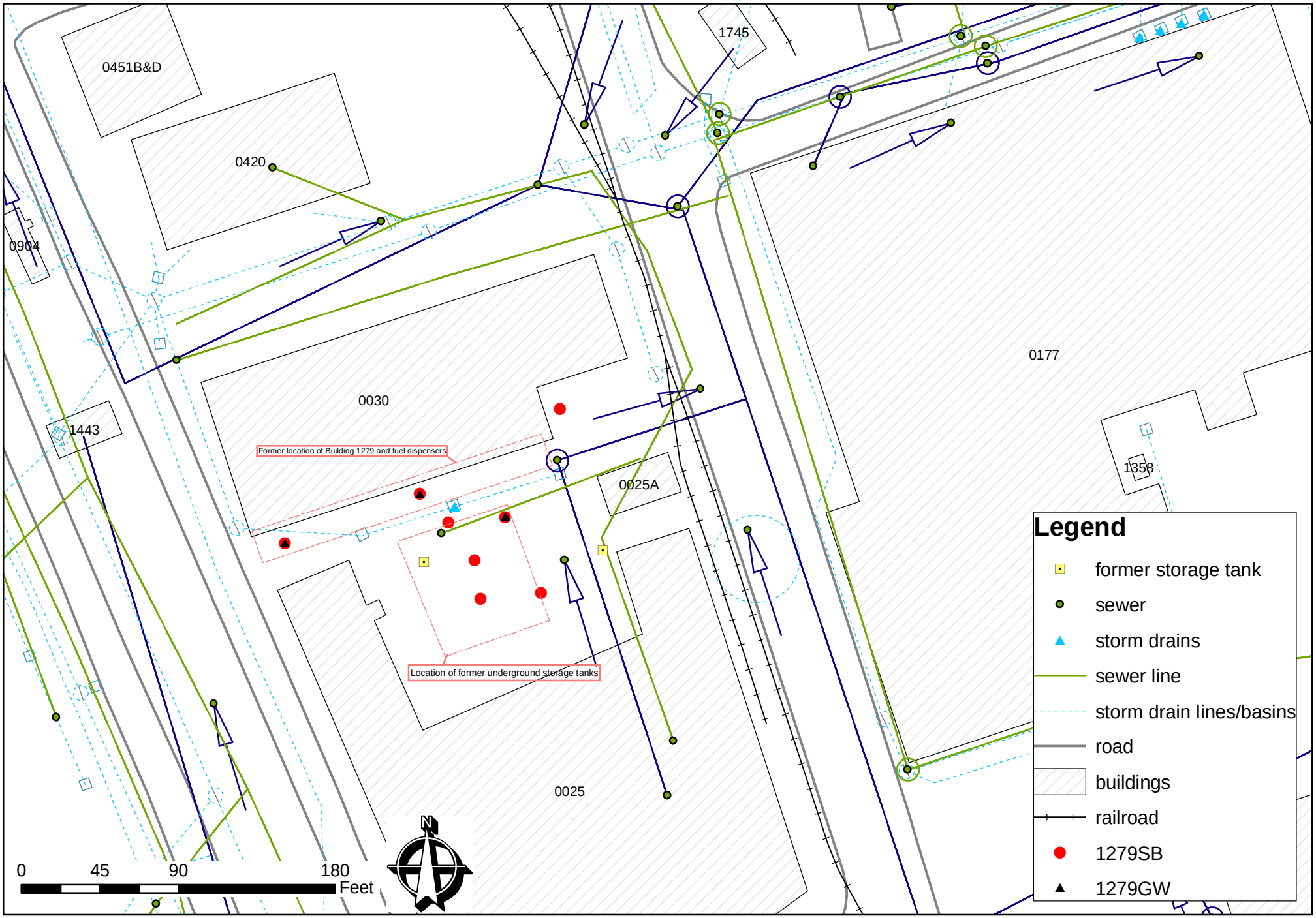


Figure 3: Surveyed Site Map Including Utilities	Prepared by: ADVENT Environmental, Inc. Project 04-511 December 16, 2004	Building 1279 Charleston Naval Complex Charleston, SC

FIGURE 4
Soil Chemicals of Concern Map

Constituents of Concern	*RBSL Clay Rich Soils	SB001 Result (ug/kg)	SB002 Result (ug/kg)	SB003 Result (ug/kg)	SB004 Result (ug/kg)	SB005 Result (ug/kg)	SB006 Result (ug/kg)	SB007 Result (ug/kg)	SB008 Result (ug/kg)
Benzene	*3*	ND	ND	ND	22	ND	2	ND	ND
Toluene	*627*	ND	ND	ND	2	ND	ND	ND	ND
Ethylbenzene	*1551*	ND	ND	4	32	16	50	**5600**	8.7
Xylenes	*13010*	ND	ND	ND	3.8	ND	ND	ND	ND
Naphthalene	*47*	2.5	ND	17.0	1.4	2.8	2.0	**11000.0**	4.0
Naphthalene	*47*	ND	ND	**52**	**92.0**	**70.0**	**240.0**	**10000.0**	44.0
Benzo(a)anthracene	*66*	ND	**83.0**	ND	ND	**78.0**	**220.0**	**630.0**	ND
Benzo(b)fluoranthene	*66*	ND	**90.0**	ND	ND	**110.0**	**290.0**	**440.0**	ND
Benzo(k)fluoranthene	*66*	ND	ND	ND	ND	ND	**100.0**	**160.0**	ND
Chrysene	*66*	ND	**75.0**	ND	ND	**130.0**	**330.0**	**640.0**	ND
Dibenz(a,h)anthracene	*66*	ND	ND	ND	ND	ND	41.0	ND	ND
TPH/ DRC	-	NS	NS	NS	NS	NS	NS	220 mg/kg	NS
TOC	-	NS	NS	NS	NS	NS	NS	ND mg/kg	NS
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Arsenic	-	NS	1.5	NS	NS	NS	NS	NS	NS
Barium	-	NS	**34.0**	NS	NS	NS	NS	NS	NS
Cadmium	-	NS	ND	NS	NS	NS	NS	NS	NS
Chromium	-	NS	**5.0**	NS	NS	NS	NS	NS	NS
Lead	-	NS	3.0	NS	NS	NS	NS	NS	NS
Selenium	-	NS	ND	NS	NS	NS	NS	NS	NS
Silver	-	NS	ND	NS	NS	NS	NS	NS	NS
Mercury	-	NS	0.019	NS	NS	NS	NS	NS	NS

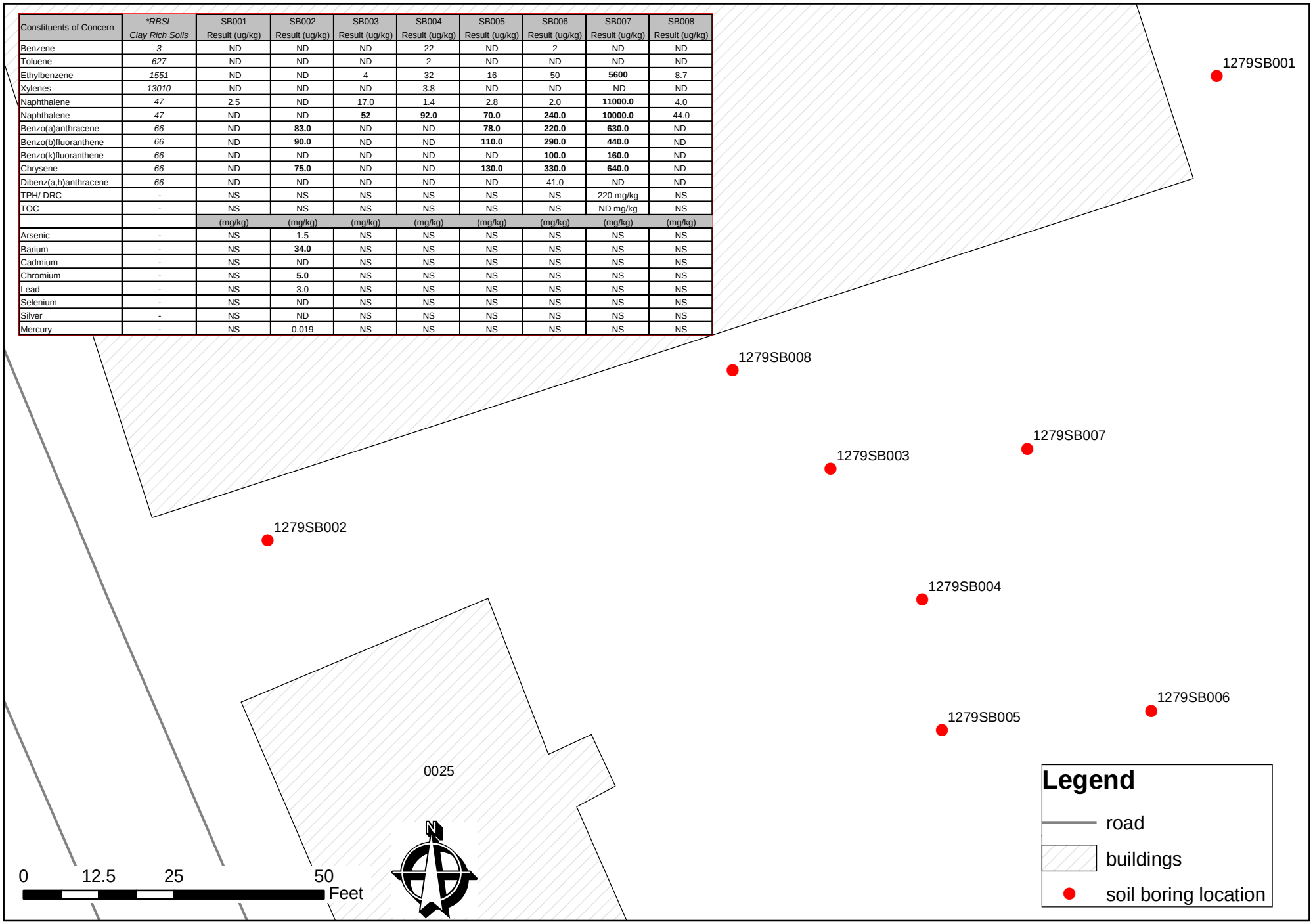
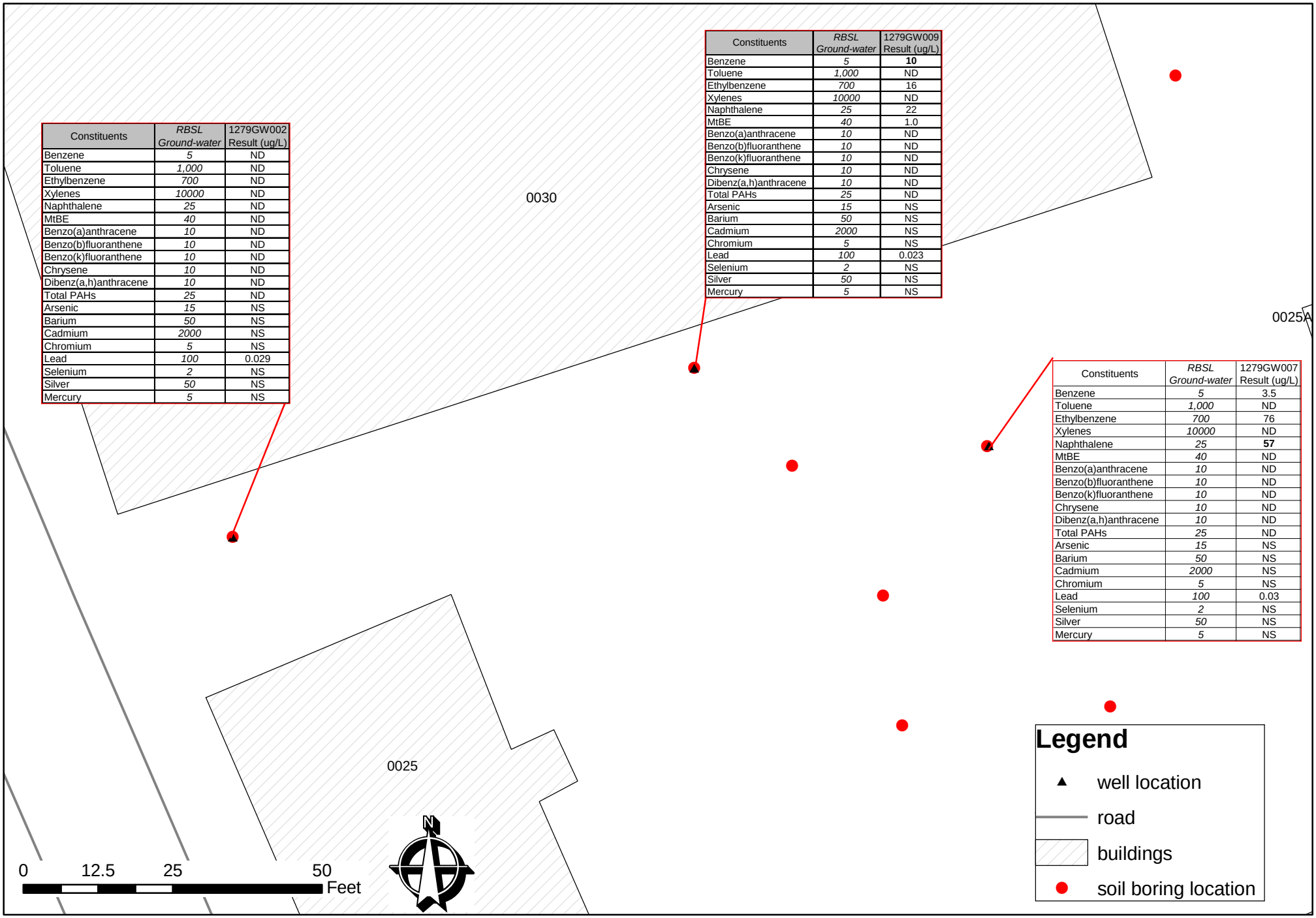


