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RAPID ASSESSMENT REPORT FOR SITE 30 BUILDING NH-46 ZONE C CNC CHARLESTON SC

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TETRA TECH INC

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Rapid Assessment Report for Site 30, Building NH 46

Zone C
Charleston Naval Complex

North Charleston, South Carolina

Southern Division
Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0093

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RAPID ASSESSMENT REPORT
FOR
SITE 30, BUILDING NH 46

ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
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North Charleston, South Carolina 29406

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CERTIFICATION PAGE

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EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Rapid Assessment (RA) for Site 30 (Building NH 46) a closed underground storage tank (UST) system. The UST system supplied fuel oil to the boilers at Building NH 46 at Charleston Naval Complex (CNC) Zone C, in North Charleston, South Carolina. The RA was performed under the direction of the South Carolina Department of Health and Environmental Control (SCDHEC).

TtNUS performed the following actions during the RA:

- Reviewed available Navy documents to identify potential sources and receptors for petroleum hydrocarbons in the vicinity, to evaluate public and private potable wells, to locate utilities, to locate nearby surface water bodies, and to determine surface hydrology and drainage.
- Reviewed the previously prepared Storage Tank Assessment Report for USTs NH46-1 through NH46-4 to determine soil boring locations and monitoring well placements.
- Conducted a site survey to identify utilities and to construct a site plan.
- Performed a direct push investigation to collect soil samples for field screening using an organic vapor analyzer and collect soil and groundwater samples for mobile laboratory screening analyses for benzene, toluene, ethylbenzene, total xylenes (BTEX), and diesel range organics.
- Installed three temporary piezometers, 12 shallow permanent monitoring wells ranging in depth from approximately 12.5 feet to 16.5 feet below land surface (bls), and two vertical delineation monitoring wells to approximately 35 feet bls.
- Collected groundwater samples from the permanent monitoring wells for laboratory analyses for BTEX, methyl tert-butyl ether (MTBE), and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260 and polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270.
- Performed groundwater natural attenuation sampling.
- Collected soil samples for laboratory analysis for BTEX and naphthalene using USEPA Method 8260, PAHs using USEPA Method 8270, total organic carbon (TOC) using USEPA Method 415.1, total recoverable petroleum hydrocarbons (TRPH) using USEPA Method 9071, and grain size analysis using sieve and hydrometer methods.
- Surveyed monitoring well top of casing elevations and collected depth to groundwater measurements to evaluate the groundwater flow direction.

Conclusion

Benzene, ethylbenzene, and naphthalene were the only Chemicals of Concern (CoC) detected in the onsite soils at concentrations that exceed the SCDHEC Risk-Based Screening Levels (RBSLs) for sandy-rich soils. Although benzene was not detected in any of the soil samples collected during the RA investigation, in two samples the laboratory detection limits were elevated above the 5 micrograms per kilogram (ug/kg) RBSL for benzene. Samples SLB210708 and SLB330506 had elevated detection limits of <300 ug/kg and <340 ug/kg respectively. Therefore, benzene is considered as a CoC with a maximum concentration of 340 ug/kg. Ethylbenzene concentrations in samples 30SLB210708 (3,900 ug/kg) and 30SLB330506 (3,000 ug/kg) exceeded the ethylbenzene RBSL of 1,260 ug/kg. Naphthalene was detected in sample 30SLB170708 (boring CNC30-B17) at 46,000 ug/kg, sample 30SLB210708 at 39,600 ug/kg, and sample 30SLB330506 at 50,000 ug/kg. The naphthalene concentrations in these samples exceeded the naphthalene RBSL of 210 ug/kg.

An onsite construction worker (utility) was identified as a potential future receptor. The RBSLs for benzene, ethylbenzene, and naphthalene were calculated for dermal, incidental ingestion, and inhalation exposures for a construction worker in a utility trench. Based on the RBSLs, Site-Specific Target Levels (SSTLs) were calculated for the subsurface CoCs (benzene, ethylbenzene, and naphthalene) leaching to groundwater. The soil leaching SSTL calculated for benzene was 0.89 mg/kg, which is above the maximum benzene concentration of 0.34 mg/kg, indicating benzene will not leach into the groundwater at concentrations above the RBSL for a construction worker. The soil leaching SSTL for ethylbenzene was calculated at 75 mg/kg, exceeding the maximum ethylbenzene concentration of 3.9 milligrams per kilogram (mg/kg); therefore, ethylbenzene will not leach into the groundwater at concentrations above the RBSL for a construction worker. The naphthalene soil leaching SSTL was 167 mg/kg and is greater than the maximum naphthalene concentration of 50 mg/kg, indicating naphthalene will not leach into the groundwater at concentrations above the RBSL for a construction worker.

Naphthalene was the only CoC detected in the groundwater at concentrations above RBSLs. Groundwater concentrations of naphthalene above the RBSL of 10 micrograms per liter (ug/L) were detected in monitoring wells CNC30-MW04 at 64 ug/L, CNC30-MW01 at 410 ug/L, and CNC30-MW10 at 470 ug/L. No free product was detected at Site 30 during the RA investigation

No groundwater drinking water wells or surface water bodies are located in the immediate vicinity to Site 30. Fate and transport modeling predicts the groundwater naphthalene concentration at the source (tip of downgradient plume) would migrate a distance downgradient of 45 feet after

10 years, and 80 feet after 20 years. At the outer edge of the plume migration after 10 or 20 years, the naphthalene groundwater concentrations would attenuate to the groundwater ingestion level of 0.010 mg/kg.

Recommendation

Intrinsic Corrective Action is proposed for Site 30. The Intrinsic Corrective Action proposes that a short-term groundwater monitoring be developed to monitor petroleum constituents over time.

1.0 INTRODUCTION

Site 30 is a closed underground storage tank (UST) system which utilized four USTs that provided fuel oil to the boilers at Building NH 46 at the Charleston Naval Complex (CNC), Zone C in Charleston, South Carolina. This Rapid Assessment (RA) was performed by Tetra Tech NUS, Inc.'s (TtNUS's) Tallahassee, Florida, office, located at 1401 Oven Park Drive, Suite 102, Tallahassee, Florida 32312 (telephone number 850-385-9899) on behalf of the U.S. Navy Southern Division (SOUTHDIV) Naval Facilities Engineering Command (NAVFAC), 2155 Eagle Drive, North Charleston, South Carolina 29406 (telephone number 843-820-7307). Authorization to conduct the RA for the site was issued by NAVFAC under Contract Task Order (CTO) 0093. The RA was performed under the direction of the South Carolina Department of Health and Environmental Control (SCDHEC). Fieldwork necessary to complete the RA was performed May 15-18, June 5-30, July 1-27, August 19-22, and October 12,1999, by TtNUS.

1.1 SITE DESCRIPTION

The CNC is in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina, as shown on Figure 1. This installation consists of two major areas: an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the peninsula bounded on the west by the Ashley River and on the east by the Cooper River. The site is located within the developed portion of the base as shown on Figure 2.

The area surrounding CNC is "mature urban," having long been developed with commercial, industrial, and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. A site vicinity map, which exhibits adjacent properties and structures, vicinity roads, current utilities, and vicinity surface drainage, is included as Figure 2.

Building NH 46 was constructed in 1941 and served as part of the Naval Hospital complex. The building's boilers utilized four steel USTs, UST NH46-1, UST NH46-2, UST NH46-3, and UST NH46-4, located on the east side of the building to provide fuel oil to the boilers (Figure 3). Each UST was installed in 1941; however, the date the UST system was last in operation is unknown [Supervisor of Ship Building, Conversion and Repair, United States Navy, Portsmouth, Virginia, Environmental Detachment Charleston (SPORTENDETCHASN), 1996].

1.2 SITE HISTORY

In 1901, the U.S. Navy acquired 2,250 acres near Charleston to build a shipyard and the first naval officer was assigned duty in early 1902. Subsequently, buildings and a dry dock were constructed in the Naval Yard. The dry dock was completed in 1909 along with several other brick buildings and the main power plant, which is still in operation today. The first ship was placed in dry dock and work began on fleet vessels in 1910. World War I brought about an expansion of the yards, facilities, land area, and work force. The yard built two gunboats, several submarine chasers, and tugs in addition to performing repairs and other services to the fleet. In 1933, building activity had increased principally in construction of several Coast Guard tugs, a Coast Guard cutter, and a Navy gunboat, creating the need for more facilities and a much larger work force. In 1943 civilian work force peaked with almost 26,000 employees divided among three daily shifts. In 1956, construction began on piers, barracks, and buildings for mine warfare ships and personnel. Later in the decade, the facility became a major home port for combat ships and submarines of the U.S. Atlantic Fleet [Ensafe/Allan & Hoshall, Inc. (E/A&H), 1997].

In 1993, major cuts in defense spending, as a result in part to the end of the Cold War, caused CNC to be added to the list of bases scheduled for closure under the Defense Base Realignment and Closure Act (BRAC). BRAC regulates the closure and transition of property back to the community (E/A&H, 1997). With the scheduled closure of the base, operations were scaled back and environmental cleanup proceeded to make the property available for redevelopment after closure. As part of the environmental cleanup process, UST NH46-1, UST NH46-2, UST NH46-3, and UST NH46-4 at Building NH 46 were removed and the tank closure was completed on September 18, 1996.

From August 15 through September 18, 1996, UST NH46-1, UST NH46-2, UST NH46-3, and UST NH46-4 were removed, cleaned, and recycled as scrap metal. At the time the USTs were removed, corrosion and pitting were observed throughout all four tanks, with the more severe occurring on the bottom sides of the tanks. Two holes, 1/8-inch and 3/4-inch, were identified in UST NH46-1, one hole 1/4-inch was found in UST NH46-2, and one elongated hole 1 inch by 3 inches was observed in UST NH46-4. All holes were located in the lower bottom portion of the side of the tanks. During removal of the tanks, soil staining from overfills at the fill pipe was observed. Mild petroleum odors were detected in the tank excavation. All soils removed from the excavation were returned to the tank pit (SPORTENDETCHASN, 1996).

The UST system piping was constructed of steel and ran a distance of approximately 6 feet below ground from the UST tank pit to the building. The system piping was reported in good condition with the exception of the ventilation lines for each tank which were corroded. All system piping was removed from the ground during the UST closure (SPORTENDETCHASN, 1996).

Soil Grab samples were obtained from the UST and piping excavations. Analytical results of the samples indicate reportable concentrations of polynuclear aromatic hydrocarbon (PAH) compounds. *The Underground Storage Tank Assessment Report for NH46* is included in Appendix A.

1.3 RECEPTOR SURVEY RESULTS

A survey of the site vicinity was conducted by TtNUS personnel to identify potential receptors for petroleum hydrocarbon contamination. The site plan (Figure 2) depicts the public utilities located within 250 feet of the former UST NH46-1 through NH46-4 study area. Specific information concerning the depth of utilities below land surface is currently unavailable. However, according to facility personnel, utility lines are typically located approximately 2 to 6 feet below land surface (bls) (SPORTENVDETCHASN, 1999). The following utility receptors were located:

- Sanitary sewer, water utility: A sanitary sewer line is located approximately 10 feet east of the former NH46 UST tank bed and is orientated in a north to south direction. This sewer line is the nearest hydraulically downgradient (with respect to groundwater flow) sewer line to the former NH46 UST tank bed. Sanitary sewer lines are also located west of Building NH 46. A water line is located approximately 30 feet east of the former NH46 UST tank bed with the line extending in a north to south direction. Water lines are also located north and south of Building NH 46.

- Electrical utility, gas utility: An electric line enters Building NH 46 on the east side approximately 50 feet from the former NH46 UST tank bed. This electrical line extends from Building NH 46 toward the east. A gas line enters Building 72 from the north approximately 85 feet northwest of the former NH46 UST tank bed.

- Storm drain utility: The nearest hydraulically downgradient storm drain system is located approximately 25 feet east of the former NH 46 UST tank bed. A storm drain is also located approximately 100 feet to the north. A sanitary storm sewer runs beneath Building NH 46 on the eastern side of the building. Storm sewer lines are also located on the westside of Building NH 46.

According to the *Final RCRA Facility Investigation Report for Zone H* (E/A&H, 1996a) a survey of groundwater users within a 7-mile radius of CNC was conducted by the South Carolina Water Resources Commission to ascertain the extent of any shallow groundwater usage. Results of the water use investigation revealed that no drinking water wells, which utilize the shallow aquifer, are located within a 4-mile radius of CNC. Irrigation wells were not identified within 1,000 feet of the site. Numerous monitoring wells are located within 1,000 feet of the site. The nearest surface water body to the former NH46 UST

tank bed is Noisette Creek located approximately 1,500 feet to the north. No basements are located on the CNC property (E/A&H, 1996a).

There are no city, county, or state zoning ordinances as the property (CNC) is currently owned by the federal government. Information concerning zoning ordinances was obtained from the SOUTHDIV Remedial Project Manager located at 2155 Eagle Drive, North Charleston, South Carolina 29406 (telephone number 843-820-7307).

1.4 REGIONAL GEOLOGY AND HYDROGEOLOGY

CNC is located in Charleston County, South Carolina, in the Lower South Carolina Coastal Plain Physiographic Province on the Cooper River side of the Charleston Peninsula. The peninsula is formed by the confluence of the Cooper and Ashley Rivers. Topography in the area is typical of the South Carolina lower coastal plain and is characterized by having low-relief plains broken by the meandering streams and rivers, flowing toward the coast past occasional marine terrace escarpments (E/A&H, 1997).

The geology of the Charleston area is typical of the southern Atlantic Coastal Plain. Cretaceous-age and younger sediments thicken seaward and are underlain by older igneous and metamorphic basement rock. Surface exposures consist of Recent or Pleistocene sands, silts, and clays of high organic content referred to as the Wando Formation (E/A&H, 1997). Underlying the Wando Formation, increasing with age, are the Oligocene-age Cooper Group and the Eocene-age Santee Limestone. The Cooper Group is comprised of the Parkers Ferry, Ashley, and Harleyville Formations. The formation of particular importance in the Cooper Group is the Ashley Formation, which was formerly referred to as the Cooper Marl in most regional geologic literature. In more recent geologic nomenclature, the name "Cooper" has been given to a group of formations including the Ashley Formation, a pale green to olive-brown, sandy phosphoric limestone or marl, which is locally muddy and/or sandy. The Ashley Formation in the vicinity of Charleston is encountered at a depth of approximately 30 to 70 feet bls. The top of the Ashley Formation has been reported to be associated with an erosional basin and the entire Cooper Unit, including the Ashley Formation, is indicated to be approximately 300 feet thick (E/A&H, 1997).

Groundwater occurs under water table or poorly confined conditions within the Recent or Pleistocene deposits overlying the Ashley Formation of the Cooper Group. Transmissivity in the Pleistocene aquifer is generally less than 1,000 feet per day and well yields are variable, ranging from 0 to 200 gallons per minute (gpm). This groundwater contains high concentrations of iron and is commonly acidic at shallow depths (E/A&H, 1997).

The Cooper Group is hydrogeologically significant mainly because of its low permeability. In most locales, its sandy, finely granular limestone produces little or no water, but instead acts as confining material causing artesian conditions in the underlying Santee Limestone. Yields from wells in the Santee are usually less than 300 gpm (E/A&H, 1997).

2.0 ASSESSMENT INFORMATION

2.1 SITE-SPECIFIC GEOLOGY AND HYDROGEOLOGY

2.1.1 Site Geology

Thirty-seven direct push soil borings were advanced at Site 30 under the supervision of a TtNUS geologist from May 13 through July 10, 1999 (Figure 3). Thirty-six borings were advanced to depths ranging from 10 feet bls to 16 feet bls and one boring was completed to 28 feet bls to provide soil samples to characterize the subsurface lithology. From June 12 through June 19, 1999, 12 shallow monitoring wells were installed to depths ranging from 12.5 to 16.5 feet bls. During installation soil grab samples were collected to describe the subsurface lithology. From June 19 through July 8, 1999, two vertical delineation monitoring wells were installed. During the drilling process, lithologic samples were collected using split-spoon samplers to characterize the subsurface lithology to a depth of 37 feet bls.

Based on lithologic descriptions from the soil borings, the subsurface soil is predominantly composeds of sand, silty sand, and sandy silt from near surface to 37 feet bls. Occasionally, thin units of of clayey sand, sandy clay, and clay were encountered (Figures 4 and 5). Boring logs are presented in Appendix B.

2.1.2 Site Hydrogeology

Twelve shallow water table monitoring wells and two deep vertical delineation monitoring wells were installed as part of this RA investigation (see Figure 3). The shallow monitoring wells were completed to depths ranging from 12.5 to 16.5 feet bls. Each shallow monitoring well was completed using 10 feet of 2-inch- diameter, 0.01-inch machine-slotted Schedule 40 polyvinyl chloride (PVC) screen that bracketed the water table. Monitoring wells CNC30-MW12D and CNC30-MW13D were completed as a Type III monitoring well with 6-inch-diameter PVC surface casing grouted to a depth of 25 feet bls. After the grout for the surface casing cured for 24 hours, the boreholes were advanced to a depth of 37 feet and a 2-inch-diameter PVC monitoring well was installed with a 5-foot, 0.01-inch machine-slotted PVC screen. The bottom of the well screens were set at 35 feet bls. Well construction logs for the RA monitoring wells are presented in Appendix B. At the completion of the well installations, a South Carolina registered professional surveyor surveyed each monitoring well location and the top of casing elevation.