Figure 4: Concentration of Constituents of Concern Detected at Soil Borings

Prepared by:
ADVENT Environmental, Inc.
Project 04-511
December 16, 2004

Building 1279
Charleston Naval Complex
Charleston, SC

FIGURE 5
Ground-Water Chemicals of Concern Map



Constituents	*RBSL Ground-water*	1279GW002 Result (ug/L)
Benzene	*5*	ND
Toluene	*1,000*	ND
Ethylbenzene	*700*	ND
Xylenes	*10000*	ND
Naphthalene	*25*	ND
MtBE	*40*	ND
Benzo(a)anthracene	*10*	ND
Benzo(b)fluoranthene	*10*	ND
Benzo(k)fluoranthene	*10*	ND
Chrysene	*10*	ND
Dibenz(a,h)anthracene	*10*	ND
Total PAHs	*25*	ND
Arsenic	*15*	NS
Barium	*50*	NS
Cadmium	*2000*	NS
Chromium	*5*	NS
Lead	*100*	0.029
Selenium	*2*	NS
Silver	*50*	NS
Mercury	*5*	NS

Constituents	*RBSL Ground-water*	1279GW009 Result (ug/L)
Benzene	*5*	**10**
Toluene	*1,000*	ND
Ethylbenzene	*700*	16
Xylenes	*10000*	ND
Naphthalene	*25*	22
MtBE	*40*	1.0
Benzo(a)anthracene	*10*	ND
Benzo(b)fluoranthene	*10*	ND
Benzo(k)fluoranthene	*10*	ND
Chrysene	*10*	ND
Dibenz(a,h)anthracene	*10*	ND
Total PAHs	*25*	ND
Arsenic	*15*	NS
Barium	*50*	NS
Cadmium	*2000*	NS
Chromium	*5*	NS
Lead	*100*	0.023
Selenium	*2*	NS
Silver	*50*	NS
Mercury	*5*	NS

Constituents	*RBSL Ground-water*	1279GW007 Result (ug/L)
Benzene	*5*	3.5
Toluene	*1,000*	ND
Ethylbenzene	*700*	76
Xylenes	*10000*	ND
Naphthalene	*25*	**57**
MtBE	*40*	ND
Benzo(a)anthracene	*10*	ND
Benzo(b)fluoranthene	*10*	ND
Benzo(k)fluoranthene	*10*	ND
Chrysene	*10*	ND
Dibenz(a,h)anthracene	*10*	ND
Total PAHs	*25*	ND
Arsenic	*15*	NS
Barium	*50*	NS
Cadmium	*2000*	NS
Chromium	*5*	NS
Lead	*100*	0.03
Selenium	*2*	NS
Silver	*50*	NS
Mercury	*5*	NS

Figure 5: Concentrations of Constituents of Concern in Ground-Water

Prepared by:
ADVENT Environmental, Inc.
Project 04-511
December 16, 2004

Building 1279
Charleston Naval Complex
Charleston, SC

APPENDIX A
Soil Boring Logs

ADVENT

SOIL TEST BORING FIELD REPORT

BORING NO. SB01 thru SB8

JOB NO. 04-511 | DRILLING CONTRACTOR Diversified Drilling | PAGE 1 OF 1

JOB NAME CNC BLDG 1279 | INSPECTOR JW | GROUND SURFACE ELEV.

DATE 11/11/04 TIER I | TIME - RATE (CLEANING, ETC.) HRS. | WELL CASING ELEV.

SAMPLING NO.	DEPTH	"N" 1ST 6"	2ND 6"	3RD 6"	SCALE	LABORATORY SAMPLE	OVA/HNU READINGS	SOIL CLASSIFICATION
	SB01				0			
1	0-5					X	54.6 ppm	clay, SAND / NO ODOR - Brown
								Sample collected @ 5' bls
	SB02				5			
2	0-5					X	54.8 ppm	Clay SAND / NO ODOR - Dark Brown
								Sample collected at 5' bls
	SB03							
3	0-5				0	X	47.2 ppm	Clay - SAND - NO ODER - Red
								Sample collected at 5' bls
	SB04					X	75.9 ppm	SAND - Red - NO ODOR
4	0-5							
					5			
5	SB05					X	57.1 PPM	SAND-Clay Reddish brown - NO ODOR
	0-5							Sample collected @ 5' bls
6	SB06				0	X	47.4 PPM	Reddish - brown SAND NO ODOR.
	0-5							
7	SB07							
	0-5				5	X	113.6 PPM	GRAY - brown & STRONG ODOR &
								Sample collected @ 5' bls
8	SB08							
	0-5					X	60.8 ppm	Reddish Clay SAND NO ODOR
					0			
					5			
					0			

DISPOSITION OF CUTTINGS

BORING TERMINATED: Boorings #7 and # 8 became

~~BORING REMOVAL:~~ MWS.

WATER TOB DEPTH: Approximately 5' bls - 5 1/2' bls

WATER 24 HR. DEPTH:

WATER LOSSES:

DISPOSITION OF FLUIDS

METHOD OF ADVANCING BORING	DEPTH
HOLLOW STEM AUGER	TO
ROTARY DRILL: W/MUD: W/WATER: W/AIR:	TO
DIAMOND CORE (SIZE)	TO
HAND AUGER	TO

COMPLETION: GROUT BACKFILL SOIL BACKFILL WELL

APPENDIX B
Monitoring Well Construction Logs

MONITORING WELL INSTALLATION DIAGRAM – MANHOLE/STICK-UP TYPE

THE ADVENT GROUP, INC.

WELL NUMBER: Ø279 GW007
PROJECT NUMBER: 04-511
DATE INSTALLED: 11/4/04
CITY, STATE: Charleston SC

LOCATION OF WELL (ON-SITE DESCRIPTION):
In Front of Former Bldg 1279
Used as up-Gradient Well

DRILLING CONTRACTOR: Static Diversified

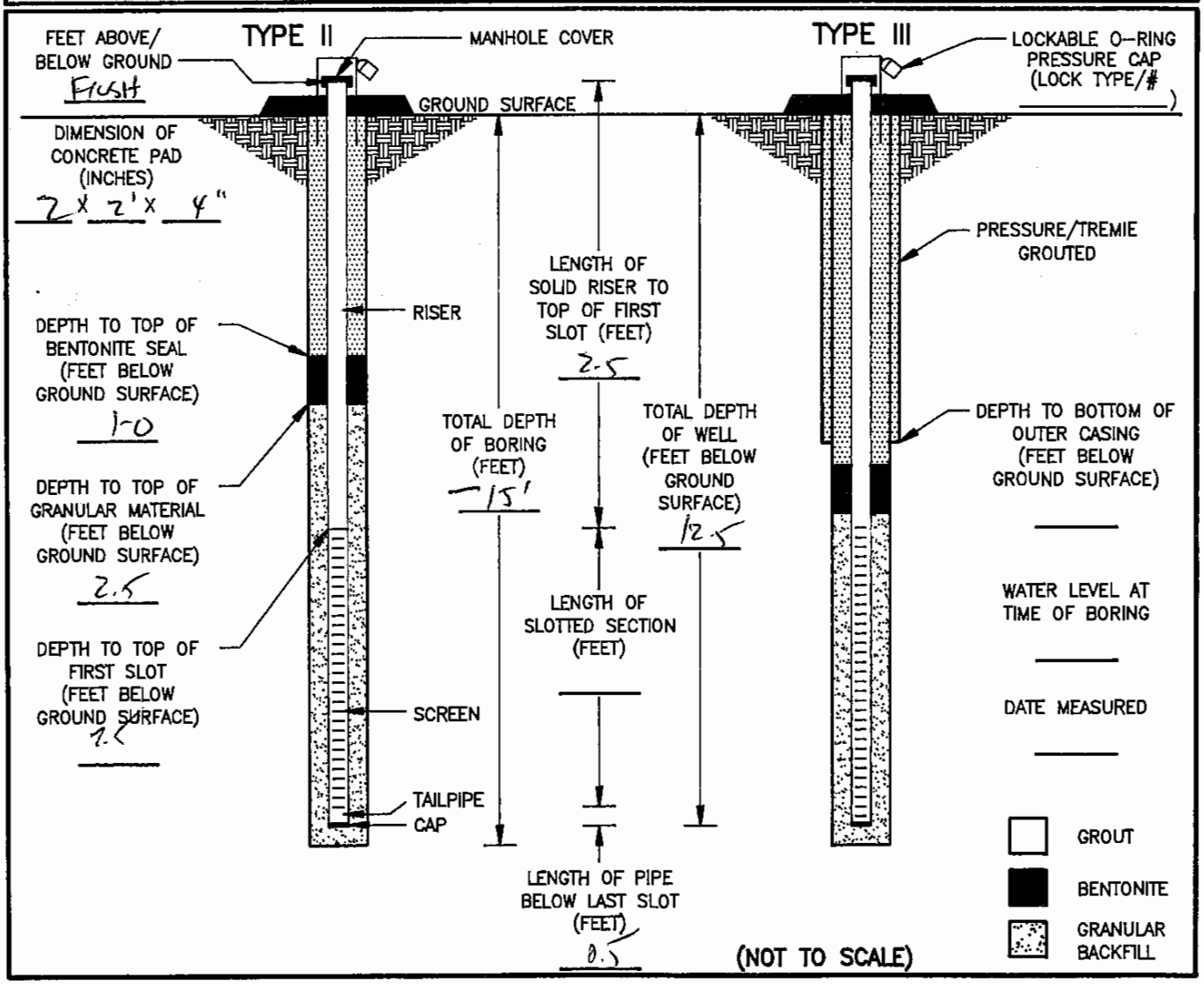
DRILLING METHODS (Size and Type)
0 to ____ Ft. 1 DIA. 4 In.
____ to ____ Ft. ____ DIA. ____ In.
____ to ____ Ft. ____ DIA. ____ In.

DRILLER'S NAME: Static

REMARKS:

LOGGED BY: DW

WELL MATERIALS (size or amount, type, manufacturer):
Riser(s): ____ DIA. 2 In.
Screen: ____ DIA. 2 In.
Cement: Portland
Sand: 3/8"
Bentonite: 20/30 Sieve Size Silica
SCREEN SLOT SIZE (In.): 0.010"
COVER:
CHECKED BY: RE



NOTE: See back page for additional information and conversion units.

MONITORING WELL INSTALLATION DIAGRAM – MANHOLE/STICK-UP TYPE

THE ADVENT GROUP, INC.

WELL NUMBER: 1279GW017
PROJECT NUMBER: 04-511
DATE INSTALLED: 11/4/04
CITY, STATE: Charleston SC

LOCATION OF WELL (ON-SITE DESCRIPTION):
In Front of Former Bldg 1279
Used as Source well

DRILLING CONTRACTOR:

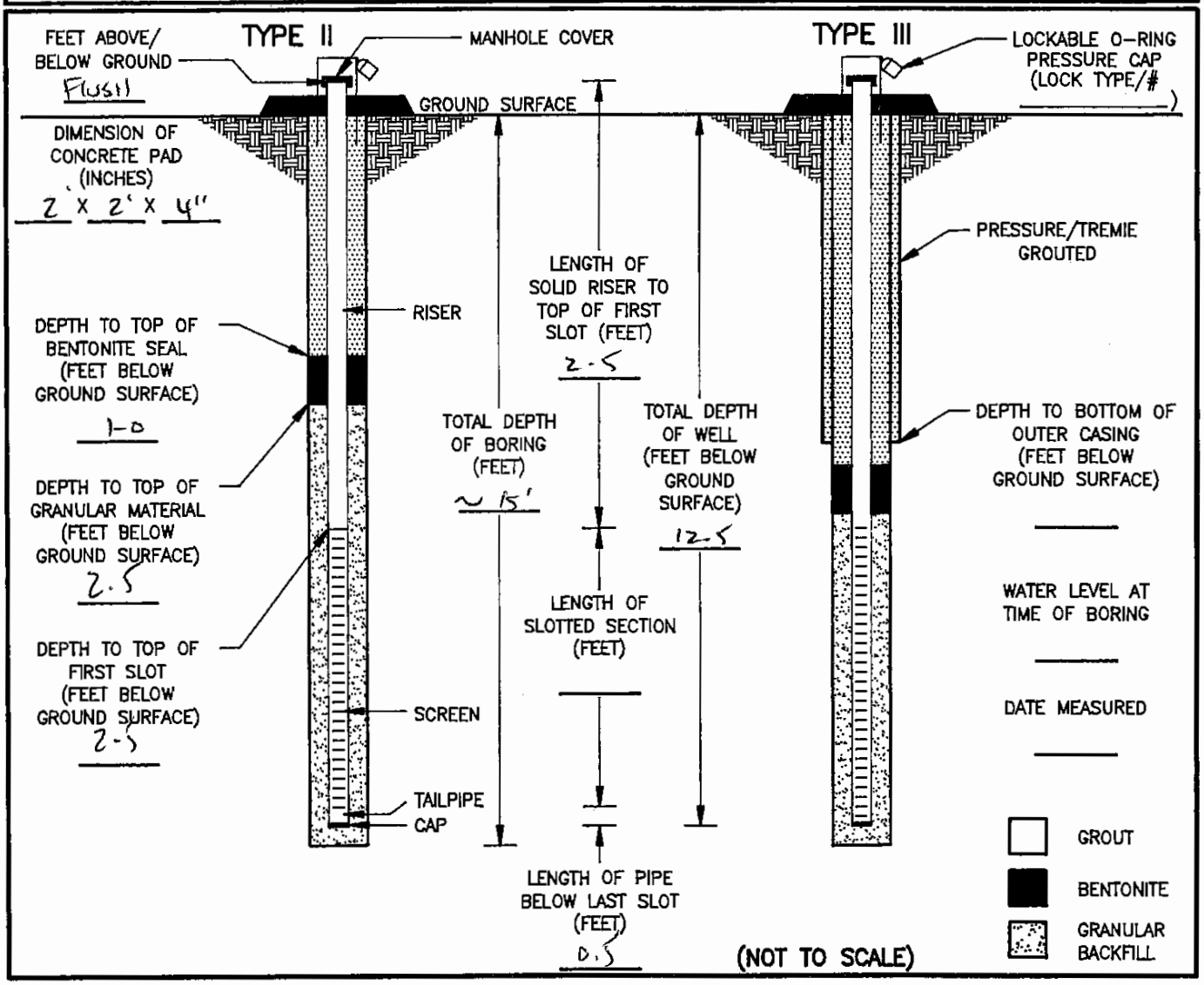
DRILLING METHODS (Size and Type)
0 to ____ Ft. 1 DIA. 6 In.
____ to ____ Ft. ____ DIA. ____ In.
____ to ____ Ft. ____ DIA. ____ In.

DRILLER'S NAME: Stable

REMARKS: 2" well

LOGGED BY: DW

WELL MATERIALS (size or amount, type, manufacturer):
Riser(s): ____ DIA. 2 In.
Screen: ____ DIA. 2 In.
Cement: Portland
Sand: Sieve size (20/30) Silica
Bentonite: 3/8"
SCREEN SLOT SIZE (In.): 0.010"
COVER:
CHECKED BY: DC



NOTE: See back page for additional information and conversion units.

MONITORING WELL INSTALLATION DIAGRAM – MANHOLE/STICK-UP TYPE

THE ADVENT GROUP, INC.

WELL NUMBER: 1279GU009
PROJECT NUMBER: 04-511
DATE INSTALLED: 11-4-04
CITY, STATE: CHARLESTON SC

LOCATION OF WELL (ON-SITE DESCRIPTION):
IN FRONT of FORMER BLDG 1279
USED AS DOWN GRADIENT WELL

DRILLING CONTRACTOR: Diversified

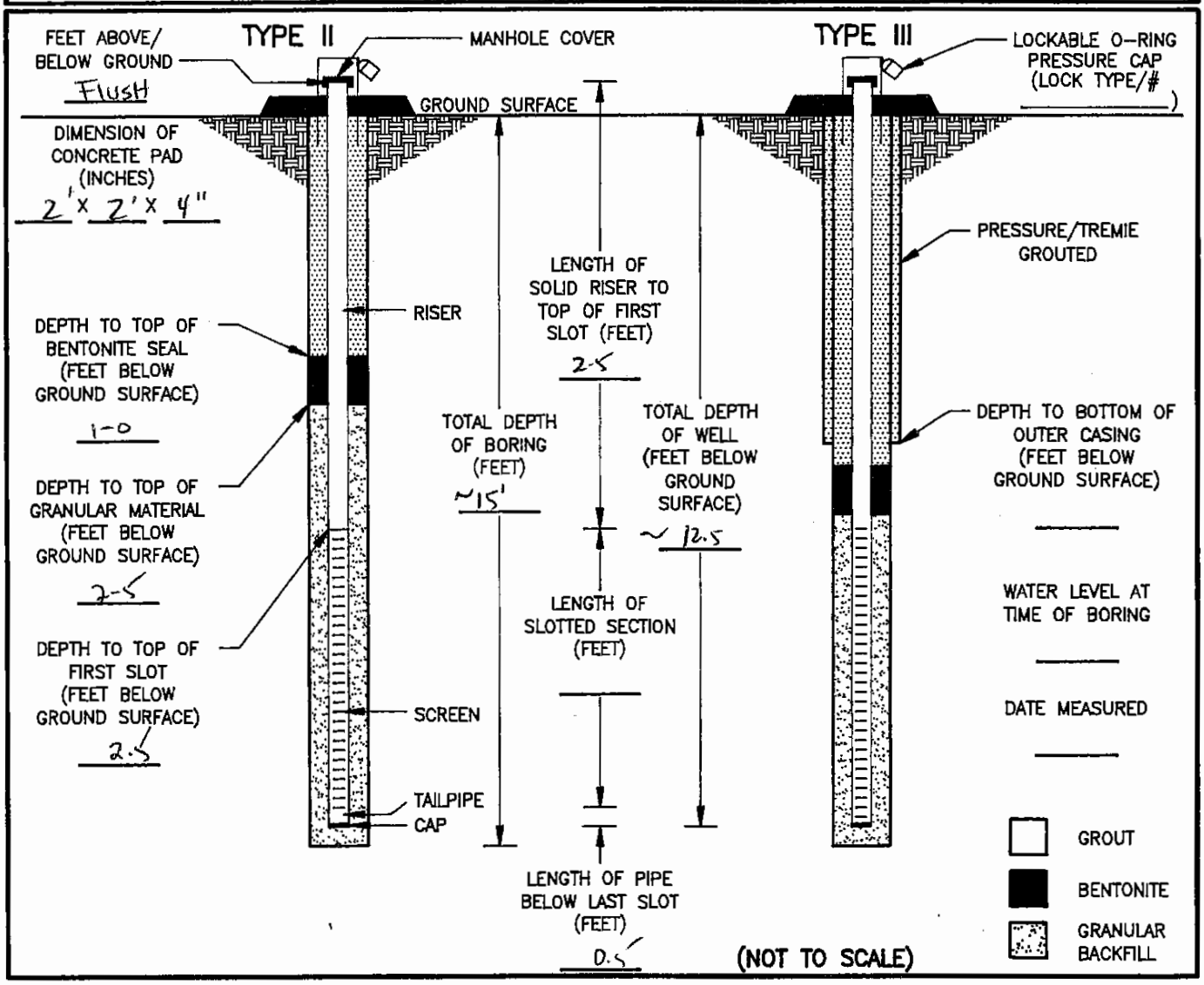
DRILLING METHODS (Size and Type)
0 to ____ Ft. 1 DIA. 6 In.
____ to ____ Ft. ____ DIA. ____ In.
____ to ____ Ft. ____ DIA. ____ In.

DRILLER'S NAME: STACK

REMARKS: 2" well

LOGGED BY: [illegible]

WELL MATERIALS (size or amount, type, manufacturer):
Riser(s): ____ DIA. 2 In.
Screen: 1/10" DIA. 2 In.
Cement: Portland
Sand: 20/30 Sieve, Size, Silica
Bentonite: 3/8" Bentonite
SCREEN SLOT SIZE (In.): 0.010
COVER: 3/8 Bentonite Seal
CHECKED BY: [illegible]



NOTE: See back page for additional information and conversion units.