During the soil boring program, three temporary, small diameter, PVC piezometers were installed at the site. The piezometers were constructed of 1-inch-diameter Schedule 40 PVC threaded casing and well

screen. The screen of each piezometer was installed to bracket the water table. The piezometers were used to provide preliminary depth to groundwater measurements to evaluate the groundwater flow direction across the site.

Groundwater in shallow monitoring wells at Site 30 was encountered at depths from approximately 6 to 11 feet bls during the RA investigation. The recorded water-level data collected during the RA are presented in Table 1. Groundwater elevation measurements were recorded from the site monitoring wells on September 11, 1999. Figure 6 presents the groundwater potentiometric surface from groundwater level measurements collected on September 11, 1999. The potentiometric surface maps depict a groundwater flow direction toward the northeast.

As part of the *Final RCRA Facility Investigation Report for Zone B* (E/A&H, 1996b), a tidal influence investigation was conducted to determine what effects tidal ranges in Noisette Creek and the Cooper River exhibit on groundwater flow within Zone B. The objective of the investigation was to measure water levels in the shallow aquifer during low, mid, and high tides in Zones A and B. Select wells in Zones C and E near the perimeter of Zone B were also measured to obtain additional data. Since Zone B is bordered by Noisette Creek to the north and is situated between Zone C and the Cooper River, results from the Zone B tidal influence investigation were used to evaluate effects of tidal influence on Site 30. Site 30 is located in Zone C of the RCRA Facility Investigation.

Measurements of tidal fluctuations identified that surface water elevations for Noisette Creek and the Cooper River varied greatly with tidal events; however, the tidal fluctuations produced less than 0.1 foot variations in all of the Zone B shallow wells. The results identified no significant change in groundwater flow direction in Zone B resulting from tidal fluctuations in Zone B (E/A&H, 1996b). Since Site 30 is located farther inland from the Cooper River than the Zone B study area and farther inland to the Noisette Creek tributary, the impact of tidal fluctuation on the shallow groundwater flow direction at Site 30 is considered negligible.

2.2 ASSESSMENT RESULTS

Thirty seven soil borings were completed as part of the screening portion of the soil investigation at Site 30. Eight borings were completed to collect soil samples for analysis at a fixed base laboratory to confirm the Chemicals of Concern (CoC). The soil borings for screening evaluation were completed using a Direct Push Technology (DPT) rig. Samples were collected to evaluate subsurface soil vapors, soil contaminant concentration (via a mobile laboratory), and groundwater contaminant concentrations (via a mobile laboratory). The soil samples for organic vapor screening were collected from a maximum depth

of 14 feet bls. The soil and groundwater samples collected for mobile laboratory screening were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), naphthalene, and diesel range organics.

Soil samples for CoC evaluation were collected on June 28, August 19, and October 12, 1999, and analyzed for BTEX, ethylene dibromide (EDB) and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260; and PAHs using USEPA Method 8270. One sample was collected from boring CNC30-B14 for total organic carbon (TOC) analysis using USEPA Method 415.1, total recoverable petroleum hydrocarbons (TRPH) analysis using USEPA Method 9071, and grain size using sieve and hydrometer analysis. The sample collection was conducted in accordance with the SCDHEC guidance document *Standard Limited Assessment* (June 1997). Lithologic logs for each soil boring are presented in Appendix B. The soil boring locations are shown on Figure 3 and the assessment results are presented in Section 2.3.1.

Groundwater samples for laboratory analysis were collected from monitoring wells at the site on July 10-12, July 27, and August 22, 1999. Groundwater sampling was conducted using a peristaltic pump and low flow, quiescent techniques. The monitoring wells were sampled in accordance with SCDHEC's guidance document *South Carolina Risk-Based Corrective Action for Petroleum Releases* (January 1998). Each well was purged of three well volumes or until water quality parameters of pH, temperature, and conductivity stabilized. The field data sheets are included in Appendix C. A summary of the field parameter measurements is presented in Table 2. Groundwater samples were analyzed for BTEX, methyl tert-butyl ether (MTBE), EDB, and naphthalene using USEPA Method 8260 and PAHs using USEPA Method 8270. Three of the groundwater samples were also analyzed for the following natural attenuation parameters: dissolved oxygen, alkalinity, carbon dioxide, sulfide, ferrous iron, nitrite, manganese, nitrogen/nitrate, sulfate and methane. Groundwater natural attenuation data are summarized on Table 3.

2.3 FIELD SCREENING ASSESSMENT

2.3.1 Soil Vapor Assessment

Thirty-seven soil borings were completed to evaluate for soil vapors as part of the soil screening assessment at Site 30. Organic vapor analyzer (OVA) headspace measurements were recorded at 1-foot intervals from near ground surface to the top of the water table at the former UST tank field and the area immediately adjacent to the former UST system (source area). Away from the source area, soil samples were collected at depth from select intervals to evaluate the vapor concentrations in the subsurface. Table 4 summarizes the soil vapor screening results. Figure 3 presents the soil boring locations.

Soil vapor concentrations ranged from not detected to 400 parts per million (ppm). Samples collected from 26 soil borings contained vapor concentrations ranging from 2 to 10 ppm and five soil borings exhibited vapor readings from 16 to 50 ppm. Soil vapor concentrations ranging from 100 to 160 ppm were detected at four boring locations. The highest soil vapor concentrations were detected at boring CNC30-B02 at greater than 200 ppm, and CNC30-B20 at 400 ppm. The higher soil vapor concentrations, greater than 100 ppm, were encountered in soils from 7 to 14 feet bls with the highest soil vapor concentrations reported in samples overlying the water table.

The soil vapor assessment was used as a screening method to assist in identifying the locations for the collection of soil samples and groundwater monitoring wells. Soil sample and monitoring well locations were determined, in part, based on these data.

2.3.2 Soil Mobile Laboratory Results

Soil samples were collected from each boring for analysis by a mobile laboratory for BTEX, naphthalene, and diesel range organics using USEPA Methods 8021B and 8015M. The soil samples were selected based on the soil vapor screening results with the additional criteria that the samples originate in the vadose zone above the water table. Table 5 presents a summary of the analytical data from the mobile laboratory.

As indicated in Table 5, benzene and toluene were reported below the laboratory reporting limit in all samples. Ethylbenzene and total xylenes were detected in three samples. The ethylbenzene concentrations ranged from 250 micrograms per kilogram (ug/kg) to 413 ug/kg, and the total xylene concentrations ranged from 271.6 ug/kg to 1059 ug/kg. Naphthalene was reported in six samples at concentrations of 12 ug/kg, 450 ug/kg, 486 ug/kg, 693 ug/kg, 850 ug/kg, and 981 ug/kg. Diesel range organics were detected in 13 of the 37 soil samples. Seven of the samples reported diesel range organics ranging in concentrations from 11 milligrams per kilogram (mg/kg) to 37 mg/kg and one soil sample detected a diesel range organic concentration of 470 mg/kg. Diesel range organics were reported at concentrations ranging from 7,710 mg/kg to 70,100 mg/kg in five samples.

The mobile laboratory soil analysis was used as a screening method to assist in identifying the locations for the collection of soil samples for fixed base laboratory analysis and locations for groundwater monitoring wells. Soil sample and monitoring well locations were determined, in part, based on these data.

2.3.3 Groundwater Mobile Laboratory Results

Groundwater samples were collected from 37 borings and 2 wells and were analyzed by a mobile laboratory for BTEX, naphthalene, and diesel range organics using USEPA Methods 8021B and 8015M. Table 6 presents a summary of the analytical data from the mobile laboratory.

As indicated in Table 6, Benzene was detected in samples from eight boring at concentrations ranging from 1.1 microgram per liter (ug/L) to 53 ug/L. Samples from seven borings contained toluene at concentrations ranging from 1.4 ug/L to 21 ug/L. Ethylbenzene concentrations ranged from 4.3 ug/L to 227 ug/L in samples collected from 17 borings. Total xylenes were detected in 15 samples with concentrations ranging from 1.7 ug/L to 51.3 ug/L in 12 samples. Three samples contained total xylenes at concentrations of 404.5 ug/L, 540 ug/L and 798 ug/L. Naphthalene concentrations were detected in samples from 22 borings. The highest naphthalene concentration was detected in one sample at 15,000 ug/L. Eleven samples contained naphthalene at concentrations ranging from 1,027 ug/L to 8,500 ug/L. Six samples detected naphthalene at concentrations ranging from 102 ug/L to 581 ug/L, and 3 samples reported naphthalene at concentrations between 34 ug/L and 58 ug/L. Diesel range organics were detected in 23 samples. Samples from 20 borings detected diesel range organics at concentrations ranging from 0.1 milligrams per liter (mg/L) to 240 mg/L. Diesel range organics were reported in samples from two borings at concentrations greater than 250 mg/L. The highest diesel range organic concentration was detected in a sample at 433 mg/L.

The mobile laboratory groundwater analysis was used as a screening method to assist in identifying the locations for permanent groundwater monitoring wells.

2.4 CHEMICALS OF CONCERN IN SOIL AND GROUNDWATER

2.4.1 Chemicals of Concern in Soil

Eight subsurface soil samples (plus one duplicate sample) were collected from the Site 30 area for determination of CoCs. The soil boring locations are shown on Figure 3, and Table 7 summarizes the CoCs detected in the soil samples. COCs detected in the soil include ethylbenzene, total xylenes, and naphthalene. Toluene was detected in sample 30SLB200607 (boring CNC30-20) at 10 ug/kg. Ethylbenzene was detected in sample 30SLB170708 (boring CNC30-B17) at 200 ug/kg, sample 30SLB210708 (boring CNC30-B21) at 3,900 ug/kg, and sample 30SLB330506 (boring CNC-B33) at 3,000 ug/kg. and total xylenes (2,800 ug/kg). Total xylenes were detected in samples 30SLB170708 and

30SLB210708 at 150 ug/kg and 5,400 ug/kg, respectively. Naphthalene was detected in samples 30SLB010708 at 13 ug/kg, sample 30SLB170708 at 46,000 ug/kg, sample 30SLB200607 at 17 ug/kg, sample 30SLB210708 at 39,600 ug/kg, and sample 30SLB330506 at 50,000 ug/kg.

The toluene concentration in sample 30SLB200607 (10 ug/kg) is less than the Risk Based Screening Level (RBSL) of 1,622 ug/kg for toluene in sandy soils. The total xylene concentrations detected in samples 30SLB170708 (150 ug/kg) and 30SLB210708 (5,400 ug/kg) are less that the RBSL of 42,471 ug/kg for total xylenes The ethylbenzene concentrations in samples 30SLB210708 (3,900 ug/kg) and 30SLB330506 (3,000 ug/kg) exceeded the RBSL of 1,260 ug/kg for ethylbenzene in sandy soils. The naphthalene concentrations in samples 30SLB170708 (46,000 ug/kg), 30SLB210708 (39,600 ug/kg) and sample 30SLB330506 (50,000 ug/kg) also exceeded the RBSL concentration of 210 ug/kg established for naphthalene in sandy soils. Benzene was not detected in any sample; however, the detection limits in two samples; SLB210708 at less than 300 ug/kg and SLB330506 at less than 340 ug/kg, were elevated above the RBSL for benzene of 5 ug/kg. Therefore, benzene was considered as a CoC with a maximum concentration of 340 ug/kg.

The RBSL for sandy soil was used based on boring log descriptions and grain size analysis completed on sample 30SLB050708 indicating a sandy soil matrix. Soil analytical data sheets and grain size analysis reports are provided in Appendix D. The areal distribution of benzene, ethylbenzene, total xylenes, and naphthalenes from the June, August, and October 1999 soil sampling are presented on Figures 7 through 10, respectively.

2.4.2 Chemicals of Concern in Groundwater

Table 8 presents the analytical results for CoCs detected in the groundwater samples from the July and August 1999 sampling events. The CoCs detected in the groundwater samples included ethylbenzene, total xylenes, and naphthalene. Ethylbenzene was detected at 38 ug/L, 18 ug/L and 140 ug/L in the groundwater samples collected from monitoring wells CNC30-MW01, CNC30-MW04 and CNC30-MW10, respectively. Total xylenes were detected in samples from CNC30-MW01 at 29 ug/L, CNC30-MW04 at 14 ug/L, and CNC30-MW10 at 22 ug/L. A naphthalene concentration estimated at 4 ug/L was detected in monitoring well CNC30-MW03. The ethylbenzene and total xylene concentrations are below the RBSLs established for ethylbenzene and total xylenes at 700 ug/L and 10,000 ug/L, respectively. Naphthalene was reported in three samples at concentrations of 470 ug/L (CNC30-MW01), 64 ug/L (CNC30-MW04), and 410 ug/L (CNC30-MW10). An estimated concentration of 4 ug/L was detected in CNC30-MW05. The naphthalene concentrations in monitoring wells CNC30-MW01, CNC30-MW04, and CNC30-MW10 exceeds the RBSL established for naphthalene at 10 ug/L. Groundwater analytical data sheets for the

July 10, July 11, July 12, and July 27, and August 22, 1999, field events are presented in Appendix D. The areal distribution of ethylbenzene, total xylenes, and naphthalene are illustrated on Figures 11, 12, and 13, respectively.

2.5 ANALYTICAL DATA

All analytical data from the September 1996 *Underground Storage Tank Assessment Report* are presented in Appendix A. Soil analytical data generated during this RA are summarized in Table 7. Groundwater analytical data generated during this RA are summarized in Table 8. The soil and groundwater laboratory analytical data for this RA are included in Appendix D.

2.6 AQUIFER CHARACTERISTICS AND EVALUATION

Groundwater levels were measured from the site monitoring wells on September 11, 1999. The groundwater flow direction across the site is toward the northeast as illustrated on Figure 6. The hydraulic gradient on September 11 between monitoring wells CNC30-MW01 and CNC30-MW05 was 0.018 feet per foot (ft/ft), and the hydraulic gradient between CNC30-MW10 and CNC30-MW09 was. 0.0030 ft/ft. Using these gradients, an average hydraulic gradeint of 0.0105 ft/ft was calculated for Site 30.

As part of the Final RCRA Facility Investigation Report for Zone C, rising and falling head slug tests were conducted on nine shallow monitoring wells throughout Zone C to determine the hydraulic conductivity of the surfical aquifer (E/A&H, 1997). Slug tests were conducted by instantaneously adding (falling head) or removing (rising head) a volume (slug) of water from the well and measuring the recovering water level with a data logger. A hydraulic conductivity value was then calculated for the rising head test and for the falling head test. The average hydraulic conductivity for each well was determined by calculating the geometric mean of the rising and falling head values. Because hydraulic conductivity data are lognormally distributed, the geometric mean was determined to be the most representative measure of central tendancy.

The well construction details and boring logs for each well tested during the RCRA investigation were reviewed to determine which wells were most representative of the conditions present at Site 30. To make this determination the screened interval and proximity to the site were evaluated. Based on this evaluation, monitoring well well NBCC047006 was selected as the most representative well. NBCC047006 is approximately 880 feet southeast of the site and is completed to a depth of approximately 13 feet with a 10-foot screened interval. The geometric mean of the rising and falling head conductivities

for NBCC047006 was 4.06 feet per day. The boring log showing the well completion and soil lithology for NBCC047006 is provided in Appendix E.

Potential movement of groundwater at the site may be described in terms of transportation by natural flow system in the saturated zone, assuming groundwater flow follows Darcy's Law. Using Darcy's Law the average linear velocity of groundwater may be expressed as:

$$V = \left(\frac{K}{n}\right) x\, i$$

where:

V = average velocity

K = hydraulic conductivity = 4.06 ft/day

n = volumetric porosity = 0.47
Sieve test results for samples 30SLB050708 indicated that the soil was 99% sand, and, therefore, the charts on pages C3 through C5 were not applicable for estimating and soil porosity. The soil porosity default value of 0.47 cm^3/cm^3 given for sandy soil on page B2 in SCDHEC (1998) was used as the effective porosity value.

i = most recent average hydraulic gradient measurement = 0.0105 ft/ft

therefore:

$$V = \left(\frac{4.06\ \text{ft/day}}{0.47}\right) x\ 0.0105\ \text{ft/ft}$$

$$V = 0.090\ \text{ft/day}$$

In summary, the seepage velocity of the surficial aquifer was calculated to be approximately 32 feet per year based on a hydraulic conductivity of 4.06 feet per day, a hydraulic gradient of 0.0105 feet per foot, and a porosity of 47% for sandy soil.

2.7 FATE AND TRANSPORT MODEL DESCRIPTION

The Domenico model was the fate and transport model used to model groundwater in the risk analysis. The Domenico dilution/attenuation model is presented in the SCDHEC guidance document, *South Carolina Risk-Based Corrective Action for Petroleum Releases* (SCDHEC 1998). This model is very conservative in that it assumes an infinite mass, areal source condition through which groundwater flows. The model incorporates biological decay effects through a first-order decay process; however, this mechanism was ignored because SCDHEC guidance specifies that the decay rate must be assumed to be zero if site-specific decay rates have not been determined.

The impacted groundwater source area was modeled as 50 feet (15.00 m) wide and 6.56 feet (2.0 m) deep; these values are conservative defaults suggested by the American Society for *Testing and Materials (ASTM) Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM, 1997). The maximum source concentrations are assumed to exist throughout the source area, further compounding the conservatism of the estimate.

Site-specific data were used for saturated hydraulic conductivity, hydraulic gradient, and fraction of organic carbon in soil (1.43E-06 m/sec, 0.0105 ft/ft, and 0.004825 g-C/g-soil, respectively). The soil bulk density (1.45 g/cm^3) and porosity (0.47 cm^3/cm^3) were the defaults given on page B2 in SCDHEC (1998). Sieve test results for samples 30SLB050708 indicated that the soil was 99% sand

The following estimates of dispersivity were used in the Domenico model as given in SCDHEC (1998):

Parameter	Estimate
Longitudinal Dispersivity, α_x	x/10, where x = distance between the point of exposure and the source or compliance point
Transverse Dispersivity, α_y	$\alpha_x/3$
Vertical Dispersivity, α_z	$\alpha_x/20$

Table 9 summarizes fate and transport parameters used in modeling.

2.8 PREDICTED MIGRATION AND ATTENUATION OF CHEMICALS OF CONCERN

The most recent groundwater-gauging event shows that groundwater flow is primarily to the northeast. The current extent of impact is limited to wells CNC30-MW01, CNC30-MW04, and CNC30-MW10. The concentrations of naphthalene were 470 ug/L in CNC-MW01, 64 ug/L in CNC30-MW04, and 410 ug/L in CNC30-MW10. These concentrations exceed the RBSL of 10 ug/L for naphthalene. Compounds of interest in all other monitoring wells were non-detect or below RBSLs.

The Domenico model was used to predict the distance at which the tip of the plume is attenuated to RBSLs in 10 and 20 years without using degradation due to biological decay. This was done by adjusting the time to 10 years (3.15×10^8 sec) and 20 years (6.31×10^8 sec) and solving for distance (x) by trial and error. The source was assumed to be naphthalene at CNC-MW10 (410 ug/L) for the entire 10- and 20-year periods. The distance was changed until the required distance that is necessary for the concentration to attenuate to the groundwater ingestion RBSLs was determined. Only the concentration of naphthalene at the source was greater than its groundwater ingestion RBSLs; therefore naphthalene

was the only chemical for which plume distances were calculated. The model estimates that after 10 years, the concentration of naphthalene will be 0.010 mg/L (RBSL) at a distance of 45 feet. Furthermore, after 20 years, the concentration of naphthalene is 0.010 mg/L (RBSL) at a distance of 80 feet (Figure 14). The Domenico 10-year and 20-year simulation spreadsheets are presented in Appendix F.

3.0 TIER 1 AND 2 EVALUATION

3.1 COMPARISON OF ANALYTICAL RESULTS WITH RBSLs

Soil samples were collected on June 28, August 19, and October 12, 1999. The samples were analyzed for BTEX and PAHs including naphthalene. Ethylbenzene and naphthalene were found at concentrations above RBSLs for sandy soil less than 5 feet above groundwater. Benzene was not detected in any sample; however, the detection limits in two samples, 30SLB210708 (boring CNC30-B21) at 300 ug/kg, and 30SLB330506 (boring CNC30-B33) at <340 ug/kg, were elevated above the RBSL for benzene of 5 ug/kg. Therefore, benzene was considered as a CoC with a maximum concentration of 340 ug/kg.

Groundwater sampling was conducted on July 10-12, July 27, and August 22, 1999. Free product was not detected in any of the wells. The wells were sampled and analyzed for BTEX, MTBE, and PAHs including naphthalene. Concentrations of target analytes were detected in wells CNC30-MW01, CNC30-MW03, CNC30-MW04, CNC30-MW05, and CNC30-MW10. The concentrations of naphthalene in CNC30-MW01 at 470 ug/L, CNC30-MW04 at 64 ug/L, and CNC30-MW10 at 410 ug/L exceeds the RBSL of 10 ug/L for naphthalene. Ethylbenzene and total xylenes were also detected in CNC30-MW01, CNC30-MW04, and CNC30-MW10, and an estimated concentration of total xylenes of 4 ug/L was detected in CNC30-MW05. The concentrations of ethylbenzene and total xylenes in the groundwater were below their respective RBSLs. Compounds of interest in all other monitoring wells were non-detect. A comparison of maximum soil and groundwater concentrations to RBSLs is summarized in Table 10.

3.2 SITE CONCEPTUAL EXPOSURE MODEL

This section focuses on the current and future land use issues concerning the site. The site is part of the former Naval Hospital Complex. Figure 1 shows that the site is located in and surrounded by the CNC. The area surrounding CNC is "mature urban," having long been developed with commercial, industrial, and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. This facility is included in the BRAC activities; therefore, the future use of the facility is unknown.

Drinking water at the site and surrounding properties is provided by the city of Charleston water treatment plants. The closest surface water body is Noisette Creek located approximately 1,500 feet north of the site. Potable wells and irrigation wells were not identified within 1,000 feet of the site (E/A&H 1996a).

Numerous monitoring wells are located within 1,000 feet of the site (E/A&H 1996a). Groundwater at the site flows to the northeast.

3.3 EXPOSURE PATHWAY ANALYSIS

This section presents the receptor characterizations of the potentially exposed populations in the vicinity of the site and identifies the potentially complete exposure pathways for those receptors. SCDHEC requires that only those exposure pathways with CoC concentrations exceeding Tier 1 RBSL concentrations are examined in a Tier 2 Risk-Based Corrective Action Report. Tables 11 and 12 present the exposure pathway assessments for current and future use scenarios, respectively.

3.3.1 On-Site Commercial Worker

An on-site commercial worker is defined as an employee who works in a commercial capacity at the site. Commercial use of the site in the future is likely; therefore, an on-site commercial worker was considered as a potential receptor. Incidental ingestion and dermal contact with impacted soil are expected to be negligible for commercial workers because they are located inside a building and surficial soil was not impacted above RBSLs. Drinking water at this site is provided by the city; therefore, ingestion of groundwater is not a complete exposure pathway. The building foundation is assumed to be sufficient to prevent volatilization from both soil and groundwater into a commercial building, and there is no history of vapors in the commercial building. It is unlikely that any additional exposure pathways will exist for future on-site workers; therefore, no complete pathways exist for either current or future commercial workers.

3.3.1.1 Daycare

A special case commercial site exists off-site. The property located adjacent to and downgradient from Site 30 was formerly used as a day care facility. Based on information provided by the Navy, the day care is no longer in operation and there are no plans to re-open it. However, due to the uncertainty of future land use, a day care worker or child attending day care was considered as a potential receptor. Incidental ingestion and dermal contact with impacted soil are expected to be negligible for day care workers and the children in day care because samples taken on the day care property confirm that surficial soil was not impacted above RBSLs. Drinking water at this site is provided by the city; therefore, ingestion of groundwater is not a complete exposure pathway. The building foundation is assumed to be sufficient to prevent volatilization from both soil and groundwater into a commercial building. A site inspection confirmed that the day care facility does not have a basement. It is unlikely that any additional exposure

pathways will exist; therefore, no complete pathways exist for current or future day care workers and the children in day care.

3.3.2.1 On-Site Visitor

An on-site visitor is defined as any person other than a worker who might come on site. On-site visitors would have the same exposure pathways as commercial workers, but their exposure duration would be much shorter. This receptor does not have to be quantified because a potential on-site visitor's chemical intake would not drive risk or cleanup levels at the site.

3.3.3 On-Site Construction Worker

An on-site construction worker is defined as a laborer who would be involved in intrusive activities on or around the site, particularly in the area of subsurface utilities. On-site construction workers could be exposed to constituents in soil by the following pathways: inhalation of volatiles from soil, dermal contact with soil, and incidental ingestion of soil. On-site construction workers could be exposed to constituents in groundwater by the following pathways: inhalation of volatiles from groundwater, dermal contact with groundwater, and incidental ingestion of groundwater. Utilities lie in the immediate vicinity of the impacted area, and this pathway was considered for soil and groundwater exposure to a utility worker.

3.3.4 On-Site Resident

An on-site resident is defined as any person making his or her home at the site. This site is expected to remain a commercial/industrial facility; therefore, the on-site resident receptor was not considered further.

3.3.5 Off-Site Resident

An off-site resident is defined as any person making his or her home near the site. This receptor's location is either an actual current residence near the site or is a vacant lot or property on which a residence could be built. The site is located in an area that will likely remain commercial/industrial; therefore, this potential receptor was not considered further.

3.3.6 Surface Water

Noisette Creek is located approximately 1,500 feet north of the site. No surface water body lies within 1,000 feet of the site; therefore, this pathway was not considered further.

3.4 IDENTIFICATION OF DATA REQUIREMENTS

No additional data are required to calculate site-specific target levels (SSTLs) for the site.

3.5 SITE-SPECIFIC TARGET LEVELS

The only identified future potential receptor is the construction (utility) worker. Site soil concentrations were compared with RBSLs for ingestion or dermal contact with surficial soil. (Surficial soil was not impacted at the site; however, for the construction worker pathway, exposure to subsurface soil is evaluated as surface soil because the worker is expected to have direct contact with the subsurface soil.)

Chemical of Concern	Maximum Concentration (mg/kg)	RBSL for Ingestion or Dermal Contact with Soil - Commercial (mg/kg)	Exceed RBSL
Benzene	0.34	200	No
Ethylbenzene	3.9	200,000	No
Naphthalene	50	41,000	No

Based on the above table, the construction worker exposed to on-site subsurface soil is not at risk.

Groundwater RBSLs provided by SCDHEC are for ingestion only; therefore, RBSLs were calculated for the additional pathways of dermal contact, incidental ingestion, and inhalation of volatiles.

Groundwater RBSLs for the construction worker were calculated for three pathways: dermal contact, incidental ingestion, and inhalation of volatiles. A target cancer risk of 1×10^{-6} and a target hazard quotient of 1 were used in the calculations. Standard defaults were used when available and applicable to a construction worker. When no standard parameters were available, conservative assumptions were used. Where possible, site-specific parameters were used for site conditions. For all pathways, the exposure frequency was assumed to be 60 days/year and the exposure duration was assumed to be 1 year. These assumptions were considered conservative based on the nature of utility work.

The dermal contact RBSLs were calculated using the procedures *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance* (USEPA Peer Consultation Workshop Draft, 1998). Based on expected limited contact with groundwater, the event frequency was assumed to be one event/day and the event duration was assumed to be 1 hour/event. The skin surface area available for contact was 4500 cm^2,

based on one-fourth the skin surface area given in the risk assessment guidance document for a swimming adult.

The incidental ingestion RBSLs were calculated using the equation given in *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Interim Final)* (USEPA 1989). An incidental ingestion rate of 0.01 L/day was assumed based on a fraction (12.5%) of the incidental ingestion rate for a wading adult (0.01 L/hr), considered for an 8-hour work day. The incidental ingestion rate for wading adults is given in *Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment* (USEPA Region 4 1995).

Utility lines in the area are typically 2 to 6 feet deep. The depth to groundwater at the site ranges from approximately 6 to 11 feet bgs. It was assumed that a construction worker might be exposed to chemicals volatilizing from standing groundwater. The inhalation RBSLs were calculated using Henry's Law:

$$RBSL_{WATER} = RBSL_{AIR}/H$$

Where H = Henry's Law constant [mg/L-air/mg/L-water]

The $RBSL_{AIR}$ for each chemical was calculated using the equation given in the American Society for Testing and Materials (ASTM) *Standard Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites, Designation E 1739-95e1* (1997). SCDHEC values were used for Henry's Law constants.

The minimum RBSL for the three pathways was chosen as the RBSLs for the construction worker. The following table shows the calculated RBSLs for each pathway along with the selected (minimum) RBSL:

	Dermal RBSL	Incidental Ingestion RBSL	Inhalation RBSL	Selected (Minimum) RBSL	Maximum Site Concentration
	mg/L	mg/L	mg/L	mg/L	mg/L
Benzene	0.85	68.52	0.15	0.15	<.005
Ethylbenzene	6.05	2838.89	14.50	6.05	0.140
Naphthalene	1.63	1135.56	2.63	1.63	0.470

Based on the above table, a construction worker exposed to groundwater at the site is not at risk. Appendix F provides the parameters and results of the RBSL calculations.

In addition, the SCDHEC Soil Leachability model was used to determine soil SSTLs for benzene, ethylbenzene, and naphthalene protective of groundwater exposure for a construction worker from leaching. Site-specific data were used for total petroleum hydrocarbons (TPH), percent of soil that is sand or clay, fraction of organic carbon in soil, distance from highest soil impact to water table, and hydraulic conductivity (5,720 mg/kg, 97% sand, 3% clay, 4825 mg-C/kg-soil, 76 cm, 1.43E-03 cm/sec, respectively). The soil bulk density (1.45 g/cm^3), annual average recharge (25 cm), wetting front suction (10 cm), porosity (0.47 cm^3/cm^3), and residual water content (0.04) were the defaults given on page B2 in SCDHEC (1998). Sieve test results for samples 30SLB050708 indicated that the soil was 99% sand, and therefore the charts on pages C3 through C5 were not applicable for estimating density and porosity.
The groundwater RBSLs used in the leachability calculations were those calculated above for construction worker exposure. The soil concentrations and calculated SSTLs were:

Chemical of Concern	Source Area Concentration (mg/kg)	SSTL (mg/kg)
Benzene	0.34	0.89
Ethylbenzene	3.9	75
Naphthalene	50	167

Appendix G provides the Leachability model calculations generating SSTLs.

Based on the above table, a construction worker exposed to groundwater contaminated by leaching from on-site subsurface contaminated soil is not at risk. The soil leaching SSTL calculated for benzene was 0.89 mg/kg, which is well above the maximum benzene concentration of 0.34 mg/kg, indicating benzene will not leach into the groundwater at concentrations above the RBSL for a construction worker. The soil leaching SSTL for ethylbenzene was calculated at 75 mg/kg exceeding the maximum ethylbenzene concentration of 3.9 mg/kg; therefore, ethylbenzene will not leach into the groundwater at concentrations above the RBSL for a construction worker. The soil leaching SSTL calculated for naphthalene was 167 mg/kg and is greater than the maximum naphthalene concentration of 50 mg/kg, indicating naphthalene will not leach into the groundwater at concentrations above the RBSL for a construction worker.

3.6 RECOMMENDATIONS

The areal extent of the petroleum impact to groundwater has been delineated at Site 30. Naphthalene was the only CoC detected in the groundwater at concentrations above RBSLs. Groundwater naphthalene concentrations above the naphthalene RBSL were detected at 64 ug/L, 410 ug/L, and 470

ug/L in shallow water table monitoring wells. No free product was detected at Site 30 during the RA investigation

No groundwater drinking water wells or surface water bodies are located in the immediate vicinity to Site 30. Fate and transport modeling predicts the groundwater naphthalene concentration at the source (tip of downgradient plume) would migrate a distance downgradient of 30 feet after 10 years, and 56 feet after 20 years. At the outer edge of the plume migration after 10 or 20 years, the naphthalene groundwater concentrations would attenuate to the groundwater ingestion level of 0.010 mg/kg.

The areal extent of soil impacted by petroleum constituents has been delineated at Site 30. Benzene, ethylbenzene, and naphthalene were the only CoCs detected in the soil above their RBSLs. However, the maximum concentration of benzene (0.34 mg/kg), ethylbenzene (3.9 mg/kg) and naphthalene (50 mg/kg) in soil is less than the SSTLs calculated by the Soil Leachability Model. Since the SSTLs for benzene, ethylbenzene and naphthalene are greater than the maximum concentrations detected in the soils during the RA investigation, the benzene, ethylbenzene, and naphthalene concentrations are protective of groundwater exposure for a utility/ construction worker.

It is proposed that Intrinsic Corrective Action be applied at Site 30. The Intrinsic Corrective Action should develop a short-term groundwater-monitoring program to monitor benzene, ethylbenzene, and naphthalene parameters in the groundwater over time.