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: N.A.V.F.A.C. southern div. (last) (first)
Address: 2155 Eagle dr.
City: North Charleston State: S.C. Zip: 29419-9010
Telephone: Work: (843) 820-7307 Home:

2. LOCATION OF WELL: COUNTY: Chas.
Name: Charleston Navel Complex Bldg.1279
Street Address:
City: North Charleston Zip: 29419-9010
Latitude: 32 51 658" Longitude: 79 58 128"

3. PUBLIC SYSTEM NAME: bldg 1279 **PUBLIC SYSTEM NUMBER:** SB002

4. ABANDONMENT: ☐ Yes ☑ No
Grouted Depth: from _____ ft. to _____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
see attached		
*Indicate Water Bearing Zones (Use a 2nd sheet if needed)		

5. REMARKS:
SB002

6. TYPE: ☐ Mud Rotary ☐ Jetted ☑ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☐ Other

7. PERMIT NUMBER:

8. USE: ☐ Residential ☐ Public Supply ☐ Process ☐ Irrigation ☐ Air Conditioning ☐ Emergency ☐ Test Well ☑ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 11/01/04
15.0 ft. Date Completed: 11/01/04

10. CASING: ☑ Threaded ☐ Welded
Diam.: 2"
Type: ☑ PVC ☐ Galvanized ☐ Steel ☐ Other
0.00 in. to 5.0 ft. depth
_____ in. to _____ ft. depth
Height: Above ☐ Below ☐
Surface N/A ft.
Weight N/A lb./ft.
Drive Shoe? ☐ Yes ☑ No

11. SCREEN:
Type: PVC Diam.: 2"
Slot/Gauge: 010 Length: 10.0
Set Between: 5.0 ft. and 15.0 ft.
_____ ft. and _____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☑ No

12. STATIC WATER LEVEL n/a ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
n/a ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☐ No
Yield: _____

14. WATER QUALITY
Chemical Analysis ☑ Yes ☐ No Bacterial Analysis ☐ Yes ☑ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☑ Yes ☐ No
Installed from 15.0 ft. to 2.0 ft.
Effective size med. Uniformity Coefficient n/a

16. WELL GROUTED? ☑ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☑ Bentonite/Cement ☐ Other _____
Depth: From 2.0 ft. to 0.00 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type n/a
Well Disinfected ☐ Yes ☑ No Type: _____ Amount: _____

18. PUMP: Date installed: _____ Not installed ☑
Mfr. Name: _____ Model No.: _____
H.P. _____ Volts _____ Length of drop pipe ___ ft. Capacity ___ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: Diversified Drilling Service **CERT. NO.:** 1142
Address: (Print) Level: A B C D (circle one) ☑ ☐ ☐ ☐
620 Palmetto st. MT.Pleasant S.C. 29464
Telephone No.: 843-607-2017 Fax No.: 843-884-4604

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: _____ Date: 11/20/04
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (07/2003) **COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)**

D H E C
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: N.A.V.F.A.C. southern div. (last) (first)
Address: 2155 Eagle dr.
City: North Charleston State: S.C. Zip: 29419-9010
Telephone: Work: (843) 820-7307 Home:

2. LOCATION OF WELL: COUNTY: Chas.
Name: Charleston Navel Complex Bldg.1279
Street Address:
City: North Charleston Zip: 29419-9010
Latitude: 32 51 662" Longitude: 79 58 114"

3. PUBLIC SYSTEM NAME: bldg 1279 **PUBLIC SYSTEM NUMBER:** SB007

4. ABANDONMENT: ☐ Yes ☑ No
Grouted Depth: from _____ ft. to _____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
see attached		
*Indicate Water Bearing Zones (Use a 2nd sheet if needed)		

5. REMARKS:
SB007

6. TYPE: ☐ Mud Rotery ☐ Jetted ☑ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☐ Other

7. PERMIT NUMBER:

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☐ Test Well ☑ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 11/01/04
12.5 ft. Date Completed: 11/01/04

10. CASING: ☑ Threaded ☐ Welded
Diam.: 2"
Type: ☑ PVC ☐ Galvanized ☐ Steel ☐ Other
0.00 in. to 2.5 ft. depth
_____ in. to _____ ft. depth
Height: Above ☐ Below ☐
Surface N/A ft.
Weight N/A lb./ft.
Drive Shoe? ☐ Yes ☑ No

11. SCREEN:
Type: PVC Diam.: 2"
Slot/Gauge: 010 Length: 10.0
Set Between: 2.5 ft. and 12.5 ft.
_____ ft. and _____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☑ No

12. STATIC WATER LEVEL n/a ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
n/a ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☐ No
Yield: _____

14. WATER QUALITY
Chemical Analysis ☑ Yes ☐ No Bacterial Analysis ☐ Yes ☑ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☑ Yes ☐ No
Installed from 12.5 ft. to 1.0 ft.
Effective size med. Uniformity Coefficient n/a

16. WELL GROUTED? ☑ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☑ Bentonite/Cement ☐ Other _____
Depth: From 1.0 ft. to 0.00 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type n/a
Well Disinfected ☐ Yes ☑ No Type: _____ Amount: _____

18. PUMP: Date installed: _____ Not installed ☑
Mfr. Name: _____ Model No.: _____
H.P. _____ Volts _____ Length of drop pipe ____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: Diversified Drilling Service **CERT. NO.:** 1142
Address: (Print) Level: A B C D (circle one) ☑ ☐ ☐ ☐
620 Palmetto st. MT.Pleasant S.C. 29464
Telephone No.: 843-607-2017 Fax No.: 843-884-4604

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: _____ Date: 11/20/04
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (07/2003) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: N.A.V.F.A.C. southern div. (last) (first)
Address: 2155 Eagle dr.
City: North Charleston State: S.C. Zip: 29419-9010
Telephone: Work: (843) 820-7307 Home:

2. LOCATION OF WELL: COUNTY: Chas.
Name: Charleston Navel Complex Bldg.1279
Street Address:
City: North Charleston Zip: 29419-9010
Latitude: 32 51 660" Longitude: 79 58 106"

3. PUBLIC SYSTEM NAME: bldg 1279 **PUBLIC SYSTEM NUMBER:** SB009

4. ABANDONMENT: ☐ Yes ☑ No
Grouted Depth: from _____ ft. to _____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
see attached		
*Indicate Water Bearing Zones (Use a 2nd sheet if needed)		

5. REMARKS:
SB009

6. TYPE: ☐ Mud Rotary ☐ Jetted ☑ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☐ Other

7. PERMIT NUMBER:

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☐ Test Well ☑ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 11/03/04
12.5 ft. Date Completed: 11/03/04

10. CASING: ☑ Threaded ☐ Welded
Diam.: 2"
Type: ☑ PVC ☐ Galvanized ☐ Steel ☐ Other
0.00 in. to 2.5 ft. depth
_____ in. to _____ ft. depth
Height: Above ☐ Below ☐
Surface N/A ft.
Weight N/A lb./ft.
Drive Shoe? ☐ Yes ☑ No

11. SCREEN:
Type: PVC Diam.: 2"
Slot/Gauge: .010 Length: 10.0
Set Between: 2.5 ft. and 12.5 ft.
_____ ft. and _____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☑ No

12. STATIC WATER LEVEL n/a ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
n/a ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☐ No
Yield: _____

14. WATER QUALITY
Chemical Analysis ☑ Yes ☐ No Bacterial Analysis ☐ Yes ☑ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☑ Yes ☐ No
Installed from 12.5 ft. to 1.0 ft.
Effective size med. Uniformity Coefficient n/a

16. WELL GROUTED? ☑ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☑ Bentonite/Cement ☐ Other _____
Depth: From 1.0 ft. to 0.00 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type n/a
Well Disinfected ☐ Yes ☑ No Type: _____ Amount: _____

18. PUMP: Date installed: _____ Not installed ☑
Mfr. Name: _____ Model No.: _____
H.P. _____ Volts _____ Length of drop pipe ___ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: Diversified Drilling Servic **CERT. NO.:** 1142
Address: (Print) Level: A ☑ B ☐ C ☐ D ☐ (circle one)
620 Palmetto st. MT.Pleasant S.C.
29464
Telephone No.: 843-607-2017 Fax No.: 843-884-4604

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: _____ Date: 11/30/04
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (07/2003) **COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)**

APPENDIX C
Chain of Custody and Laboratory Forms

CLIENT : Advent Environmental, Inc.
ADDRESS: 498 Wando Park Blvd
Suite 500
Mt. Pleasant, SC 29464

REPORT # : JAX44569
DATE SUBMITTED: November 13, 2004
DATE REPORTED : November 23, 2004

ATTENTION: Mr. Brian Crawford

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

REFERENCE: 04-511

cnc building 1279

11/11/04

JAX44569-1 : 1279MW009 @ 10:10
JAX44569-2 : 1279MW007 @ 09:55
JAX44569-3 : 1279MW002 @ 10:35
JAX44569-4 : 236MW001 @ 12:46
JAX44569-5 : 236MW002 @ 12:18
JAX44569-6 : 236MW003 @ 13:10

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. This data has been produced in accordance with NELAC Standards (July, 2002). This report shall not be reproduced except in full, without the written approval of the laboratory. Results for these procedures apply only to the samples as submitted.

PROJECT MANAGER _____

Scott D. Martin

ENCO LABORATORIES
REPORT # : JAX44569
DATE REPORTED: November 23, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8011 - EDB & DBCP by GC/ECD	**1279MW009**	**1279MW007**	**Units**
Ethylene Dibromide	0.020 U	0.020 U	ug/L
Dibromochloropropane	0.020 U	0.020 U	ug/L
Date Prepared	11/16/04	11/16/04	
Date Analyzed	11/17/04 18:56	11/17/04 19:09	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44569
DATE REPORTED: November 23, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	**1279MW009**	**1279MW007**	**Units**
Methyl tert-butyl ether	1.0 U	1.0 U	ug/L
Benzene	**10**	**3.5**	ug/L
Toluene	1.0 U	1.0 U	ug/L
Chlorobenzene	1.0 U	1.0 U	ug/L
Ethylbenzene	**16**	**76**	ug/L
m-Xylene & p-Xylene	2.0 U	2.0 U	ug/L
o-Xylene	1.0 U	1.0 U	ug/L
1,3-Dichlorobenzene	1.0 U	1.0 U	ug/L
1,4-Dichlorobenzene	1.0 U	1.0 U	ug/L
1,2-Dichlorobenzene	1.0 U	1.0 U	ug/L
Naphthalene	**22**	**57**	ug/L

Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Dibromofluoromethane	102	103	52-149
D8-Toluene	90	89	70-132
Bromofluorobenzene	92	95	60-135
Date Analyzed	11/20/04 07:58	11/20/04 08:34	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44569
DATE REPORTED: November 23, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	**1279MW009**	**1279MW007**	**Units**
Naphthalene	0.50 U	**15**	ug/L
2-Methylnaphthalene	0.50 U	**11**	ug/L
1-Methylnaphthalene	0.50 U	**6.1**	ug/L
Acenaphthylene	**0.24**	**0.14**	ug/L
Acenaphthene	**0.13**	**3.0**	ug/L
Fluorene	0.10 U	**2.2**	ug/L
Phenanthrene	0.10 U	**1.3**	ug/L
Anthracene	0.10 U	**0.30**	ug/L
Fluoranthene	**0.24**	**0.64**	ug/L
Pyrene	**0.24**	**0.33**	ug/L
Chrysene	0.10 U	0.10 U	ug/L
Benzo(a)anthracene	0.10 U	0.10 U	ug/L
Benzo(b)fluoranthene	0.10 U	0.10 U	ug/L
Benzo(k)fluoranthene	0.10 U	0.10 U	ug/L
Benzo(a)pyrene	0.10 U	0.10 U	ug/L
Indeno(1,2,3-cd)pyrene	0.10 U	0.10 U	ug/L
Dibenzo(a,h)anthracene	0.10 U	0.10 U	ug/L
Benzo(g,h,i)perylene	0.10 U	0.10 U	ug/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
p-Terphenyl	91	85	20-148
Date Prepared	11/15/04	11/15/04	
Date Analyzed	11/16/04 09:50	11/16/04 10:19	

EPA METHOD RSK 175 - Dissolved Gases	**1279MW009**	**1279MW007**	**Units**
Methane	**0.083**	**0.080**	mg/L
Ethene	0.0010 U	0.0010 U	mg/L
Ethane	0.0010 U	0.0010 U	mg/L
Date Analyzed	11/15/04 13:49	11/15/04 13:54	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

MISCELLANEOUS	METHOD	1279MW009	1279MW007	Units
Alkalinity (as CaCO3)	310.1	**140**	**56**	mg/L
Date Analyzed		11/15/04 15:35	11/15/04 15:35	
Dissolved Oxygen	360.1	**9.9** Q	**8.8** Q	mg/L
Date Analyzed		11/15/04 10:40	11/15/04 10:40	
Nitrate-N	353.1	**0.22**	**0.65**	mg/L
Date Analyzed		11/18/04 15:16	11/18/04 15:16	
Nitrite-N	354.1	0.10 U	0.10 U	mg/L
Date Analyzed		11/15/04 12:55	11/15/04 12:55	
Nitrate-Nitrite-N	353.1	**0.26**	**0.65**	mg/L
Date Analyzed		11/18/04 10:15	11/18/04 10:19	
Sulfate, Total	375.4	**10** I	10 U	mg/L
Date Analyzed		11/15/04 16:00	11/15/04 16:00	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Method Quantitation Level (MQL).
Q = Analysis performed outside of method-specified holding time.