4.0 REFERENCES

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TABLES

TABLE 1

GROUNDWATER ELEVATIONS
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL BASE COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well No.	Total Depth of Well (ft)	Top of Casing Elevation, ft (MSL)	Date Measured	Depth to Free Product (BTOC)	Product Thickness, ft	Depth to Water, ft (BTOC)	Groundwater Elevation, ft (MSL)
CNC30-MW01	12.5	17.85	8/22/99	ND	ND	9.39	8.46
			9/11/99	ND	ND	9.62	8.23
CNC30-MW02	12.5	17.82	7/11/99	ND	ND	10.12	7.70
			9/11/99	ND	ND	10.35	7.47
CNC30-MW03	15.0	17.97	8/22/99	ND	ND	10.40	7.57
			9/11/99	ND	ND	10.75	7.22
CNC30-MW04	14.0	15.10	7/12/99	ND	ND	9.38	5.72
			9/11/99	ND	ND	9.57	5.53
CNC30-MW05	13.0	12.46	8/22/99	ND	ND	6.80	5.66
			9/11/99	ND	ND	7.20	5.26
CNC30-MW06	13.0	11.75	7/12/99	ND	ND	6.58	5.17
			9/11/99	ND	ND	6.80	4.95
CNC30-MW07	13.0	11.41	8/22/99	ND	ND	6.22	5.19
			9/11/99	ND	ND	6.64	4.77
CNC30-MW08	15.0	15.37	7/10/99	ND	ND	6.87	8.50
			9/11/99	ND	ND	6.11	9.26
CNC30-MW09	13.0	11.20	7/12/99	ND	ND	9.60	1.60
			9/11/99	ND	ND	9.79	1.41
CNC30-MW10	16.5	13.30	6/20/99	ND	ND	7.53	5.77
			7/10/99	ND	ND	7.52	5.78
			9/11/99	ND	ND	7.79	5.51
CNC30-MW11	13.5	12.25	6/20/99	ND	ND	6.95	5.30
			7/10/99	ND	ND	6.85	5.40
			9/11/99	ND	ND	7.16	5.09
CNC30-MW12D	35.0	17.80	7/27/99	ND	ND	11.30	6.50
			9/11/99	ND	ND	11.83	5.97
CNC30-MW13D	35.0	14.87	7/12/99	ND	ND	9.22	5.65
			9/11/99	ND	ND	9.39	5.48
CNC30-MW14	15.0	12.70	7/11/99	ND	ND	7.03	5.67
			9/11/99	ND	ND	7.28	5.42

Notes:
MSL - Mean Sea Level
BTOC - Below Top of Casing
ft - feet
ND - Not Detected

TABLE 2

GROUNDWATER FIELD MEASUREMENTS
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Purge method	Volume (gallons)	Temp. (° C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)
CNC30-MW01	08/22/99	PP	2.5	28.8	6.05	0.100	13	0.75
CNC30-MW02	07/11/99	PP	1.5	24.5	5.97	0.106	0	1.28
CNC30-MW03	08/22/99	PP	2.5	26.1	4.96	0.066	1	1.90
CNC30-MW04	07/12/99	PP	2.8	24.1	6.48	0.297	0	2.35
CNC30-MW05	08/22/99	PP	3.1	26.2	5.39	0.170	3	0.36
CNC30-MW06	07/12/99	PP	3.4	23.5	6.19	0.172	0	2.60
CNC30-MW07	08/22/99	PP	3.5	25.8	6.71	0.290	41	0.47
CNC30-MW08	07/10/99	PP	2.9	28.0	6.59	0.369	16	1.52
CNC30-MW09	07/12/99	PP	2.9	22.8	6.89	0.165	0	3.37
CNC30-MW10	07/10/99	PP	4.5	24.9	4.81	0.337	1	1.52
CNC30-MW11	07/10/99	PP	1.0	25.3	6.59	0.434	55	1.6
CNC30-MW12D	07/27/99	PP	7.5	26.9	8.09	0.200	128	2.55
CNC30-MW13D	07/12/99	PP	12.6	23.5	6.94	0.162	0	2.84
CNC30-MW14	07/11/99	PP	3.9	26.9	5.65	0.116	0	0.94

Notes:

(° C) - Degrees Celsius
PP - Peristaltic pump, low flow technique
uMHOS/cm - Micro HOS per centimeter
NTU - Nephelometric turbidity units
mg/L - Milligrams per liter

TABLE 3

GROUNDWATER NATURAL ATTENUATION FIELD MEASUREMENTS
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Dissolved Oxygen (mg/L)	Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Sulfide (mg/L)	Hydrogen Sulfide (mg/L)	Ferrous Iron (mg/L)	Nitrite (mg/L)	Manganese (mg/L)	Nitrogen/ Nitrate (mg/L)*	Sulfate (mg/L) *	Methane (ug/L)*
CNC29-MW03	8/7/99	2.0	16	41	0.03	Not analyzed	0.01	0.025	Not analyzed	0.066	8.60	<5.2
CNC30-MW01	8/22/99	0.4	45	88	0.80	5.0	0.21	0.003	0.2	<0.05	1.2	9,200
CNC30-MW05	8/22/99	0.4	11	34	0.01	0.0	0.81	0.010	0.0	0.790	33.0	6.9

Notes:
mg/L - Milligrams per liter
ug/L - Micrograms per liter
* Fixed base laboratory analysis

TABLE 4

SUMMARY OF OVA SOIL SCREENING RESULTS
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Depth (feet)	Organic Vapor Headspace Concentration
CNC30-B01	1-2	2
	2-3	2
	3-4	2
	4-5	2
	5-6	2
	6-7	2
	7-8	40
CNC30-B02	1-2	2
	2-3	2
	3-4	2
	4-5	2
	5-6	2
	6-7	2
	7-8	2
	8-9	>200
CNC30-B03	1-2	2
	2-3	2
	3-4	2
	4-5	2
	5-6	2
	6-7	2
	7-8	150
CNC30-B04	1-2	5
	2-3	5
	3-4	5
	4-5	5
	5-6	5
	6-7	6
	7-8	6
	8-9	50
CNC30-B05	2-3	3
	3-4	3
	4-5	3
	5-6	3
	6-7	3
	7-8	3
	8-9	3
CNC30-B06	1-2	2
	2-3	2
	3-4	2
	4-5	2
	5-6	2
	6-7	2

TABLE 4 (Continued)

SUMMARY OF OVA SOIL SCREENING RESULTS
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Depth (feet)	Organic Vapor Headspace Concentration
CNC30-B06	7-8	2
	8-9	2
CNC30-B07	2-3	3
	3-4	3
	4-5	5
	5-6	3
	6-7	3
	7-8	3
	8-9	3
CNC30-B08	1-2	3
	2-3	3
	3-4	3
	4-5	3
	5-6	3
	6-7	3
	7-8	3
	8-9	3
CNC30-B09	2-3	4
	5-6	4
	6-7	4
	7-8	4
CNC30-B10	2-3	3
	3-4	3
	5-6	3
	6-7	3
	7-8	3
	9-10	3
CNC30-B11	2-3	3
	3-4	3
	5-6	3
	6-7	3
	7-8	3
CNC30-B12	2-3	4
	3-4	4
	4-5	4
	5-6	4
	6-7	4
	7-8	4
	8-9	4
	10-11	4
CNC30-B13	2-3	4
	3-4	4
	4-5	4
	5-6	4
	6-7	4

TABLE 4 (Continued)

SUMMARY OF OVA SOIL SCREENING RESULTS
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Depth (feet)	Organic Vapor Headspace Concentration
CNC30-B13	7-8	4
	8-9	5
CNC30-B14	2-3	5
	3-4	10
	4-5	10
	5-6	5
	6-7	5
	7-8	50
	8-9	100
CNC30-B15	2-3	4
	3-4	4
	5-6	4
	6-7	4
CNC30-B16	3-4	ND
	7-8	ND
	9-10	6
CNC30-B17	3-4	ND
	8-9	ND
	12-13	3
	13-14	110
CNC30-B18	3-4	ND
	7-8	ND
CNC30-B19	3-4	ND
	7-8	ND
CNC30-B20	3-4	ND
	7-8	ND
	10-11	400
CNC30-B21	3-4	ND
	7-8	17
CNC30-B22	2-3	ND
	7-8	ND
CNC30-B23	3-4	ND
	7-8	ND
	11-12	ND
CNC30-B24	3-4	ND
	7-8	ND
CNC30-B25	3-4	ND
	7-8	27
CNC30-B26	3-4	ND
	5-6	ND
	7-8	ND
CNC30-B27	3-4	ND

TABLE 4 (Continued)

SUMMARY OF OVA SOIL SCREENING RESULTS
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Depth (feet)	Organic Vapor Headspace Concentration
CNC30-B27	6-7	ND
CNC30-B28	3-4	16
	6-7	160
CNC30-B29	3-4	ND
	7-8	ND
	11-12	ND
CNC30-B30	7-8	ND
CNC30-B31	3-4	ND
	6-7	ND
CNC30-B32	6-7	ND
	7-8	ND
CNC30-B33	3-4	46
	5-6	20
CNC30-B34	3-4	ND
	7-8	ND
CNC30-B35	3-4	ND
	5-6	ND
CNC30-B36	3-4	ND
	5-6	ND
CNC30-B37	5-6	ND

Notes:
OVA - organic vapor analyzer equipped with a flame ionization detector

TABLE 5

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR SOIL
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Sample Depth (feet)	Mobile Laboratory Screening Data [1]					
			Benzene (ug/kg)	Toluene (ug/kg)	Ethylbenzene (ug/kg)	Total Xylenes (ug/kg)	Naph-thalene (ug/kg)	Diesel Range Organics (mg/kg)
CNC30-B01	30SFB01-0708	7-8	<5.0	<5.0	<5.0	<5.0	850	470
CNC30-B02	30SFB02-0607	6-7	<5.0	<5.0	<5.0	<5.0	<5.0	37
CNC30-B03	30SFB03-0607	6-7	<5.0	<5.0	<5.0	<5.0	<5.0	15
CNC30-B04	30SFB04-0607	6-7	<5.0	<5.0	<5.0	<5.0	<5.0	<10
CNC30-B05	30SFB05-0708	7-8	<5.0	<5.0	<5.0	<5.0	12	21
CNC30-B06	30SFB06-0708	7-8	<5.0	<5.0	<5.0	<5.0	<5.0	13
CNC30-B07	30SFB07-0607	6-7	<5.0	<5.0	<5.0	<5.0	<5.0	11
CNC30-B08	30SFB08-0708	7-8	<5.0	<5.0	<5.0	<5.0	<5.0	<10
CNC30-B09	30SFB09-0708	7-8	<5.0	<5.0	<5.0	<5.0	<5.0	<10
CNC30-B10	30SFB10-0708	7-8	<5.0	<5.0	<5.0	<5.0	<5.0	13
CNC30-B11	30SFB11-0607	6-7	<5.0	<5.0	<5.0	<5.0	<5.0	<10
CNC30-B12	30SFB12-0607	6-7	<5.0	<5.0	<5.0	<5.0	<5.0	<10
CNC30-B13	30SFB13-0607	6-7	<5.0	<5.0	<5.0	<5.0	<5.0	14
CNC30-B14	30SFB14-0304	3-4	<5.0	<5.0	<5.0	<5.0	450	<10
CNC30-B15	30SFB15-0405	4-5	<5.0	<5.0	<5.0	<5.0	<5.0	<10
CNC30-B16	30SFB16-0910	9-10	ND	ND	ND	ND	ND	7710E
CNC30-B17	30SFB17-0910	9-10	ND	ND	250	271.6	981	70100E
CNC30-B18	30SFB18-0708	7-8	ND	ND	ND	ND	ND	ND
CNC30-B19	30SFB19-0708	7-8	ND	ND	ND	ND	ND	ND
CNC30-B20	30SFB20-0708	7-8	ND	ND	413	566	693E	67900E
CNC30-B21	30SFB21-0708	7-8	ND	ND	ND	ND	ND	9720
CNC30-B22	30SFB22-0708	7-8	ND	ND	ND	ND	ND	ND
CNC30-B23	30SFB23-1011	10-11	ND	ND	ND	ND	ND	ND
CNC30-B24	30SFB24-0708	7-8	ND	ND	ND	ND	ND	ND
CNC30-B25	30SFB25-0607	6-7	ND	ND	ND	ND	ND	ND
CNC30-B26	30SFB26-0607	6-7	ND	ND	ND	ND	ND	ND
CNC30-B27	30SFB27-0607	6-7	ND	ND	ND	ND	ND	ND
CNC30-B28	30SFB28-0607	6-7	ND	ND	ND	ND	ND	ND
CNC30-B29	30SFB29-1112	11-12	ND	ND	ND	ND	ND	ND
CNC30-B30	30SFB30-0708	7-8	ND	ND	ND	ND	ND	ND
CNC30-B31	30SFB31-0607	6-7	ND	ND	ND	ND	ND	ND
CNC30-B32	30SFB32-0607	6-7	ND	ND	ND	ND	ND	ND
CNC30-B33	30SFB33-0506	5-6	ND	ND	381	1059	486	17700E
CNC30-B34	30SFB34-0607	6-7	ND	ND	ND	ND	ND	ND
CNC30-B35	30SFB35-0506	5-6	ND	ND	ND	ND	ND	ND
CNC30-B36	30SFB36-0506	5-6	ND	ND	ND	ND	ND	ND
CNC30-B37	30SFB37-0506	5-6	ND	ND	ND	ND	ND	ND

NOTES:
[1] Mobile laboratory screening data were analyzed using USEPA Method 8021/8015M. Compounds not detected are reported as less than the instrument detection limit or ND as identified on the laboratory reports.

ug/kg Micrograms per kilogram
mg/kg Milligrams per kilogram
ND - Not detected
E - Concentration exceeded the instrumentation calibration range for the analyte

TABLE 6

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR GROUNDWATER
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Laboratory Screening Data [1]					
		Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Naph-thalene (ug/L)	Diesel Range Organics (mg/L)
CNC30-B01	30GFB01-11	30	9.2	130	5.8	3200	41
CNC30-B02	30GFB02-11	51	21	110	5.1	5500	73
CNC30-B03	30GFB03-11	39	12	85	3	8500	32
CNC30-B04	30GFB04	53	15	120	10	5100	120
CNC30-B05	30GFB05-12	2.2	<1.0	15	<1.0	380	3.8
CNC30-B06	30GFB06-11	1.6	1.9	30	1.7	1900	5.9
CNC30-B07	30GFB07-12	<1.0	<1.0	<1.0	<1.0	<1.0	0.1
CNC30-B08	30GFB08-12	<1.0	1.4	14	43	1100	6.0
CNC30-B09	30GFB09-11	<1.0	<1.0	<1.0	<1.0	34	1.6
CNC30-B10	30GFB10-11	<1.0	<1.0	16	35.5	2300	240
CNC30-B11	30GFB11-11	<1.0	<1.0	<1.0	<1.0	<1.0	0.1
CNC30-B12	30GFB12-13	19	<1.0	95	21.9	2300	>250
CNC30-B13	30GFB13-12	1.1	<1.0	4.3	<1.0	240	0.7
CNC30-B14	30GFB14-12	<1.0	<1.0	<1.0	<1.0	15000	>250
CNC30-B15	30GFB15-11	<1.0	2.9	<1.0	3.6	58	0.1
CNC30-B16	30GFB160910	ND	ND	57.0	798E	1326E	433
CNC30-B17	30GFB171016	ND	ND	75.9	26.5	562	81
CNC30-B18	30GFB181012	ND	ND	ND	ND	ND	ND
CNC30-B19	30GFB190708	ND	ND	ND	ND	ND	ND
CNC30-B20	30GFB200812	ND	ND	195	404.5E	1479E	165
CNC30-B21	30GFB210812	ND	ND	88.2	51.3	102	16.0
CNC30-B22	30GFB221012	ND	ND	ND	ND	ND	ND
CNC30-B23	30GFB231116	ND	ND	ND	ND	ND	ND
CNC30-B24	30GFB240712	ND	ND	ND	ND	ND	ND
CNC30-B25	30GFB250708	ND	ND	ND	ND	33.4	ND
CNC30-B26	30GFB260712	ND	ND	ND	ND	ND	ND
CNC30-B27	30GFB270712	ND	ND	ND	ND	ND	ND
CNC30-B28	30GFB280612	ND	ND	ND	ND	ND	ND
CNC30-B29	30GFB291112	ND	ND	ND	ND	ND	ND
CNC30-B30	30GFB300712	ND	ND	ND	ND	142	42.5
CNC30-B31	30GFB310912	ND	ND	227	540	1027E	203E
CNC30-B32	30GFB320810	ND	ND	117	ND	270	18.1
CNC30-B33	30GFB330712	ND	ND	81.2	28.8J	581E	40.0
CNC30-B34	30GFB341012	ND	ND	ND	ND	ND	ND
CNC30-B35	30GFB350712	ND	ND	ND	ND	ND	ND
CNC30-B36	30GFB360506	ND	ND	ND	ND	ND	ND
CNC30-B37	30GFB370612	ND	ND	ND	ND	ND	ND
CNC30-MW08	30GFM080608	ND	ND	ND	ND	ND	ND
CNC30-MW14	30GFM140709	ND	ND	ND	ND	ND	ND

NOTES:
[1] Laboratory screening data were analyzed using USEPA Method 8020/8015M. Compounds not detected are reported as less than the instrument detection limit or as ND as identified on the laboratory reports.

ug/L Micrograms per liter
mg/L Milligrams per liter
ND Not detected

E Concentration exceeded the instrumentation calibration range for the analyte
J Concentration between minimum detection limit and practical quantitation level

TABLE 7

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN SOIL
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Soil Boring / Sample No.	Sample Date	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl-benzene (ug/kg)	Xylenes (total) (ug/kg)	Benzo(a) anthracene (ug/kg)	Benzo(b) fluoranthene (ug/kg)	Benzo(k) fluoranthene (ug/kg)	Chrysene (ug/kg)	Dibenzo(a,h) anthracene (ug/kg)	Naphthalene (ug/kg)
RBSL [1]		5	1622	1260	42471	73084	29097	231109	12998	87866	210
CNC30-B01 / 30SLB010708	28-Jun-99	< 6	< 6	< 6	< 6	< 360	< 360	< 360	< 360	< 360	13
CNC30-B05 / 30SLB050708	28-Jun-99	< 6	< 6	< 6	< 6	< 360	< 360	< 360	< 360	< 360	< 6
CNC30-B14 / 30SLB140304	28-Jun-99	< 7	< 7	< 7	< 7	< 360	< 360	< 360	< 360	< 360	< 7
CNC30-B16 / 30SLB160708	28-Jun-99	< 7	< 7	< 7	< 7	< 360	< 360	< 360	< 360	< 360	< 7
CNC30-B17 / 30SLB170708	12-Oct-99	< 5	< 5	200	150	< 3600	< 3600	< 3600	< 3600	< 3600	46000
CNC30-B17/ 30SLB170910D[3]	28-Jun-99	< 6	< 6	< 6	< 6	< 330	< 330	< 330	< 330	< 330	< 6
CNC30-B20 / 30SLB200607	19-Aug-99	< 6	10	< 6	< 6	< 330	< 330	< 330	< 330	< 330	17
CNC30-B21 / 30SLB210708	19-Aug-99	< 300	< 300	3900	5400	< 8200	< 8200	< 8200	< 8200	< 8200	39600
CNC30-B33 / 30SLB330506	19-Aug-99	< 340	< 340	3000	< 340	< 2100	< 2100	< 2100	< 2100	< 2100	50000
CNC30-TL[2] / 30TL00101	19-Aug-99	< 5	< 5	< 5	< 5	NA	NA	NA	NA	NA	< 5

All concentrations are in micrograms per kilograms (ug/kg).
NA - Not Analyzed
[1] South Carolina Department of Health and Environmental Control Risk Based Screening Levels for sandy soils; depth to groundwater less than 5 feet.
[2] Trip blank
[3] Duplicate sample

TABLE 8

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN GROUNDWATER
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Monitoring Well/ Sample No.	Sample Date	Benzene (ug/L)	Ethyl-benzene (ug/L)	Toluene (ug/L)	Xylenes (total) (ug/L)		MTBE (ug/L)	Naphthalene (ug/L)	Benzo(a) anthracene (ug/L)	Benzo(b) fluoranthene (ug/L)	Benzo(k) fluoranthene (ug/L)	Chrysene (ug/L)	dibenzo(a,h) anthracene (ug/L)
RBSL[1]		5	700	1000	10000		40	10 [2]	10 [2]	10 [2]	10 [2]	10 [2]	10 [2]
CNC30MW01 / 30GLM0101	22-Aug-99	< 5	38	< 5	29		< 5	470	< 10	< 10	< 10	< 10	< 10
CNC30MW02 / 30GLM0201	11-Jul-99	< 5	< 5	< 5	< 5		< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW03 / 30GLM0301	22-Aug-99	< 5	< 5	< 5	4 [J]		< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW04 / 30GLM0401	12-Jul-99	< 5	18	< 5	14		< 5	64	< 10	< 10	< 10	< 10	< 10
CNC30MW05 / 30GLM0501	22-Aug-99	< 5	< 5	< 5	< 5		< 5	4 [J]	< 10	< 10	< 10	< 10	< 10
CNC30MW06 / 30GLM0601	12-Jul-99	< 5	< 5	< 5	< 5		< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW06 / 30GLM0601D[3]	12-Jul-99	< 5	< 5	< 5	< 5		< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW07 / 30GLM0701	22-Aug-99	< 5	< 5	< 5	< 5		< 5	< 5	< 10	< 10	< 10	< 10	< 10

TABLE 8 (Continued)

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN GROUNDWATER
SITE 30, BUILDING NH46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Monitoring Well/ Sample No.	Sample Date	Benzene (ug/L)	Ethyl-benzene (ug/L)	Toluene (ug/L)	Xylenes (total) (ug/L)	EDB (ug/L)	MTBE (ug/L)	Naphthalene (ug/L)	Benzo(a) anthracene (ug/L)	Benzo(b) fluoranthene (ug/L)	Benzo(k) fluoranthene (ug/L)	Chrysene (ug/L)	dibenzo(a,h) anthracene (ug/L)
RBSL[1]		5	700	1000	10000	5	40	10 [2]	10 [2]	10 [2]	10 [2]	10 [2]	10 [2]
CNC30MW08 / 30GLM0801	10-Jul-99	< 5	< 5	< 5	< 5	<5	< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW09 / 30GLM0901	12-Jul-99	< 5	< 5	< 5	< 5	<5	< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW10 / 30GLM1001	10-Jul-99	< 5	140	< 5	22	<5	< 5	410	< 10	< 10	< 10	< 10	< 10
CNC30MW11 / 30GLM1101	10-Jul-99	< 5	< 5	< 5	< 5	<5	< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW12D / 30GLM1201	27-Jul-99	< 5	< 5	< 5	< 5	<5	< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW13D / 30GLM1301	12-Jul-99	< 5	< 5	< 5	< 5	<5	< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30MW14 / 30GLM1401	11-Jul-99	< 5	< 5	< 5	< 5	<5	< 5	< 5	< 10	< 10	< 10	< 10	< 10
CNC30TL[4] / 30TL00101	10-Jul-99	< 5	< 5	< 5	< 5	<5	< 5	< 5	NA	NA	NA	NA	NA

All concentrations are in ug/L.

NA - Not analyzed

EDB - 1,2-dibromoethane

(1) South Carolina Department of Health and Environmental Control Risk Based Screening Levels for ground water.

(2) The Risk based screening level for individual PAH CoC is 10 ug/l or 25 ug/l for total PAHs.

(3) Trip blank

(J) Indicates presence of analyte at a concentration less than the reporting limit and greater than the detection limit.

TABLE 9

FATE AND TRANSPORT INPUT PARAMETERS
SITE 30, BUILDING NH46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Parameter	Domenico Dilution/Attenuation Model[1]
Hydraulic Conductivity [m/sec]	1.43E-05
Hydraulic Gradient	0.0105
Porosity[a]	0.47
Estimated Plume Length [ft]	NA
Soil Bulk Density[a] [kg/L]	1.45
Fractional Organic Carbon	4.83E-03
First Order Decay Rate[a] [sec^{-1}]	0
Modeled Plume Length [ft]	NA
Modeled Plume Width [ft]	NA
Source Width[a] [m]	15
Source Thickness[a] [m]	2
Soluble Mass [kg]	Infinite[b]

(1) - *South Carolina Risk-Based Corrective Action for Petroleum Releases,* South Carolina Department of Health and Environmental Control, 1998.
(a) - Stated values are default values.
(b) - Assumption of the Domenico Model
NA - Not available

TABLE 10

COMPARISON OF MAXIMUM CONCENTRATIONS TO RBSLs
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Chemical of Concern	Maximum Concentration (Soil) (mg/kg)	Soil LeachingRBSLs (Sandy Soil) (mg/kg)[a]	Maximum Concentration (GW) (mg/L)	RBSLs (GW) (mg/L)[b]
Benzene	**< 0.034**	0.005	<0.005	0.005
Toluene	< 0.340	1.622	< 0.005	1
Ethybenzene	**3.9**	1.26	0.14	0.7
Xylenes	5.4	42.471	0.029	10
MTBE	NA	NA	< 0.005	0.04
Naphthalene	**50**	0.21	**0.47**	0.010

(a) - From Risk-Based Corrective Action for Petroleum Releases, Table B3, Depth to GW - <5 feet, SCDHEC RBCA Guidelines, 1998.

(b) - From Risk-Based Corrective Action for Petroleum Releases, Table B1, SCDHEC RBCA Guidelines, 1998.

GW - Groundwater

RBSLs - Risk-Based Screening Levels

Shaded cell indicates the concentration exceeded the RBSL.

TABLE 11

EXPOSURE PATHWAY ASSESSMENT – CURRENT LAND USE
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Media	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure Point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	No basements present at CNC. No explosion hazard.	
	Explosion Hazard	No		
Groundwater	Ingestion	No	No current groundwater pathways complete. Drinking water provided by city.	
	Dermal contact	No		
	Inhalation	No		
Surface Water	Ingestion	No	No surface water bodies within 1,000 feet.	
	Dermal contact	No		
	Inhalation	No		
Surficial Soil	Ingestion	No	No surficial soil impact.	
	Dermal contact	No		
	Inhalation	No		
Subsurface Soil	Ingestion	No	No current complete pathways.	
	Dermal contact	No		
	Inhalation	No		

TABLE 12

EXPOSURE PATHWAY ASSESSMENT – FUTURE LAND USE
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Media	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure Point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	In basements present at CNC. No explosion hazard.	
	Explosion Hazard	No		
Groundwater	Ingestion	Yes	Groundwater exposure by potential construction worker (most likely in utility corridor). Both direct exposure and exposure by soil leaching to groundwater evaluated.	No additional data needed.
	Dermal contact	Yes		
	Inhalation	Yes		
Surface Water	Ingestion	No	No surface water bodies within 1,000 feet.	
	Dermal contact	No		
	Inhalation	No		
Surficial Soil	Ingestion	No	No surficial soil impact, subsurface soil evaluated as surface soil for construction worker as direct contact likely in utility trench.	
	Dermal contact	No		
	Inhalation	No		
Subsurface Soil	Ingestion	Yes	Soil exposure by potential construction worker (most likely in utility corridor). Although there is no surficial soil impact, subsurface soil evaluated as surface soil for construction worker as direct contact likely in utility trench.	No additional data needed
	Dermal contact	Yes		
	Inhalation	No		

FIGURES

0 2000 4000
SCALE IN FEET

SOURCE: QUADRANGLE MAP SOUTH CAROLINA, REVISED 1979
QUADRANGLE MAP NORTH CHARLESTON REVISED, 1979

DRAWN BY HJP DATE 11/5/99			CONTRACT NO. 0164
CHECKED BY DATE			APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1 / REV. 0

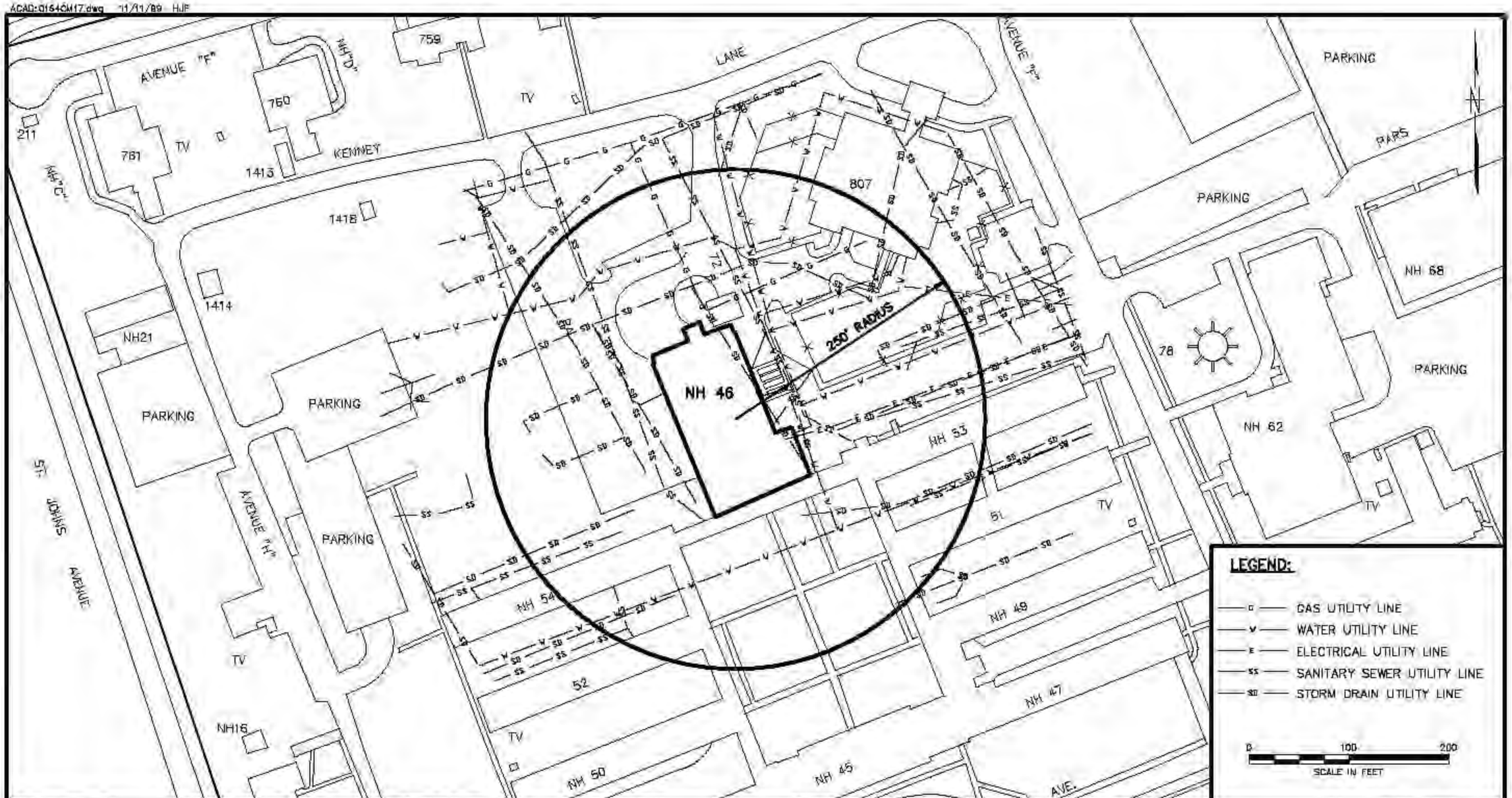
DEPARTMENT OF THE NAVY — SOUTHERN DIV FACILITIES ENGINEERING COMD

SITE LOCATION MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

ACAD:0164CM16.dwg 11/05/99 HJP

FORM CADD NO. SDIV_AV.DWG - REV 0 - 1/20/98

ACAD:0164CM17.dwg 11/11/99 HJF



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

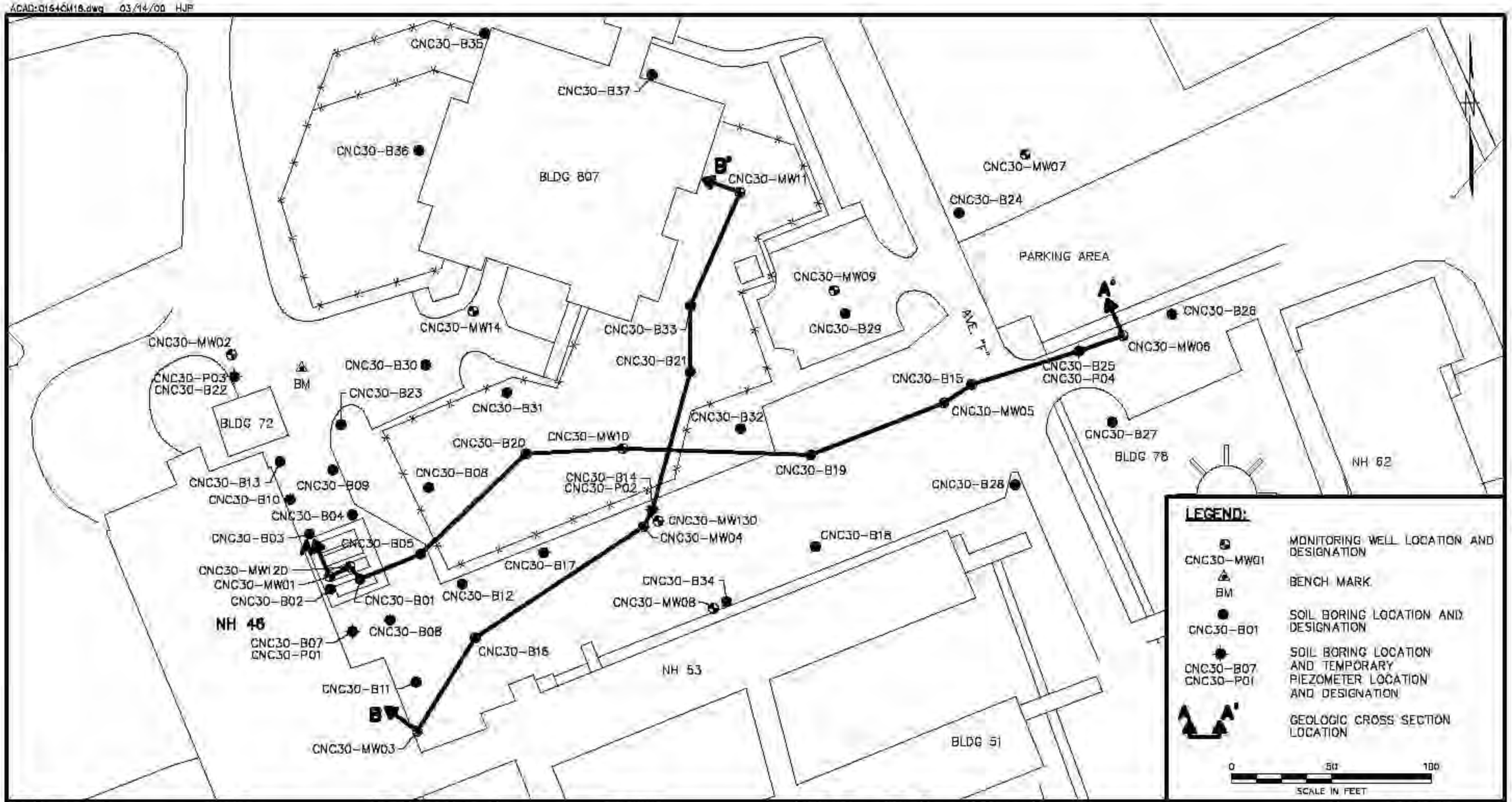
DRAWN BY HJF DATE 11/5/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE VICINITY MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 2
REV. 0

FORM CADD NO. 2DIV_B-1.DWG — REV. 0 — 1/20/98

ACAD:0164CM18.dwg 03/14/00 HJP



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES
1	1-28-00	REVISION TO DRAFT RAR	G.G		P.C.	