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RESULTS OF ANALYSIS

TOTAL METALS	METHOD	1279MW009	1279MW007	Units
Lead	200.7	**0.023**	**0.037**	mg/L
Date Analyzed		11/18/04 18:26	11/18/04 18:33	

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EPA METHOD 8011 - EDB & DBCP by GC/ECD	**1279MW002**	**236MW001**	**Units**
Ethylene Dibromide	0.020 U	0.020 U	ug/L
Dibromochloropropane	0.020 U	0.020 U	ug/L
Date Prepared	11/16/04	11/16/04	
Date Analyzed	11/17/04 19:22	11/17/04 19:35	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	**1279MW002**	**236MW001**	**Units**
Methyl tert-butyl ether	1.0 U	1.0 U	ug/L
Benzene	1.0 U	1.0 U	ug/L
Toluene	1.0 U	1.0 U	ug/L
Chlorobenzene	1.0 U	1.0 U	ug/L
Ethylbenzene	1.0 U	1.0 U	ug/L
m-Xylene & p-Xylene	2.0 U	2.0 U	ug/L
o-Xylene	1.0 U	1.0 U	ug/L
1,3-Dichlorobenzene	1.0 U	1.0 U	ug/L
1,4-Dichlorobenzene	1.0 U	1.0 U	ug/L
1,2-Dichlorobenzene	1.0 U	1.0 U	ug/L
Naphthalene	2.0 U	**75**	ug/L

Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Dibromofluoromethane	102	109	52-149
D8-Toluene	92	92	70-132
Bromofluorobenzene	91	93	60-135
Date Analyzed	11/20/04 09:09	11/20/04 09:45	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	**1279MW002**	**236MW001**	**Units**
Naphthalene	0.50 U	0.50 U	ug/L
2-Methylnaphthalene	0.50 U	0.50 U	ug/L
1-Methylnaphthalene	0.50 U	0.50 U	ug/L
Acenaphthylene	0.10 U	**0.96**	ug/L
Acenaphthene	0.10 U	**7.2**	ug/L
Fluorene	0.10 U	**0.95**	ug/L
Phenanthrene	0.10 U	**0.39**	ug/L
Anthracene	0.10 U	**1.6**	ug/L
Fluoranthene	0.10 U	**9.1**	ug/L
Pyrene	0.10 U	**4.9**	ug/L
Chrysene	0.10 U	0.10 U	ug/L
Benzo(a)anthracene	0.10 U	0.10 U	ug/L
Benzo(b)fluoranthene	0.10 U	0.10 U	ug/L
Benzo(k)fluoranthene	0.10 U	0.10 U	ug/L
Benzo(a)pyrene	0.10 U	0.10 U	ug/L
Indeno(1,2,3-cd)pyrene	0.10 U	0.10 U	ug/L
Dibenzo(a,h)anthracene	0.10 U	0.10 U	ug/L
Benzo(g,h,i)perylene	0.10 U	0.10 U	ug/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
p-Terphenyl	72	72	20-148
Date Prepared	11/15/04	11/15/04	
Date Analyzed	11/16/04 10:48	11/16/04 11:17	

EPA METHOD RSK 175 - Dissolved Gases	**1279MW002**	**236MW001**	**Units**
Methane	**0.016**	**0.016**	mg/L
Ethene	0.0010 U	0.0010 U	mg/L
Ethane	0.0010 U	0.0010 U	mg/L
Date Analyzed	11/15/04 13:58	11/15/04 14:03	

U = Compound was analyzed for but not detected to the level shown.

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MISCELLANEOUS	METHOD	1279MW002	236MW001	Units
Alkalinity (as CaCO3)	310.1	**66**	**250**	mg/L
Date Analyzed		11/15/04 15:35	11/15/04 15:35	
Dissolved Oxygen	360.1	**9.3** Q	**9.7** Q	mg/L
Date Analyzed		11/15/04 10:40	11/15/04 10:40	
Nitrate-N	353.1	**0.48**	**0.91**	mg/L
Date Analyzed		11/18/04 15:16	11/18/04 15:16	
Nitrite-N	354.1	0.10 U	0.10 U	mg/L
Date Analyzed		11/15/04 12:55	11/15/04 12:55	
Nitrate-Nitrite-N	353.1	**0.48**	**0.91**	mg/L
Date Analyzed		11/18/04 10:20	11/18/04 10:56	
Sulfate, Total	375.4	**8.0** I	**110**	mg/L
Date Analyzed		11/15/04 16:00	11/15/04 16:00	

TOTAL METALS	METHOD	1279MW002	236MW001	Units
Lead	200.7	**0.029**	0.010 U	mg/L
Date Analyzed		11/18/04 18:40	11/18/04 18:47	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Method Quantitation Level (MQL).
Q = Analysis performed outside of method-specified holding time.

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EPA METHOD 8011 - EDB & DBCP by GC/ECD	**236MW002**	**236MW003**	**Units**
Ethylene Dibromide	0.020 U	0.020 U	ug/L
Dibromochloropropane	0.020 U	0.020 U	ug/L
Date Prepared	11/16/04	11/16/04	
Date Analyzed	11/17/04 19:48	11/17/04 20:01	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	**236MW002**	**236MW003**	**Units**
Methyl tert-butyl ether	1.0 U	1.0 U	ug/L
Benzene	1.0 U	1.0 U	ug/L
Toluene	1.0 U	1.0 U	ug/L
Chlorobenzene	1.0 U	1.0 U	ug/L
Ethylbenzene	1.0 U	1.0 U	ug/L
m-Xylene & p-Xylene	2.0 U	2.0 U	ug/L
o-Xylene	1.0 U	1.0 U	ug/L
1,3-Dichlorobenzene	1.0 U	1.0 U	ug/L
1,4-Dichlorobenzene	1.0 U	1.0 U	ug/L
1,2-Dichlorobenzene	1.0 U	1.0 U	ug/L
Naphthalene	**2.1**	2.0 U	ug/L

Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Dibromofluoromethane	110	105	52-149
D8-Toluene	92	98	70-132
Bromofluorobenzene	95	90	60-135
Date Analyzed	11/20/04 10:21	11/20/04 10:56	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	**236MW002**	**236MW003**	**Units**
Naphthalene	0.50 U	0.50 U	ug/L
2-Methylnaphthalene	0.50 U	0.50 U	ug/L
1-Methylnaphthalene	0.50 U	0.50 U	ug/L
Acenaphthylene	0.10 U	0.10 U	ug/L
Acenaphthene	0.10 U	0.10 U	ug/L
Fluorene	0.10 U	0.10 U	ug/L
Phenanthrene	0.10 U	0.10 U	ug/L
Anthracene	0.10 U	0.10 U	ug/L
Fluoranthene	0.10 U	0.10 U	ug/L
Pyrene	0.10 U	0.10 U	ug/L
Chrysene	0.10 U	0.10 U	ug/L
Benzo(a)anthracene	0.10 U	0.10 U	ug/L
Benzo(b)fluoranthene	0.10 U	0.10 U	ug/L
Benzo(k)fluoranthene	0.10 U	0.10 U	ug/L
Benzo(a)pyrene	0.10 U	0.10 U	ug/L
Indeno(1,2,3-cd)pyrene	0.10 U	0.10 U	ug/L
Dibenzo(a,h)anthracene	0.10 U	0.10 U	ug/L
Benzo(g,h,i)perylene	0.10 U	0.10 U	ug/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
p-Terphenyl	73	78	20-148
Date Prepared	11/15/04	11/15/04	
Date Analyzed	11/16/04 11:46	11/16/04 12:15	

EPA METHOD RSK 175 - Dissolved Gases	**236MW002**	**236MW003**	**Units**
Methane	**0.0012**	**0.0025**	mg/L
Ethene	0.0010 U	0.0010 U	mg/L
Ethane	0.0010 U	0.0010 U	mg/L
Date Analyzed	11/15/04 14:08	11/15/04 14:12	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

MISCELLANEOUS	METHOD	236MW002	236MW003	Units
Alkalinity (as CaCO3)	310.1	**170**	**440**	mg/L
Date Analyzed		11/15/04 15:35	11/15/04 15:35	
Dissolved Oxygen	360.1	**11** Q	**9.9** Q	mg/L
Date Analyzed		11/15/04 10:40	11/15/04 10:40	
Nitrate-N	353.1	**0.61**	**0.19**	mg/L
Date Analyzed		11/18/04 15:16	11/18/04 15:16	
Nitrite-N	354.1	0.10 U	0.10 U	mg/L
Date Analyzed		11/15/04 12:55	11/15/04 12:55	
Nitrate-Nitrite-N	353.1	**0.61**	**0.19**	mg/L
Date Analyzed		11/18/04 10:22	11/18/04 10:23	
Sulfate, Total	375.4	**80**	**190**	mg/L
Date Analyzed		11/15/04 16:00	11/15/04 16:00	

U = Compound was analyzed for but not detected to the level shown.
Q = Analysis performed outside of method-specified holding time.

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RESULTS OF ANALYSIS

TOTAL METALS	METHOD	236MW002	236MW003	Units
Arsenic	200.7	0.010 U	NA	mg/L
Date Analyzed		11/18/04 18:06		
Barium	200.7	0.10 U	NA	mg/L
Date Analyzed		11/18/04 18:06		
Calcium	200.7	**79**	NA	mg/L
Date Analyzed		11/18/04 18:06		
Chromium	200.7	0.010 U	NA	mg/L
Date Analyzed		11/18/04 18:06		
Lead	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		11/18/04 18:06	11/18/04 18:54	
Selenium	200.7	0.010 U	NA	mg/L
Date Analyzed		11/18/04 18:06		
Silver	200.7	0.010 U	NA	mg/L
Date Analyzed		11/18/04 18:06		
Mercury	245.1	0.00020 U	NA	mg/L
Date Analyzed		11/24/04 16:30		

NA = Analysis not applicable for this sample.
U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8011 - EDB & DBCP by GC/ECD	**LAB BLANK**	**Units**
Ethylene Dibromide	0.020 U	ug/L
Dibromochloropropane	0.020 U	ug/L
Date Prepared	11/16/04	
Date Analyzed	11/17/04 14:10	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	**LAB BLANK**	**Units**
Methyl tert-butyl ether	1.0 U	ug/L
Benzene	1.0 U	ug/L
Toluene	1.0 U	ug/L
Chlorobenzene	1.0 U	ug/L
Ethylbenzene	1.0 U	ug/L
m-Xylene & p-Xylene	2.0 U	ug/L
o-Xylene	1.0 U	ug/L
1,3-Dichlorobenzene	1.0 U	ug/L
1,4-Dichlorobenzene	1.0 U	ug/L
1,2-Dichlorobenzene	1.0 U	ug/L

Surrogate:	**% RECOV**	**LIMITS**
Dibromofluoromethane	107	52-149
D8-Toluene	90	70-132
Bromofluorobenzene	91	60-135
Date Analyzed	11/20/04 07:23	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	**LAB BLANK**	**Units**
Naphthalene	0.50 U	ug/L
2-Methylnaphthalene	0.50 U	ug/L
1-Methylnaphthalene	0.50 U	ug/L
Acenaphthylene	0.10 U	ug/L
Acenaphthene	0.10 U	ug/L
Fluorene	0.10 U	ug/L
Phenanthrene	0.10 U	ug/L
Anthracene	0.10 U	ug/L
Fluoranthene	0.10 U	ug/L
Pyrene	0.10 U	ug/L
Chrysene	0.10 U	ug/L
Benzo(a)anthracene	0.10 U	ug/L
Benzo(b)fluoranthene	0.10 U	ug/L
Benzo(k)fluoranthene	0.10 U	ug/L
Benzo(a)pyrene	0.10 U	ug/L
Indeno(1,2,3-cd)pyrene	0.10 U	ug/L
Dibenzo(a,h)anthracene	0.10 U	ug/L
Benzo(g,h,i)perylene	0.10 U	ug/L
Surrogate:	**% RECOV**	**LIMITS**
p-Terphenyl	74	20-148
Date Prepared	11/15/04	
Date Analyzed	11/16/04 04:35	

EPA METHOD RSK 175 - Dissolved Gases	**LAB BLANK**	**Units**
Methane	0.0010 U	mg/L
Ethene	0.0010 U	mg/L
Ethane	0.0010 U	mg/L
Date Analyzed	11/15/04 12:02	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

MISCELLANEOUS	METHOD	LAB BLANK	Units
Alkalinity (as CaCO3)	310.1	2.0 U	mg/L
Date Analyzed		11/15/04 15:35	
Nitrite-N	354.1	0.10 U	mg/L
Date Analyzed		11/15/04 12:55	
Nitrate-Nitrite-N	353.1	0.10 U	mg/L
Date Analyzed		11/18/04 10:04	
Sulfate, Total	375.4	1.0 U	mg/L
Date Analyzed		11/15/04 16:00	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

TOTAL METALS	METHOD	LAB BLANK	Units
Arsenic	200.7	0.010 U	mg/L
Date Analyzed		11/18/04 17:53	
Barium	200.7	0.10 U	mg/L
Date Analyzed		11/18/04 17:53	
Calcium	200.7	0.50 U	mg/L
Date Analyzed		11/18/04 17:53	
Chromium	200.7	0.010 U	mg/L
Date Analyzed		11/18/04 17:53	
Lead	200.7	0.010 U	mg/L
Date Analyzed		11/18/04 17:53	
Selenium	200.7	0.010 U	mg/L
Date Analyzed		11/18/04 17:53	
Silver	200.7	0.010 U	mg/L
Date Analyzed		11/18/04 17:53	
Mercury	245.1	0.00020 U	mg/L
Date Analyzed		11/24/04 16:20	

U = Compound was analyzed for but not detected to the level shown.