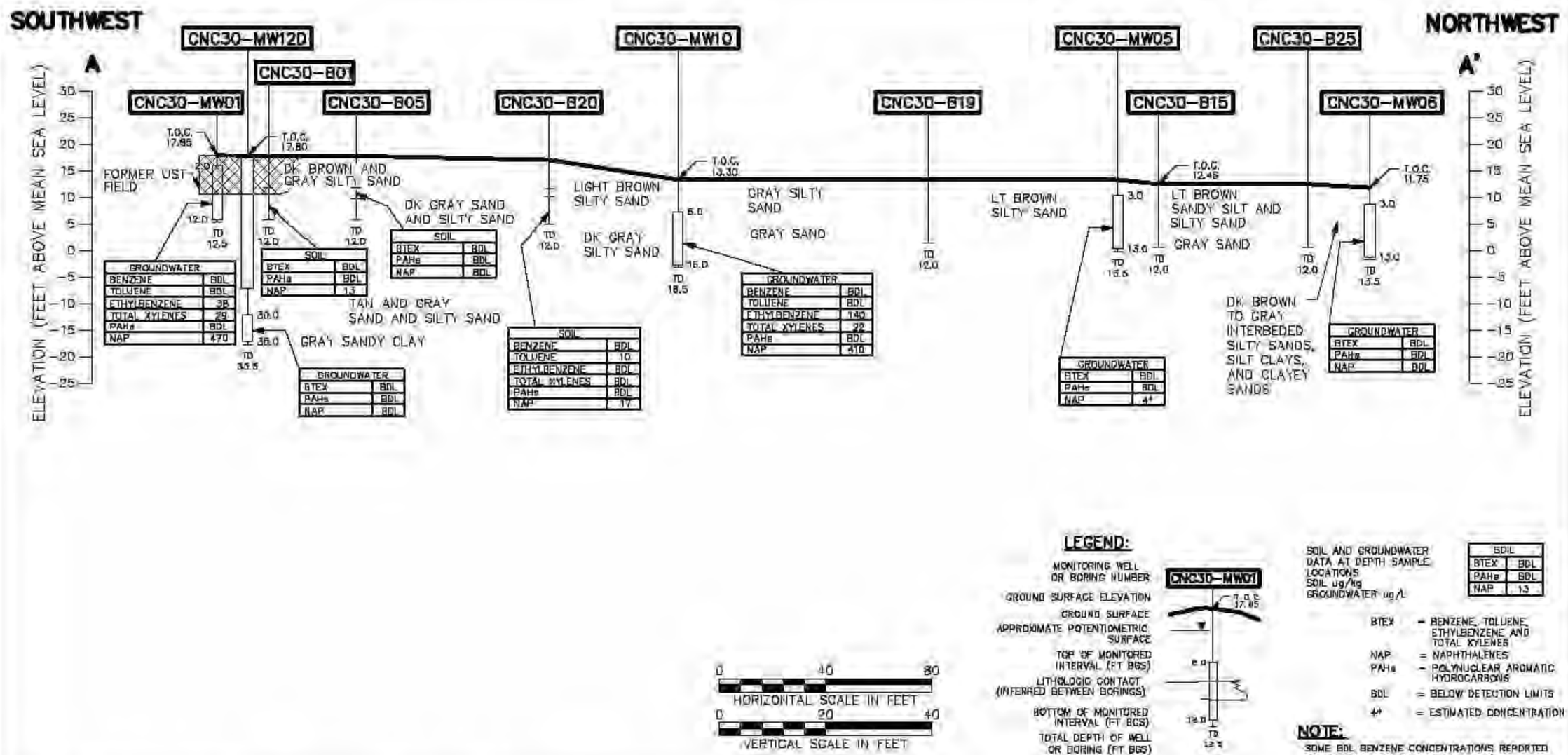
DRAWN BY HJP DATE 11/5/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE MAP AND SAMPLING LOCATIONS
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 3
REV. 1

FORM CADD NO. SDN_9H.DWG — REV 0 — 1/20/98

ACAD:0164GK05.dwg 03/14/00 HJP



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES
1	1-28-00	REVISION TO DRAFT RAR	G.G.		P.C.	

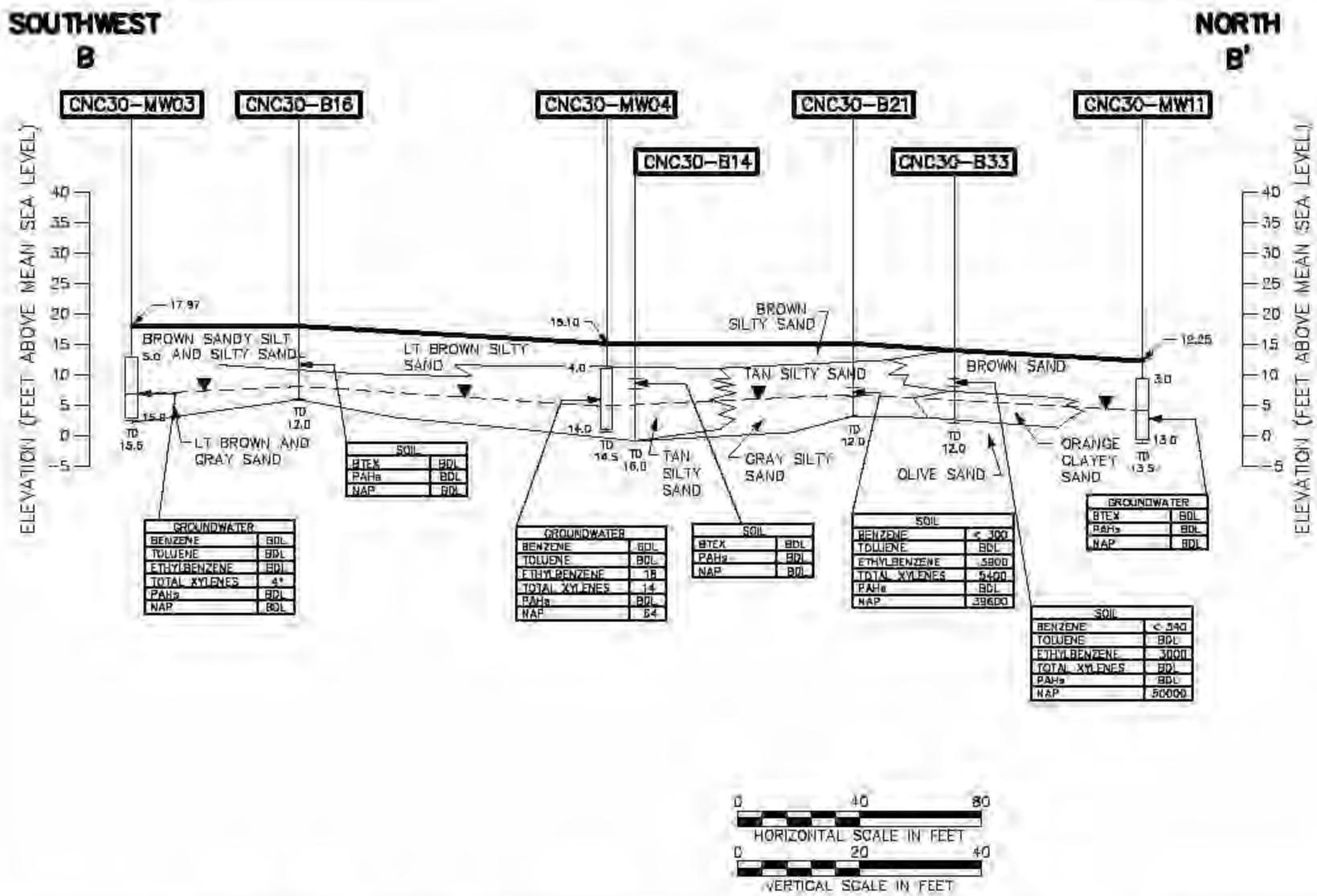
DRAWN BY HJP DATE 11/9/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GEOLOGICAL CROSS SECTION A-A'
SITE 30, BUILDING NH 48
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

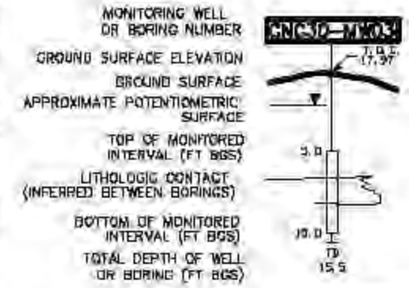
CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 4
REV. 1

FORM CADD NO. CDIV_B-TAWG – REV. 0 – 3/20/98

ACAD:0164GK06.dwg 03/14/00 HJP



LEGEND:



SOIL AND GROUNDWATER DATA AT DEPTH SAMPLE LOCATIONS
SOIL (ug/kg)
GROUNDWATER (ug/L)

GROUNDWATER	
BENZENE	BDL
TOLUENE	BDL
ETHYLBENZENE	18
TOTAL XYLENES	14
PAHs	BDL
NAP	64

BTEX = BENZENE, TOLUENE, ETHYLBENZENE AND TOTAL XYLENES
NAP = NAPHTHALENES
PAHs = POLYNUCLEAR AROMATIC HYDROCARBONS
BDL = BELOW DETECTION LIMITS
4* = ESTIMATED CONCENTRATION

NOTE:

SOME BDL BENZENE CONCENTRATIONS REPORTED ABOVE THE BENZENE RBSL OF 5 ug/kg.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES
1	1-28-00	REVISION TO DRAFT RAR	C.G.		P.C.	

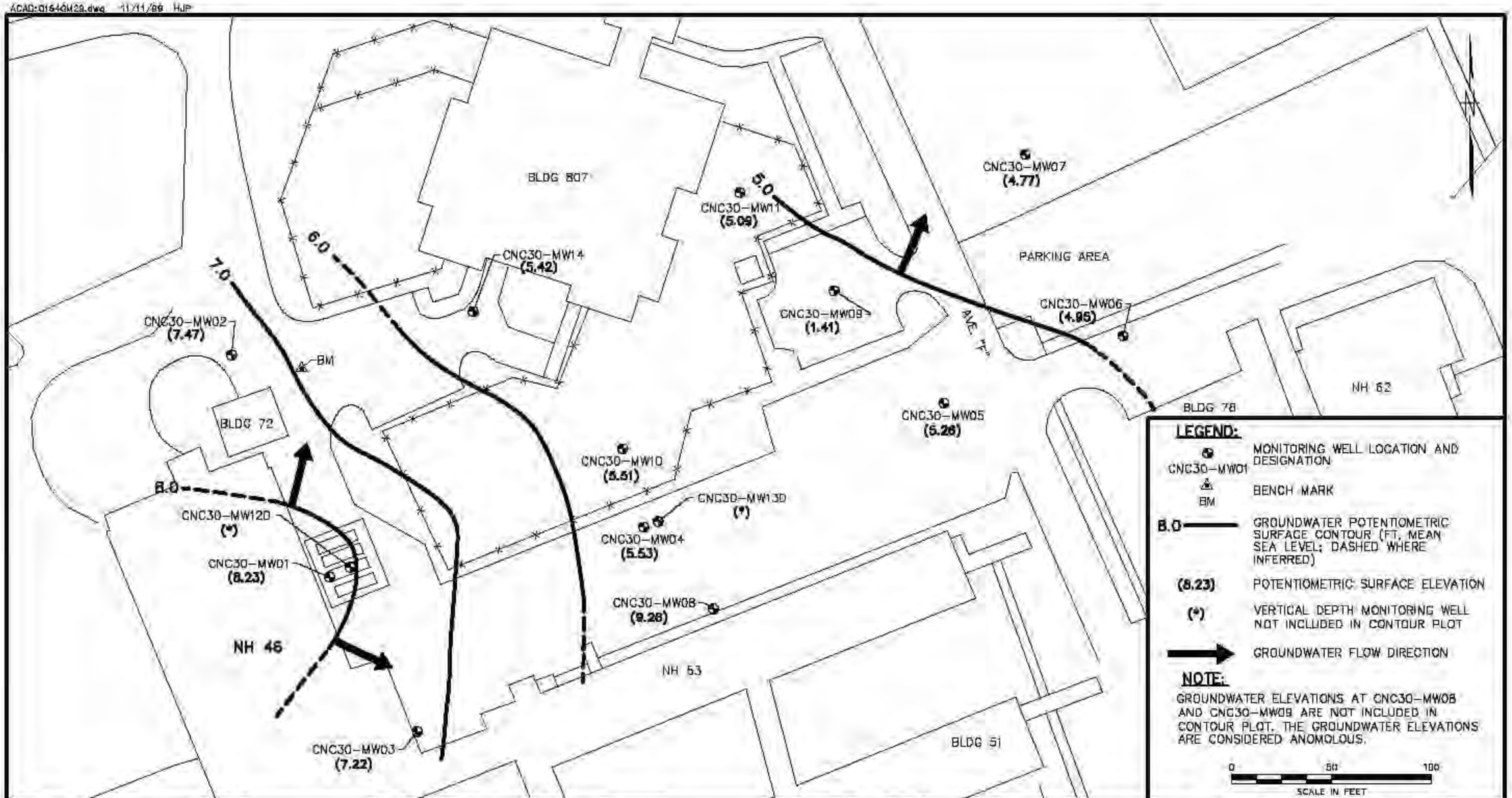
DRAWN BY HJP DATE 11/9/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GEOLOGICAL CROSS SECTION B-B'
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 5
REV. 1

FORM CADD NO. CDIV_B-12WG — REV. 0 — 1/20/98

ACAD:0164GM29.dwg 11/11/99 HJP



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

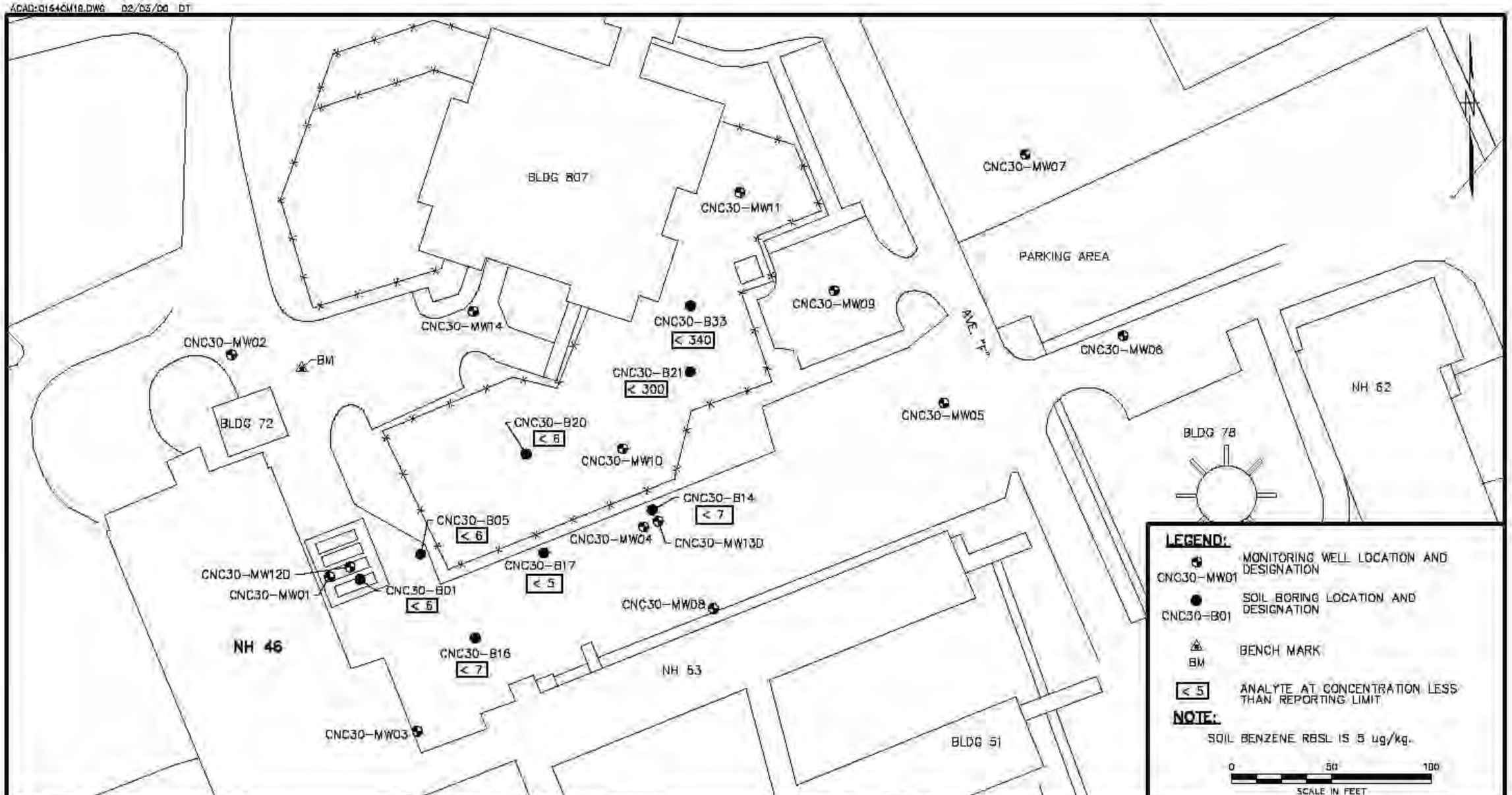
DRAWN BY HJP DATE 11/5/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GROUNDWATER POTENTIOMETRIC MAP (SEPTEMBER 11, 1999) SITE 30, BUILDING NH 46 ZONE C, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 6 REV. 0

FORM CADD NO. SDN_BH.DWG — REV 0 — 1/20/98

ACAD:0164CM18.DWG 02/03/00 DT



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES
1	1-28-00	REVISION TO DRAFT RAR	G.G		P.C.	