LABORATORY CERTIFICATIONS

Laboratory Certification: SCDHEC:96009001

All analyses reported with this project were analyzed by the facility indicated unless identified below.

PARAMETER	LAB CERT #'s
EDB & DBCP, SW-846 Method 8011	SCDHEC:96002001
Nitrogen, Nitrate, EPA Method 353.1	SCDHEC:96002001
Nitrogen, NO3-NO2, EPA Method 353.1	SCDHEC:96002001

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QUALITY CONTROL DATA

Parameter	% RECOVERY LCS/MS/MSD	LCS LIMITS	MS/MSD LIMITS	RPD MS/MSD	RPD LIMITS
EPA Method 8011					
Ethylene Dibromide	88/ 92/ 96	53-154	57-130	4	18
Dibromochloropropane	84/ 84/ 88	38-163	60-130	5	20
EPA Method 8260					
1,1-Dichloroethene	93/ 82/ 83	58-149	40-155	1	30
Benzene	117/103/106	62-135	70-131	3	23
Trichloroethene	110/ 93/ 98	66-136	68-128	5	10
Toluene	110/ 91/ 94	72-126	84-116	3	12
Chlorobenzene	113/ 96/100	77-124	88-123	4	11
EPA Method 8270					
Naphthalene	63/ 67/ 64	32-86	30-112	4	28
Acenaphthene	72/ 74/ 72	47-90	28-113	3	32
Benzo(a)pyrene	73/ 70/ 74	39-129	39-148	6	38
Benzo(g,h,i)perylene	41/ 40/ 38	8-142	20-130	5	43
EPA Method RSK 175					
Methane	106/ NA/ NA	57-135	57-154	NA	24
Ethene	100/ NA/ NA	52-126	48-138	NA	21
Ethane	104/ NA/ NA	59-141	61-149	NA	22
MISCELLANEOUS					
Alkalinity (as CaCO3), 310.	98/104/104	89-123	73-126	<1	11
Nitrite-N, 354.1	116/ 95/ 95	50-150	69-124	<1	13
Nitrate-Nitrite-N, 353.1	101/104/ 97	90-112	61-144	7	21
Sulfate, Total, 375.4	103/104/107	44-149	61-138	3	22

< = Less Than

MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

ENCO LABORATORIES
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QUALITY CONTROL DATA

Parameter	% RECOVERY LCS/MS/MSD	LCS LIMITS	MS/MSD LIMITS	RPD MS/MSD	RPD LIMITS
TOTAL METALS					
Arsenic, 200.7	101/101/103	85-120	64-126	2	12
Barium, 200.7	98/ 96/ 97	80-120	74-119	1	11
Calcium, 200.7	99/ 83/ 93	88-116	63-131	11	22
Chromium, 200.7	98/ 98/ 99	89-120	73-120	1	10
Lead, 200.7	99/ 97/ 98	82-117	68-126	1	19
Selenium, 200.7	100/ 99/100	83-118	65-129	1	10
Silver, 200.7	94/ 94/ 95	51-144	69-121	1	12
Mercury, 245.1	104/103/104	81-126	70-136	<1	12

< = Less Than
MS = Matrix Spike
MSD = Matrix Spike Duplicate

LCS = Laboratory Control Standard
RPD = Relative Percent Difference

QSARF #_____

ENVIRONMENTAL CONSERVATION LABORATORIES

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ENCO CompQAP No.: 960038G/0

CHAIN OF CUSTODY RECORD

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER
CNC building 1279	04-511	04-511

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE / FAX
FL	James Weeg	(843) 388-1851 / (843) 388-1891

CLIENT NAME	CLIENT PROJECT MANAGER
Advent Environmental, Inc.	Mr. Brian Crawford

CLIENT ADDRESS (CITY, STATE, ZIP): 498 Wando Park Blvd Suite 500 Mt. Pleasant, SC 29464

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☐ EXPEDITED REPORT DELIVERY (surcharge)

Date Due: _____

STATION	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION	SURFACE WATER	GROUND WATER	WASTEWATER	DRINKING WATER	SOIL/SOLID/SEDIMENT	NONAQUEOUS LIQUID (oil, solvent, etc.)	AIR	SLUDGE	OTHER	8260	8270/PAH/SIM	DRO, PERCENT SOL	~~PCB's~~ TPC (TOTAL PETROLEUM CONTAMINANTS)	6011	NITRATES/SO4, 1/CALC, NO3-N 3.1	PB	REMARKS
															PRESERVATIVE							
						NUMBER OF CONTAINERS SUBMITTED																
1 CNC	11/2/04	0900		X	SB001-01					X					3	1						
2 CNC	11/2/04	0900		X	SB002-01					X					3	1						
3 CNC	11/2/04	0900		X	SB003-01					X					3	1						
4 CNC	11/2/04	0900		X	SB004-01					X					3	1						
5 CNC	11/2/04	0900		X	SB005-01					X					3	1						
6 CNC	11/2/04	0900		X	SB006-01					X					3	1						
7 CNC	11/2/04	0900		X	SB007-01					X					3	1						
8 CNC	11/2/04	0900		X	SB008-01					X					3	1						
9 CNC	11/2/04	0900		X	SB007-01					X							1					
10 CNC	11/2/04	0900		X	SB007-01		~~X~~			X					~~2~~	~~1~~		~~1~~	~~2~~	~~2~~	~~1~~	~~1~~
11							X								2	1		2	3	2	1	1
12							X								2	1		2	3	2	1	1
13																						
14																						

SAMPLE KIT PREPARED BY:	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
☒ JACKSONVILLE ☐ ORLANDO	6/29/04	1525						
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	ENCO LOG NO.	REMARKS
☐ Jacksonville ☒ Orlando	11/5/04	9:40	☒ YES ☐ NO	JAX44394	

Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
www.encolabs.com

ENCO Laboratories

DHRS Certification No. E82277

CLIENT : Advent Environmental, Inc.
ADDRESS: 498 Wando Park Blvd
Suite 500
Mt. Pleasant, SC 29464

REPORT # : JAX44394
DATE SUBMITTED: November 5, 2004
DATE REPORTED : November 15, 2004

ATTENTION: Mr. Brian Crawford

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

REFERENCE: 04-511

cnc building 1279

*JAX44394-1	: SB001-01 @ 09:00	(11/02/04)
*JAX44394-2	: SB002-01 @ 09:00	(11/02/04)
*JAX44394-3	: SB003-01 @ 09:00	(11/02/04)
*JAX44394-4	: SB004-01 @ 09:00	(11/02/04)
*JAX44394-5	: SB005-01 @ 09:00	(11/02/04)
*JAX44394-6	: SB006-01 @ 09:00	(11/02/04)
*JAX44394-7	: SB007-01 @ 09:00	(11/02/04)
*JAX44394-8	: SB008-01 @ 09:00	(11/02/04)
JAX44394-9	: SB007-01 @ 09:00	(11/02/04)
JAX44394-10	: SB007-01 @ 09:00	(11/02/04)
JAX44394-11	: SB009-01 @ 08:05	(11/03/04)

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. This data has been produced in accordance with NELAC Standards (July, 2002). This report shall not be reproduced except in full, without the written approval of the laboratory. Results for these procedures apply only to the samples as submitted.

Note: Analytical values are reported on a dry weight basis.
* 8260's were received out of hold protocol and also in improper containers.

PROJECT MANAGER Scott D. Martin

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	SB001-01	Units
Benzene	0.90 U D1	ug/Kg
Toluene	0.90 U D1	ug/Kg
Ethylbenzene	**4.0** D1	ug/Kg
m-Xylene & p-Xylene	1.8 U D1	ug/Kg
o-Xylene	0.90 U D1	ug/Kg
Naphthalene	**2.5** D1	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	95	61-128
D8-Toluene	90	77-119
Bromofluorobenzene	91	60-130
Date Prepared	11/11/04 18:00	
Date Analyzed	11/12/04 00:43	

U = Compound was analyzed for but not detected to the level shown.
D1 = Analyte value determined from a 1:78 dilution.

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	SB001-01	Units
Naphthalene	38 U	ug/Kg
2-Methylnaphthalene	38 U	ug/Kg
1-Methylnaphthalene	38 U	ug/Kg
Acenaphthylene	38 U	ug/Kg
Acenaphthene	38 U	ug/Kg
Fluorene	38 U	ug/Kg
Phenanthrene	38 U	ug/Kg
Anthracene	38 U	ug/Kg
Fluoranthene	38 U	ug/Kg
Pyrene	38 U	ug/Kg
Chrysene	38 U	ug/Kg
Benzo(a)anthracene	38 U	ug/Kg
Benzo(b)fluoranthene	38 U	ug/Kg
Benzo(k)fluoranthene	38 U	ug/Kg
Benzo(a)pyrene	38 U	ug/Kg
Indeno(1,2,3-cd)pyrene	38 U	ug/Kg
Dibenzo(a,h)anthracene	38 U	ug/Kg
Benzo(g,h,i)perylene	38 U	ug/Kg

Surrogate:	% RECOV	LIMITS
p-Terphenyl	109	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 18:04	

Miscellaneous	METHOD	SB001-01	Units
Percent Solids	WETS/72	87	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	SB002-01	Units
Benzene	0.84 U D2	ug/Kg
Toluene	0.80 U D2	ug/Kg
Ethylbenzene	0.80 U D2	ug/Kg
m-Xylene & p-Xylene	1.7 U D2	ug/Kg
o-Xylene	0.84 U D2	ug/Kg
Naphthalene	0.80 U D2	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	94	61-128
D8-Toluene	89	77-119
Bromofluorobenzene	89	60-130
Date Prepared	11/11/04 18:00	
Date Analyzed	11/12/04 01:19	