DRAWN BY HJP DATE 11/9/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

BENZENE SOIL CONCENTRATION MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 7
REV. 1

FORM CADD NO. SDN_9H.DWG — REV 0 — 1/20/98

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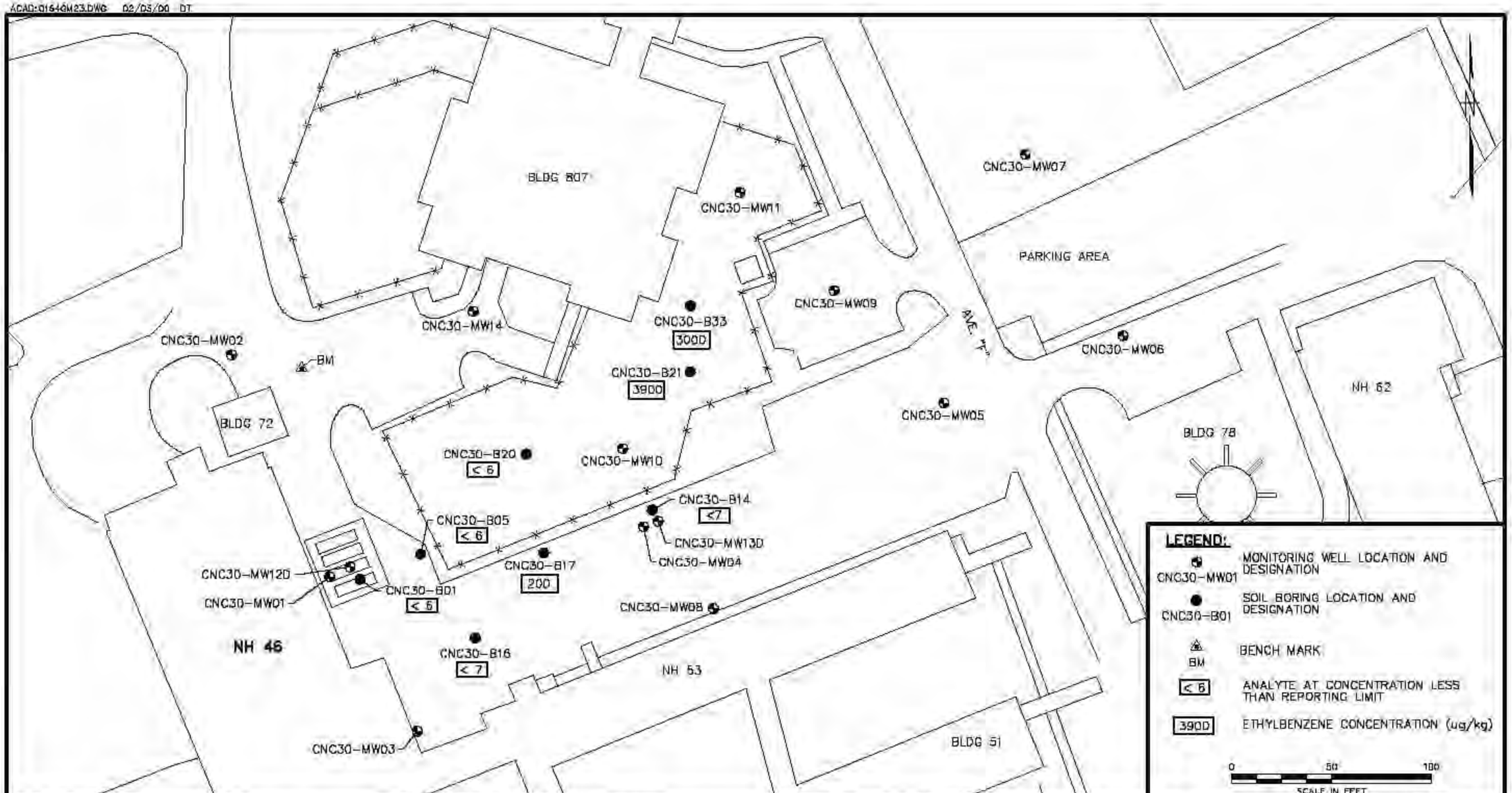


NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES
1	1-28-00	REVISION TO DRAFT RAR	C.G.		P.C.	

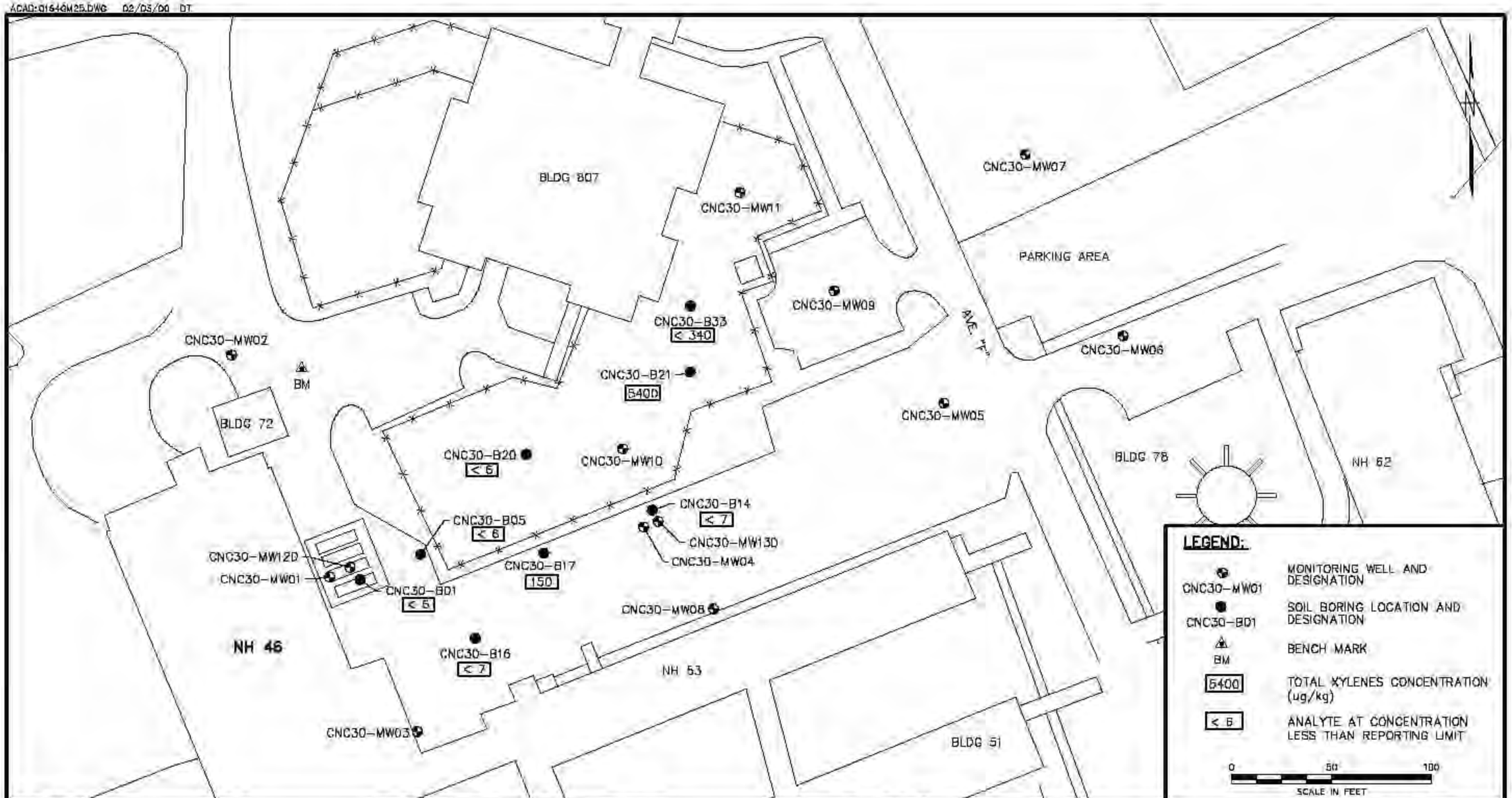
DRAWN BY HJP DATE 11/8/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

ETHYLBENZENE SOIL CONCENTRATION MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 8
REV. 1

FORM CADD NO. SDN_8H.DWG — REV 0 — 1/20/88

ACAD:0164GM25.DWG 02/03/00 DT



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES
1	1-28-00	REVISION TO DRAFT RAR	G.G.		P.C.	

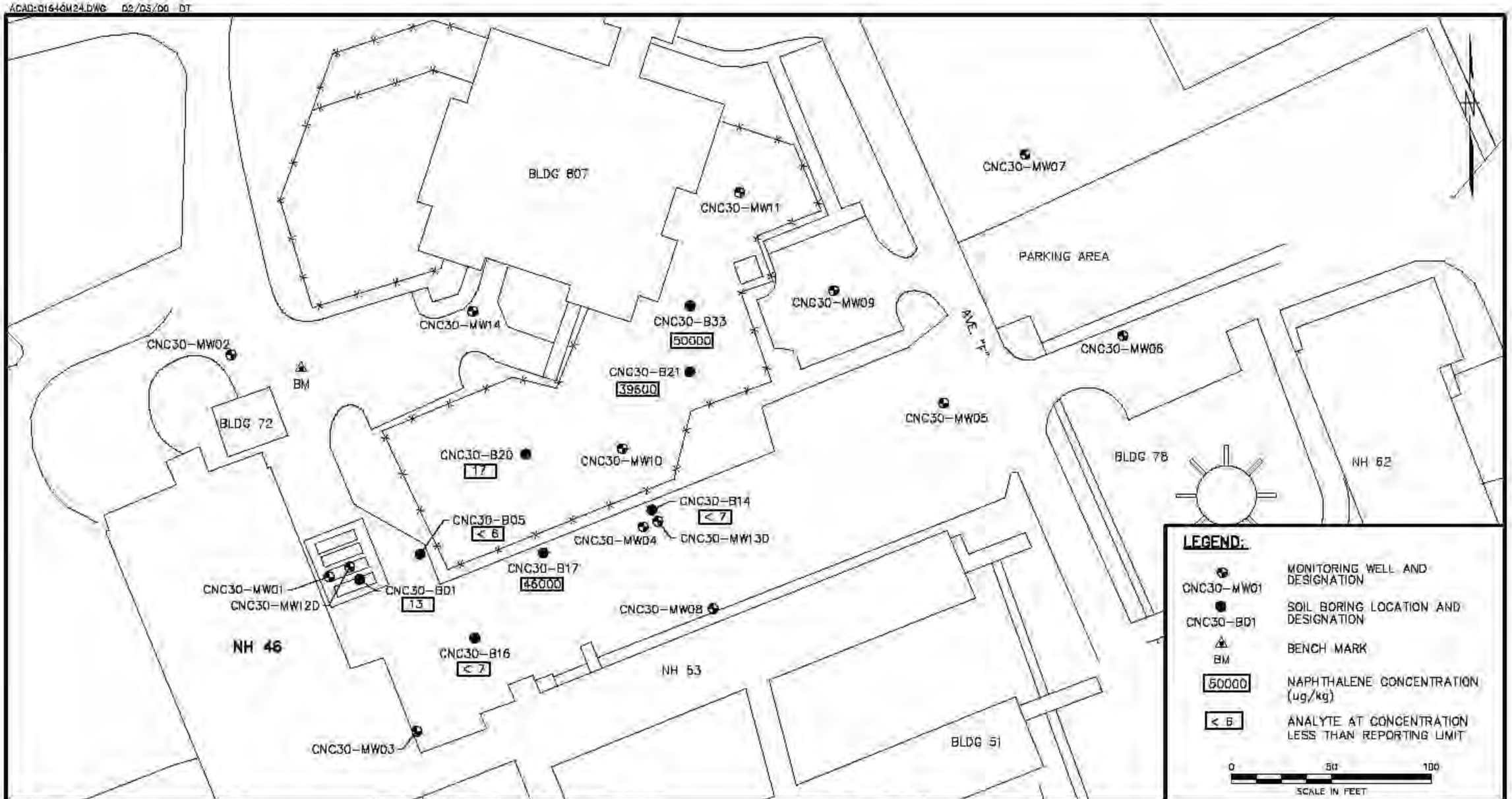
DRAWN BY HJP DATE 11/5/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

TOTAL XYLENES SOIL CONCENTRATION MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 9
REV. 1

FORM CADD NO. SDN_8H.DWG — REV 0 — 1/20/88

ACAD:0164GM24.DWG 02/03/99 DT



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES
1	1-28-00	REVISION TO DRAFT RAR	G.G.		P.C.	

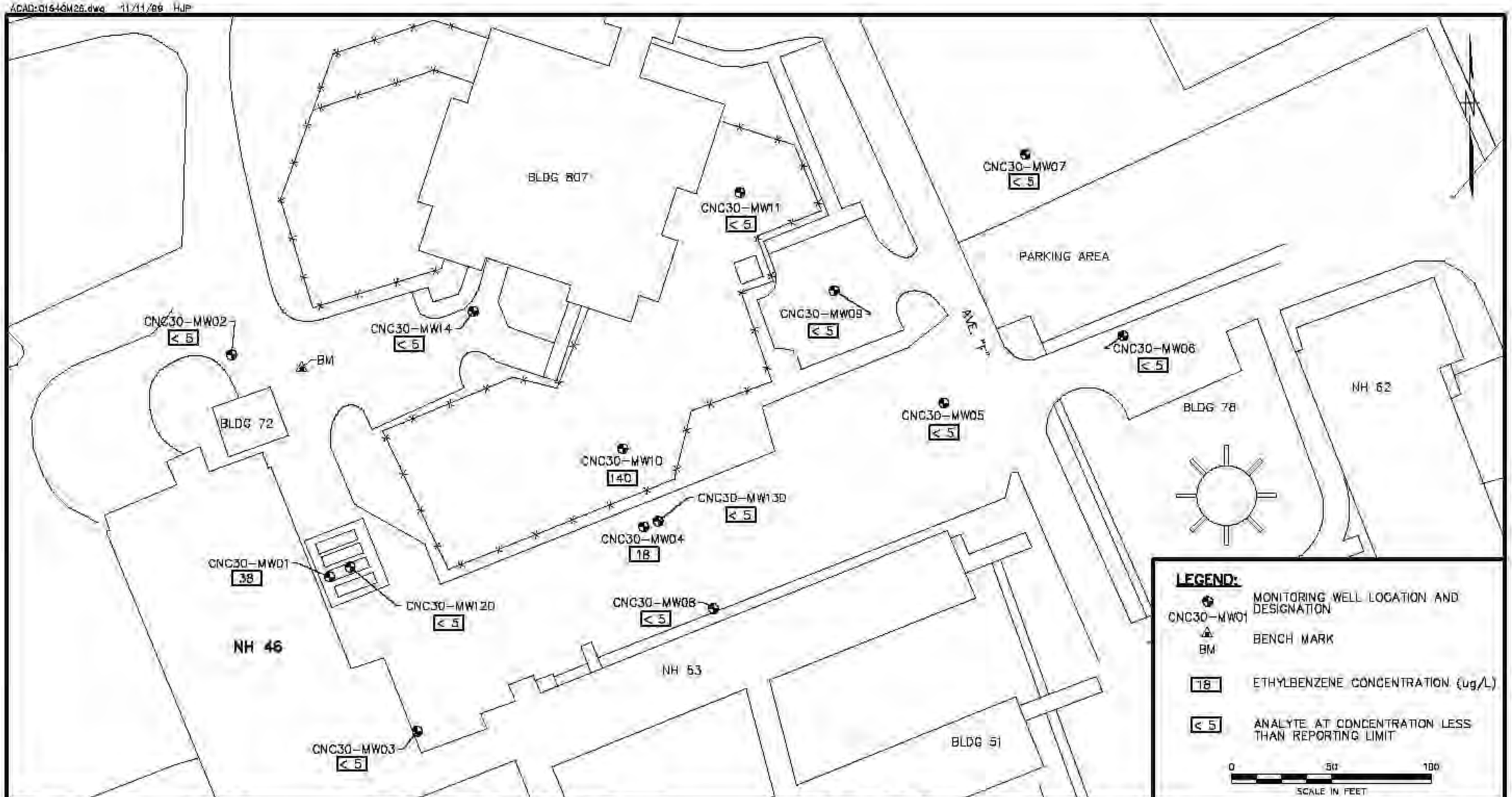
DRAWN BY HJP DATE 11/5/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