U = Compound was analyzed for but not detected to the level shown.
D2 = Analyte value determined from a 1:71 dilution.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	SB002-01	Units
Naphthalene	40 U	ug/Kg
2-Methylnaphthalene	40 U	ug/Kg
1-Methylnaphthalene	40 U	ug/Kg
Acenaphthylene	40 U	ug/Kg
Acenaphthene	40 U	ug/Kg
Fluorene	40 U	ug/Kg
Phenanthrene	80	ug/Kg
Anthracene	40 U	ug/Kg
Fluoranthene	200	ug/Kg
Pyrene	170	ug/Kg
Chrysene	75	ug/Kg
Benzo(a)anthracene	83	ug/Kg
Benzo(b)fluoranthene	90	ug/Kg
Benzo(k)fluoranthene	40 U	ug/Kg
Benzo(a)pyrene	56	ug/Kg
Indeno(1,2,3-cd)pyrene	40 U	ug/Kg
Dibenzo(a,h)anthracene	40 U	ug/Kg
Benzo(g,h,i)perylene	48	ug/Kg
Surrogate:	**% RECOV**	**LIMITS**
p-Terphenyl	96	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 18:33	

Miscellaneous	METHOD	SB002-01	Units
Percent Solids	WETS/72	84	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	SB003-01		Units
Benzene	1.0 U	D3	ug/Kg
Toluene	1.0 U	D3	ug/Kg
Ethylbenzene	4.0	D3	ug/Kg
m-Xylene & p-Xylene	2.0 U	D3	ug/Kg
o-Xylene	1.0 U	D3	ug/Kg
Naphthalene	17	D3	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	98	61-128
D8-Toluene	85	77-119
Bromofluorobenzene	91	60-130
Date Prepared	11/11/04 18:00	
Date Analyzed	11/12/04 01:55	

U = Compound was analyzed for but not detected to the level shown.
D3 = Analyte value determined from a 1:82 dilution.
D3 = Analyte value determined from a 1:82 dilution.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	SB003-01	Units
Naphthalene	52	ug/Kg
2-Methylnaphthalene	41 U	ug/Kg
1-Methylnaphthalene	41 U	ug/Kg
Acenaphthylene	41 U	ug/Kg
Acenaphthene	41 U	ug/Kg
Fluorene	41 U	ug/Kg
Phenanthrene	41 U	ug/Kg
Anthracene	41 U	ug/Kg
Fluoranthene	41 U	ug/Kg
Pyrene	41 U	ug/Kg
Chrysene	41 U	ug/Kg
Benzo(a)anthracene	41 U	ug/Kg
Benzo(b)fluoranthene	41 U	ug/Kg
Benzo(k)fluoranthene	41 U	ug/Kg
Benzo(a)pyrene	41 U	ug/Kg
Indeno(1,2,3-cd)pyrene	41 U	ug/Kg
Dibenzo(a,h)anthracene	41 U	ug/Kg
Benzo(g,h,i)perylene	41 U	ug/Kg

Surrogate:	% RECOV	LIMITS
p-Terphenyl	104	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 19:02	

Miscellaneous	METHOD	SB003-01	Units
Percent Solids	WETS/72	82	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : onc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	SB004-01	Units
Benzene	22	ug/Kg
Toluene	2.2	ug/Kg
Ethylbenzene	32	ug/Kg
m-Xylene & p-Xylene	2.8	ug/Kg
o-Xylene	1.0 U	ug/Kg
Naphthalene	1.4	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	91	61-128
D8-Toluene	89	77-119
Bromofluorobenzene	82	60-130
Date Prepared	11/11/04 18:00	
Date Analyzed	11/12/04 02:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	SB004-01	Units
Naphthalene	92	ug/Kg
2-Methylnaphthalene	51	ug/Kg
1-Methylnaphthalene	42 U	ug/Kg
Acenaphthylene	42 U	ug/Kg
Acenaphthene	42 U	ug/Kg
Fluorene	42 U	ug/Kg
Phenanthrene	67	ug/Kg
Anthracene	42 U	ug/Kg
Fluoranthene	51	ug/Kg
Pyrene	42 U	ug/Kg
Chrysene	54	ug/Kg
Benzo(a)anthracene	42 U	ug/Kg
Benzo(b)fluoranthene	42 U	ug/Kg
Benzo(k)fluoranthene	42 U	ug/Kg
Benzo(a)pyrene	42 U	ug/Kg
Indeno(1,2,3-cd)pyrene	42 U	ug/Kg
Dibenzo(a,h)anthracene	42 U	ug/Kg
Benzo(g,h,i)perylene	42 U	ug/Kg
Surrogate:	**% RECOV**	**LIMITS**
p-Terphenyl	106	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 19:30	

Miscellaneous	METHOD	SB004-01	Units
Percent Solids	WETS/72	79	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	SB005-01		Units
Benzene	0.98 U	D4	ug/Kg
Toluene	1.0 U	D4	ug/Kg
Ethylbenzene	16	D4	ug/Kg
m-Xylene & p-Xylene	2.0 U	D4	ug/Kg
o-Xylene	0.98 U	D4	ug/Kg
Naphthalene	2.8	D4	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	94	61-128
D8-Toluene	89	77-119
Bromofluorobenzene	84	60-130
Date Prepared	11/11/04 18:00	
Date Analyzed	11/12/04 03:06	

U = Compound was analyzed for but not detected to the level shown.
D4 = Analyte value determined from a 1:88 dilution.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	SB005-01	Units
Naphthalene	70	ug/Kg
2-Methylnaphthalene	37 U	ug/Kg
1-Methylnaphthalene	37 U	ug/Kg
Acenaphthylene	37 U	ug/Kg
Acenaphthene	37 U	ug/Kg
Fluorene	37 U	ug/Kg
Phenanthrene	70	ug/Kg
Anthracene	37 U	ug/Kg
Fluoranthene	180	ug/Kg
Pyrene	140	ug/Kg
Chrysene	130	ug/Kg
Benzo(a)anthracene	78	ug/Kg
Benzo(b)fluoranthene	110	ug/Kg
Benzo(k)fluoranthene	37 U	ug/Kg
Benzo(a)pyrene	44	ug/Kg
Indeno(1,2,3-cd)pyrene	37 U	ug/Kg
Dibenzo(a,h)anthracene	37 U	ug/Kg
Benzo(g,h,i)perylene	37 U	ug/Kg

Surrogate:	% RECOV	LIMITS
p-Terphenyl	108	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 19:59	

Miscellaneous	METHOD	SB005-01	Units
Percent Solids	WETS/72	90	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	SB006-01		Units
Benzene	2.0	D5	ug/Kg
Toluene	1.2 U	D5	ug/Kg
Ethylbenzene	50	D5	ug/Kg
m-Xylene & p-Xylene	2.6 U	D5	ug/Kg
o-Xylene	1.2 U	D5	ug/Kg
Naphthalene	2.0	D5	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	94	61-128
D8-Toluene	88	77-119
Bromofluorobenzene	76	60-130
Date Prepared	11/11/04 18:00	
Date Analyzed	11/12/04 03:41	

U = Compound was analyzed for but not detected to the level shown.
D5 = Analyte value determined from a 1:1.14 dilution.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	SB006-01	Units
Naphthalene	240	ug/Kg
2-Methylnaphthalene	190	ug/Kg
1-Methylnaphthalene	130	ug/Kg
Acenaphthylene	37 U	ug/Kg
Acenaphthene	37 U	ug/Kg
Fluorene	37 U	ug/Kg
Phenanthrene	510	ug/Kg
Anthracene	100	ug/Kg
Fluoranthene	530	ug/Kg
Pyrene	420	ug/Kg
Chrysene	330	ug/Kg
Benzo(a)anthracene	220	ug/Kg
Benzo(b)fluoranthene	290	ug/Kg
Benzo(k)fluoranthene	100	ug/Kg
Benzo(a)pyrene	170	ug/Kg
Indeno(1,2,3-cd)pyrene	110	ug/Kg
Dibenzo(a,h)anthracene	41	ug/Kg
Benzo(g,h,i)perylene	130	ug/Kg
Surrogate:	**% RECOV**	**LIMITS**
p-Terphenyl	108	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 20:28	

Miscellaneous	METHOD	SB006-01	Units
Percent Solids	WETS/72	90	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	SB007-01	Units
Benzene	120 U D6	ug/Kg
Toluene	120 U D6	ug/Kg
Ethylbenzene	5600 D6	ug/Kg
m-Xylene & p-Xylene	230 U D6	ug/Kg
o-Xylene	120 U D6	ug/Kg
Naphthalene	11000 D6	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	88	61-128
D8-Toluene	99	77-119
Bromofluorobenzene	103	60-130
Date Analyzed	11/10/04 10:42	

U = Compound was analyzed for but not detected to the level shown.
D6 = Analyte value determined from a 1:100 dilution.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	SB007-01	Units
Naphthalene	10000	ug/Kg
2-Methylnaphthalene	10000	ug/Kg
1-Methylnaphthalene	4900	ug/Kg
Acenaphthylene	93	ug/Kg
Acenaphthene	1700	ug/Kg
Fluorene	1900	ug/Kg
Phenanthrene	3700	ug/Kg
Anthracene	640	ug/Kg
Fluoranthene	3000	ug/Kg
Pyrene	2100	ug/Kg
Chrysene	640	ug/Kg
Benzo(a)anthracene	630	ug/Kg
Benzo(b)fluoranthene	440	ug/Kg
Benzo(k)fluoranthene	160	ug/Kg
Benzo(a)pyrene	270	ug/Kg
Indeno(1,2,3-cd)pyrene	110	ug/Kg
Dibenzo(a,h)anthracene	39 U	ug/Kg
Benzo(g,h,i)perylene	110	ug/Kg
Surrogate:	**% RECOV**	**LIMITS**
p-Terphenyl	109	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 20:56	

Miscellaneous	METHOD	SB007-01	Units
Percent Solids	WETS/72	86	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	SB008-01	Units
Benzene	1.0 U D7	ug/Kg
Toluene	1.0 U D7	ug/Kg
Ethylbenzene	8.7 D7	ug/Kg
m-Xylene & p-Xylene	2.0 U D7	ug/Kg
o-Xylene	1.0 U D7	ug/Kg
Naphthalene	4.0 D7	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	94	61-128
D8-Toluene	93	77-119
Bromofluorobenzene	92	60-130
Date Prepared	11/11/04 18:00	
Date Analyzed	11/12/04 04:17	

U = Compound was analyzed for but not detected to the level shown.
D7 = Analyte value determined from a 1:1.02 dilution.

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	SB008-01	Units
Naphthalene	44	ug/Kg
2-Methylnaphthalene	39 U	ug/Kg
1-Methylnaphthalene	39 U	ug/Kg
Acenaphthylene	39 U	ug/Kg
Acenaphthene	39 U	ug/Kg
Fluorene	39 U	ug/Kg
Phenanthrene	39 U	ug/Kg
Anthracene	39 U	ug/Kg
Fluoranthene	39 U	ug/Kg
Pyrene	39 U	ug/Kg
Chrysene	39 U	ug/Kg
Benzo(a)anthracene	39 U	ug/Kg
Benzo(b)fluoranthene	39 U	ug/Kg
Benzo(k)fluoranthene	39 U	ug/Kg
Benzo(a)pyrene	39 U	ug/Kg
Indeno(1,2,3-cd)pyrene	39 U	ug/Kg
Dibenzo(a,h)anthracene	39 U	ug/Kg
Benzo(g,h,i)perylene	39 U	ug/Kg
Surrogate:	**% RECOV**	**LIMITS**
p-Terphenyl	102	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 21:25	

Miscellaneous	METHOD	SB008-01	Units
Percent Solids	WETS/72	85	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8015 MODIFIED - DIESEL RANGE ORGANICS	SB007-01	Units
DRO (C10-C24)	220	mg/Kg
Surrogate:	**% RECOV**	**LIMITS**
m-Terphenyl	103	D-183
Date Prepared	11/10/04	
Date Analyzed	11/12/04 15:51	

Miscellaneous	METHOD	SB007-01	Units
Percent Solids	WETS/72	79	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

Miscellaneous	METHOD	SB007-01	Units
Percent Solids	WETS/72	77	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

MISCELLANEOUS	METHOD	SB007-01	Units
Total Org. Carbon	CE-81-1/9060	39 U	mg/Kg
Date Analyzed		11/12/04 17:00	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

Miscellaneous	METHOD	~~SB009~~-01 SB008	Units
Percent Solids	WETS/72	92	%
Date Prepared		11/10/04	
Date Analyzed		11/11/04 10:30	

MISCELLANEOUS	METHOD	~~SB009~~-01	Units
Total Org. Carbon	CE-81-1/9060	33 U	mg/Kg
Date Analyzed		11/12/04 17:00	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
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RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	LAB BLANK	Units
Benzene	100 U D6	ug/Kg
Toluene	100 U D6	ug/Kg
Ethylbenzene	100 U D6	ug/Kg
m-Xylene & p-Xylene	200 U D6	ug/Kg
o-Xylene	100 U D6	ug/Kg
Naphthalene	100 U D6	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	92	61-128
D8-Toluene	98	77-119
Bromofluorobenzene	92	60-130
Date Analyzed	11/10/04 02:24	

U = Compound was analyzed for but not detected to the level shown.
D6 = Analyte value determined from a 1:100 dilution.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds by SIM	LAB BLANK	Units
Naphthalene	33 U	ug/Kg
2-Methylnaphthalene	33 U	ug/Kg
1-Methylnaphthalene	33 U	ug/Kg
Acenaphthylene	33 U	ug/Kg
Acenaphthene	33 U	ug/Kg
Fluorene	33 U	ug/Kg
Phenanthrene	33 U	ug/Kg
Anthracene	33 U	ug/Kg
Fluoranthene	33 U	ug/Kg
Pyrene	33 U	ug/Kg
Chrysene	33 U	ug/Kg
Benzo(a)anthracene	33 U	ug/Kg
Benzo(b)fluoranthene	33 U	ug/Kg
Benzo(k)fluoranthene	33 U	ug/Kg
Benzo(a)pyrene	33 U	ug/Kg
Indeno(1,2,3-cd)pyrene	33 U	ug/Kg
Dibenzo(a,h)anthracene	33 U	ug/Kg
Benzo(g,h,i)perylene	33 U	ug/Kg

Surrogate:	% RECOV	LIMITS
p-Terphenyl	103	19-162
Date Prepared	11/09/04	
Date Analyzed	11/11/04 16:09	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
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RESULTS OF ANALYSIS

EPA METHOD 8015 MODIFIED - DIESEL RANGE ORGANICS	LAB BLANK	Units
DRO (C10-C24)	3.3 U	mg/Kg
Surrogate:	**% RECOV**	**LIMITS**
m-Terphenyl	93	D-183
Date Prepared	11/10/04	
Date Analyzed	11/12/04 14:27	

MISCELLANEOUS	METHOD	LAB BLANK	Units
Total Org. Carbon	CE-81-1/9060	10 U	mg/Kg
Date Analyzed		11/12/04 17:00	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	LAB BLANK	Units
Benzene	1.0 U	ug/Kg
Toluene	1.0 U	ug/Kg
Ethylbenzene	1.0 U	ug/Kg
m-Xylene & p-Xylene	2.0 U	ug/Kg
o-Xylene	1.0 U	ug/Kg
Naphthalene	1.0 U	ug/Kg

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	98	61-128
D8-Toluene	90	77-119
Bromofluorobenzene	89	60-130
Date Analyzed	11/11/04 19:23	

U = Compound was analyzed for but not detected to the level shown.

LABORATORY CERTIFICATIONS

Laboratory Certification: SCDHEC:96009001

All analyses reported with this project were analyzed by the facility indicated unless identified below.

ENCO LABORATORIES
REPORT # : JAX44394
DATE REPORTED: November 15, 2004
REFERENCE : 04-511
PROJECT NAME : cnc building 1279

QUALITY CONTROL DATA

Parameter	% RECOVERY LCS/MS/MSD	LCS LIMITS	MS/MSD LIMITS	RPD MS/MSD	RPD LIMITS
EPA Method 8260					
1,1-Dichloroethene	69/ 61/ 59	59-144	19-161	3	19
Benzene	98/ 97/ 92	67-150	60-129	5	23
Trichloroethene	102/ 99/ 92	69-137	56-132	7	17
Toluene	96/ 94/ 87	72-124	53-129	8	22
Chlorobenzene	106/104/ 96	75-125	61-136	8	24
1,1-Dichloroethene	60/ 54/ 54	59-144	19-161	<1	19
Benzene	90/ 93/ 88	67-150	60-129	6	23
Trichloroethene	92/ 95/ 91	69-137	56-132	4	17
Toluene	92/ 94/ 94	72-124	53-129	<1	22
Chlorobenzene	103/102/103	75-125	61-136	<1	24
EPA Method 8270					
Naphthalene	77/ 80/ 81	48-88	20-131	1	29
Acenaphthene	86/ 88/ 90	57-96	24-132	2	23
Benzo(a)pyrene	74/ 82/ 86	37-134	34-140	5	28
Benzo(g,h,i)perylene	70/ 86/ 76	11-145	31-152	12	21
EPA Method 8015 MODIFIED					
DRO (C10-C24)	91/ 90/ 84	25-129	14-162	7	31
MISCELLANEOUS					
Total Org. Carbon, CE-81-1/	91/100/ 97	70-132	49-130	3	18

< = Less Than
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

APPENDIX D
Slug Test Data Form

U.S. Environmental Protection Agency

EPA On-line Tools for Site Assessment Calculation

Hydraulic Gradient Calculation

Hydraulic Gradient

Hydraulic Gradient $i = (h_2 - h_1)/d$

i = Hydraulic Gradient [L/L]
h_1 = Upgradient Head [L]
h_2 = Downgradient Head [L]
d = Distance Between Wells [L]

Example Data | Calculate | Clear
Save Data | Recall Data | Go Back

Site Name	Bldg 1279
Date	1/3/2005 Current Date
Distance Unit	ft
Distance Between Wells	50.00
Head Unit	ft
Upgradient Water Level (h_1)	4.250
Downgradient Water Level (h_2)	3.250
Gradient (i)	-0.0200

Page author: Jim Weaver, of U.S. EPA, Office of Research and Development, Athens Georgia who last modified this content on: February 10, 2001

Last updated on Monday, June 21st, 2004
URL: http://www.epa.gov/athens/learn2model/part-two/onsite/gradient.htm

Time, s	h, m	$h - H_o$, m	$(h - H_o)/0.42$
0	2.23	0.935	0.99
3	2.15	0.855	0.91
6	2.1	0.805	0.86
9	2.02	0.725	0.77
12	1.94	0.645	0.69
15	1.89	0.595	0.63
18	1.82	0.525	0.56
21	1.76	0.465	0.49
24	1.7	0.405	0.43
27	1.67	0.375	0.40
30	1.65	0.355	0.38

0	0.00
3	3.19
6	6.38
9	9.57
12	12.77
15	15.96
18	19.15
21	22.34
24	25.53
27	28.72
30	31.91

K = Hydraulic Conductivity, m/d or ft/d
r = radius of well casing, cm
R = radius of well screen, cm
L = length of well screen, cm
T_0 = time required for water level to reach 37% of the initial change, s
H_0 = static water level measured from top of casing
H = water level after slug is removed

r =	5.08	cm
R =	2.54	cm
L =	304.8	cm
T_0 =	16	s
H_0 =	1.295	m
H =	1.045	m

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

$$K = \frac{3096.77}{9753.6} = 0.3175 \text{ cm/s}$$

(0.3175 cm/s)(1m/ 100cm)(86400 s/d) = ft/d

0.3175	1	100	86400	274.32 ft/d

U.S. Environmental Protection Agency

EPA On-line Tools for Site Assessment Calculation

Seepage Velocity Calculation and Advective Travel Time

Notice

The old seepage velocity and travel time calculator determined the *advective* travel time. This calculation accounted for transport due to advection and sorption only. Because of widespread biodegradation of petroleum hydrocarbons and dispersion in aquifers, the advective travel time can come long after the first arrival time of a contaminant at a receptor. To avoid this situation the one-dimensional transport calculators have been revised to calculate the first arrival times.

Try instead:

- Transport from a Continuing or Pulse Source
- Transport from a Fuel Source

Continue below for the seepage velocity calculation.

Seepage Velocity

Seepage Velocity Calculation
See bottom of page for equations solved.

Example Data Set | Calculate | Clear

Save Data | Recall Data | Go Back

Input Parameters

Site Name	Bldg 1279
Date	1/3/2005 Current Date
Distance Unit	ft
Time Unit	days
Chemical	benzene
Porosity	.27
Fraction Organic	

Carbon	.0001	
Hydraulic Conductivity (K)	274.75	ft/day
Upgradient Location (x_1,y_1)	100 | 0	
Downgradient Location (x_2,y_2)	50 | 0	
Head unit	ft	
Upgradient Water Level (h_1)	4.250	
Downgradient Water Level (h_2)	3.250	

Defaults

K_{oc}	83

Intermediate Results

Hydraulic Conductivity (K)	274.8	ft/day
Bulk Density (ρ_b)	1.93	
k_d	0.00830	
Retardation factor (R)	1.06	
Gradient (i)	-0.020	

Main Result

Seepage Velocity (q_s = v)	20.35 ft/day	ft/day
Retarded Seepage Velocity (q_s/R)	19.21 ft/day	

seepage velocity $q_s = v = -K\,i / \theta$

q_s = v = seepage velocity [L/T]
K = hydraulic conductivity [L/T]
i = hydraulic gradient [L/L]
θ = porosity [L/L]

retardation factor $R = 1 + \rho_b k_d / \theta$

R = retardation factor

ρ_b = bulk density = $\rho_s(1-\theta)$
ρ_s = solids density
θ = porosity
k_d = (soil) distribution coefficient = f_{oc} K_{oc}
f_{oc} = fraction organic carbon
K_{oc} = organic carbon/water partition coefficient

Top ^
Home | Glossary | Notation | Links | References | Calculators

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Page author: Jim Weaver, of U.S. EPA, Office of Research and Development, Athens Georgia who last modified this content on: August 17, 2004

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View the graphical version of this page at: http://www.epa.gov/athens/learn2model/part -two/onsite/seepage.htm

APPENDIX E
Soil and Water Disposal Manifests

South Carolina Department of Health and Environmental Control

Bureau of Solid & Hazardous Waste Mgt.
2600 Bull Street, Columbia, SC 29201
Phone: (803) 896-4000
Emergency & Holidays: (803) 253-6488

PLEASE PRINT or TYPE (Form designed for use on elite [12-pitch] typewriter)

Form Approved. OMB No. 2050-0039 Expires 9-30-99

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's U.S. EPA ID No. SC0417022250 Manifest Document No. 0002

2. Page 1 of

Information in the shaded areas is not required by Federal law, but is by State law.

3. Generator's Name and Mailing Address
CHARLESTON NAVAL COMPLEX 1824 BAINBRIDGE ROAD
N CHARLESTON, SC 29405

4. Generator's Phone (843) 329-1851

A. State Manifest Document Number 0002

B. State Generator's ID

5. Transporter 1 Company Name
TRANSGLOBAL

6. U.S. EPA ID Number SC0000075615

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. U.S. EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
SOUTHEASTERN CHEMICAL & SOLVENT CO
755 INDUSTRIAL ROAD,
SUMTER, SC 29150

10. U.S. EPA ID Number SCD038276826

G. State Facility's ID

H. Facility's Phone 803/773-4400

11. U.S. Dot Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol.	I. Waste Number
a. SOIL AND WATER NON HAZARDOUS NON REGULATED 74080	2	DM			NREG
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
A. 74080
B.
C.
D.

K. Handling Codes for Wastes Listed Above
12T03064 JRB
2/10

15. Special Handling Instructions and Additional Information
Send CD to Global
24 Hour Emergency: Globals Chemtel: 1-800-255-3924
Non Emergency: Global, 1-843-563-8916 and BRIAN CRAWFORD, (843) 386-1851

Public reporting burden for this collection of information is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M St., S.W., Washington, D.C. 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503.

GENERATOR

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name | Signature | Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Type Name | Signature | Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

a ____ lbs. c ____ lbs.
b ____ lbs. d ____ lbs.

20. Facility Owner or Operator; Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name | Signature | Month Day Year