NAPHTHALENE SOIL CONCENTRATION MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 10
REV. 1

FORM CADD NO. SDN_BH.DWG — REV 0 — 1/20/98

ACAD:0164GM26.dwg 11/11/99 HJP



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 11/5/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

ETHYLBENZENE GROUNDWATER CONCENTRATION MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 11
REV. 0

FORM CADD NO. SDN_8H.DWG — REV 0 — 1/20/98

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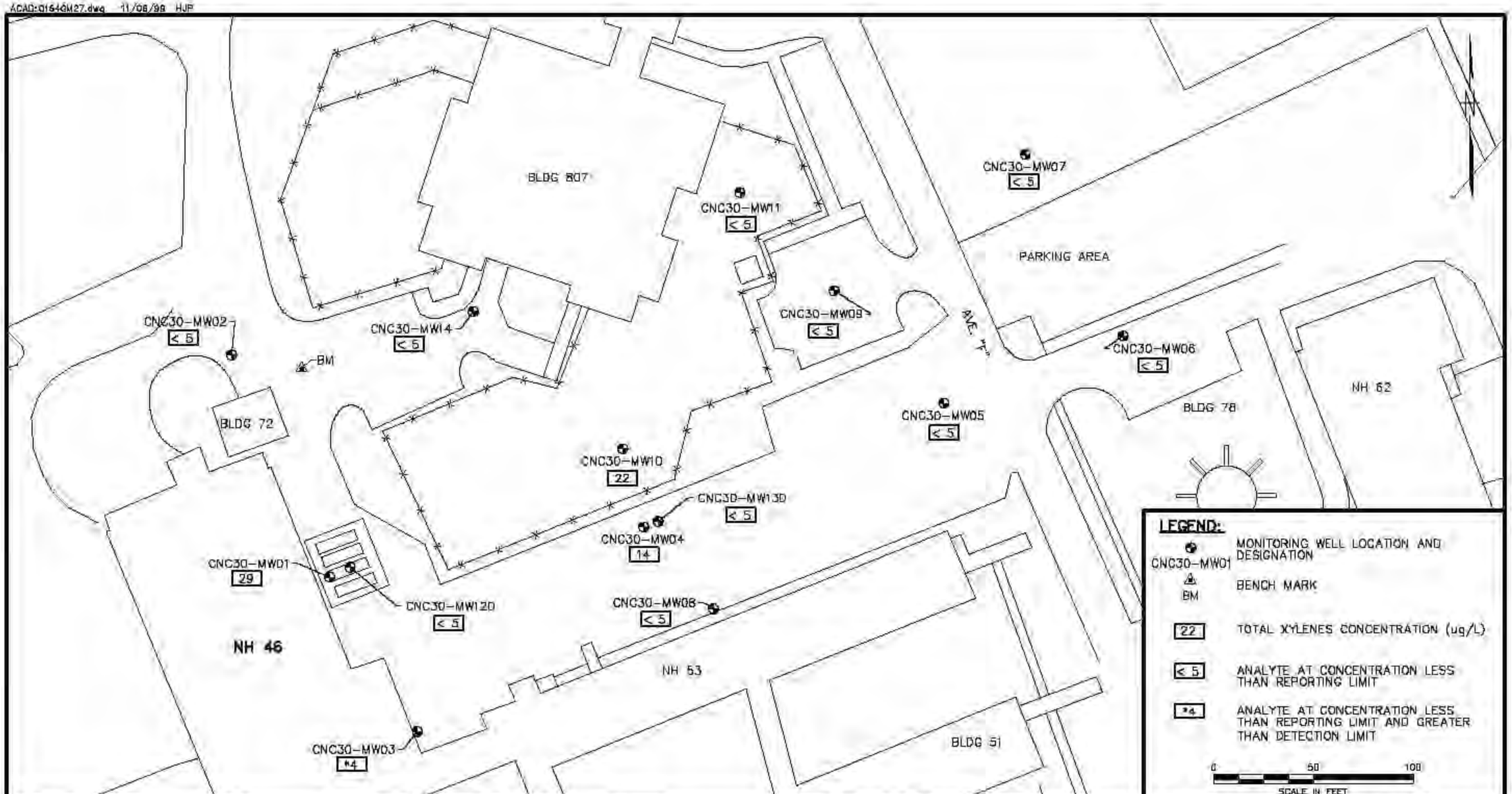

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 11/5/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

TOTAL XYLENES GROUNDWATER CONCENTRATION MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 12
REV. 0

FORM CADD NO. SDN_8H.DWG — REV 0 — 1/20/98

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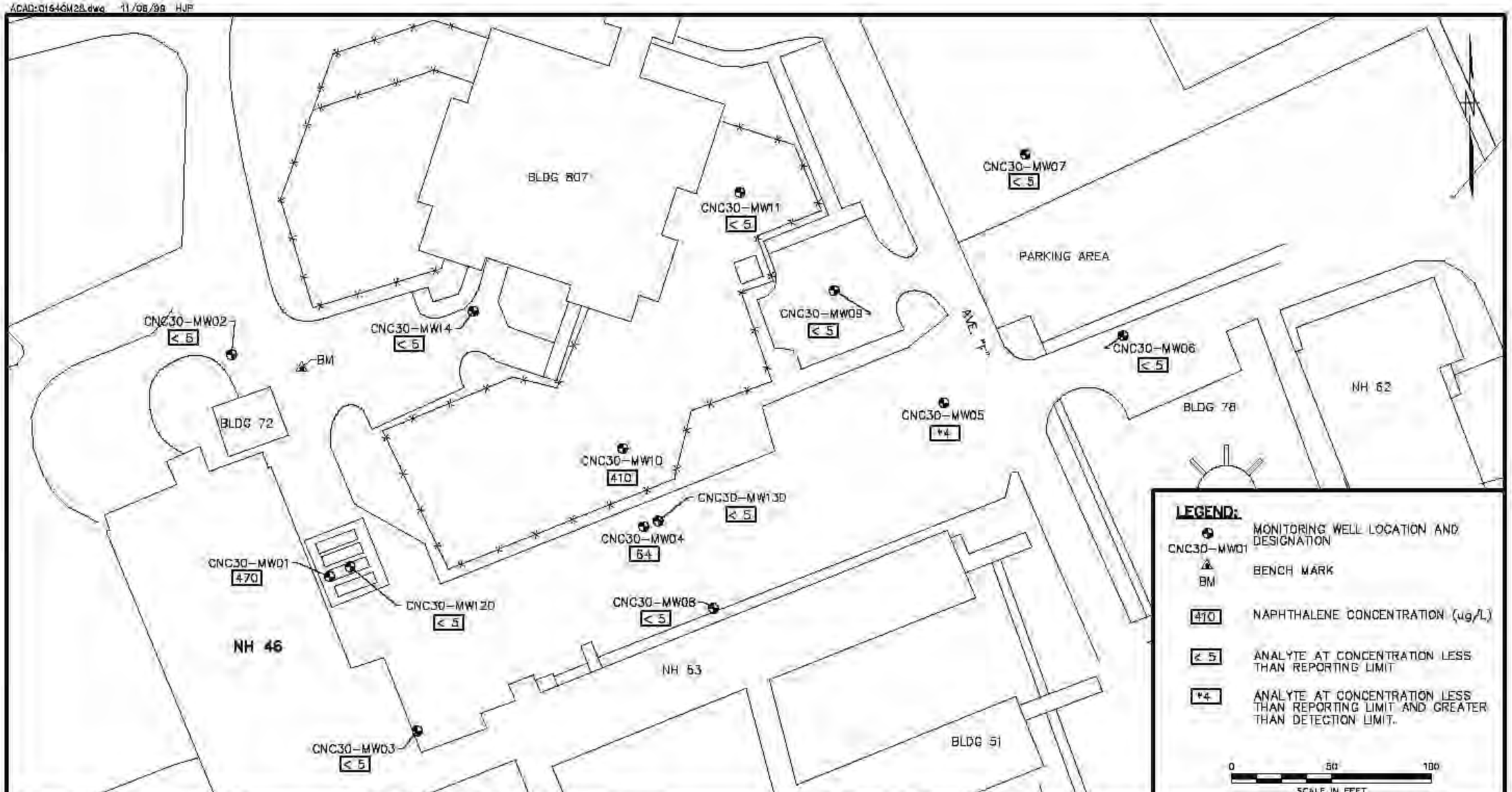


NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

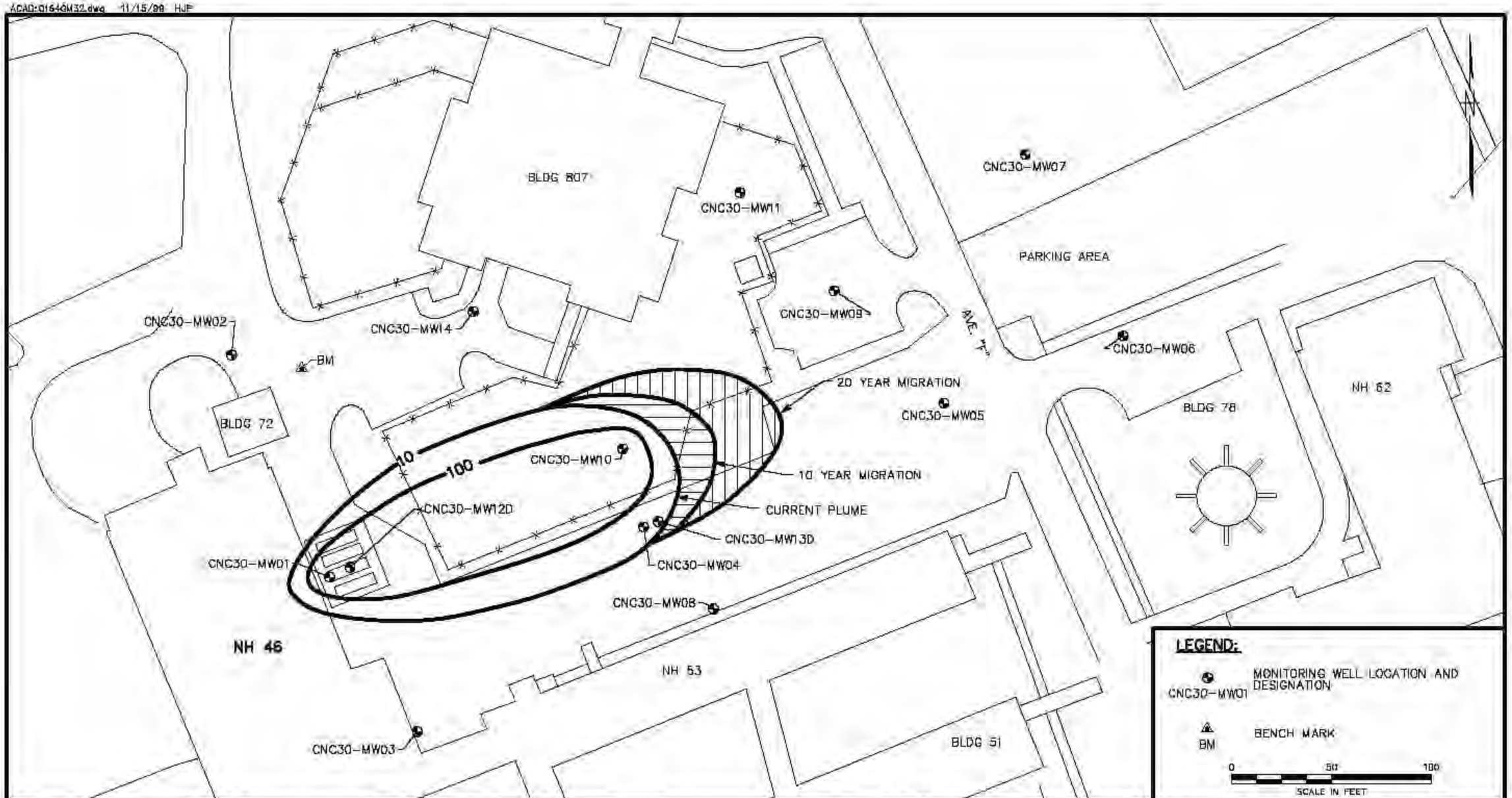
DRAWN BY HJP DATE 11/5/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GROUNDWATER NAPHTHALENE CONCENTRATION MAP
SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 13
REV. 0

FORM CADD NO. SDN_8H.DWG — REV 0 — 1/20/98

ACAD:0164GM32.dwg 11/15/99 HJP



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 11/12/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

10-YEAR AND 20-YEAR PLUME MIGRATION PREDICTION OF NAPHTHALENE SITE 30, BUILDING NH 46 ZONE C, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0164
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 14
REV. 0

FORM CADD NO. SDN_8H.DWG — REV 0 — 1/20/98

APPENDIX A

UNDERGROUND STORAGE TANK ASSESSMENT REPORT
USTs NH46-1 THROUGH NH46-4

South Carolina
DHEC
Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201-1708

Commissioner: Douglas E. Bryant

Board: John H. Burriss, Chairman
William M. Hull, Jr., MD, Vice Chairman
Roger Leaks, Jr., Secretary

Richard E. Jabbour, DDS
Cyndi C. Mosteller
Brian K. Smith
Rodney L. Grandy

Promoting Health, Protecting the Environment

Mr. Gabriel L. Magwood
Southern Division NFEC
P.O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Re: Underground Storage Tank Assessment Report dated (received) February 3, 1997
Building NH-46 (DHEC Site Identification # 17755)
Charleston Naval Complex/Charleston Naval Base (CNB)
Charleston, SC
Charleston County

Date: March 6, 1997

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the report provides analytical results of environmental sampling conducted to determine if releases have occurred from operation of the referenced underground storage tanks and/or associated piping system. The results presented indicate elevated levels of polynuclear aromatic hydrocarbons (PAH) were detected in soils grab samples obtained from the tank pit. These results exceed levels proposed in the Soil Corrective Action Plan (amended February 4, 1997) for the Charleston Naval Complex and appear to indicate that additional endeavors for remedial actions (soils removal) and contamination characterization are warranted at the referenced site. In this regard, assessment/corrective action activities provided in the Tank Management Plan (dated October 18, 1996) should be implemented in an appropriate and timely manner. Please be reminded that groundwater sampling (if necessary) will require construction of sampling points and will need to be submitted for prior review and approval, as appropriate.

Should you have any questions, please contact me at (803) 734-5328.

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Assessment and Development Section
Bureau of Water

cc: Trident District EQC

recycled paper

South Carolina Department of Health and Environmental Control (S.C.D.H.E.C.)
Underground Storage Tank (UST) Assessment Report

Date Received
State Use Only

Submit Completed Form to:
UST Regulatory Section
SCDHEC
2600 Bull Street
Columbia, South Carolina 29201
Telephone (803) 734-5331

I OWNERSHIP OF UST(S)

Agency/Owner: Southern Division, Naval Facilities Engineering Command, Caretaker Site Office

Mailing Address: P.O. Box 190010

City: N. Charleston State: SC Zip Code: 29419-9010

Area Code: 803 Telephone Number: 743-9985 Contact Person: LCDR Paul Rose

II SITE IDENTIFICATION AND LOCATION

Site I.D. #: Unregulated

Facility Name: Charleston Naval Base Complex, NH 46

Street Address: Turnbull Avenue

City: North Charleston, 29405-2413 County: Charleston

III CLOSURE INFORMATION

Closure Started: 15 Aug 1996 Closure Completed: 18 Sept 1996

Number of USTs Closed: 4

N/A	SPORTENVDETCHASN
Consultant	UST Removal Contractor

IV. CERTIFICATION (Read and Sign after completing entire submittal)

I certify that I have personally examined and am familiar with the information submitted in this and all attached documents; and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate and complete.

LCDR Paul Rose
Name (Type or Print)

Signature

V. UST INFORMATION

		Tank 1 NH46-1	Tank 2 NH46-2	Tank 3 NH46-3	Tank 4 NH46-4	Tank 5	Tank 6
A.	Product.....	Fuel oil	Fuel oil	Fuel oil	Fuel oil		
B.	Capacity.....	2500 gal	2500 gal	2500 gal	2500 gal		
C.	Age.....	1941	1941	1941	1941		
D.	Construction Material.....	Steel	Steel	Steel	Steel		
E.	Month/Year of Last Use.....	Unk. See note 1	Unk.	Unk.	Unk.		
F.	Depth (ft.) To Base of Tank.....	7'	7'	7'	7'		
G.	Spill Prevention Equipment Y/N.....	N	N	N	N		
H.	Overfill Prevention Equipment Y/N.....	N	N	N	N		
I.	Method of Closure Removed/Filled.....	R	R	R	R		
J.	Visible Corrosion or Pitting Y/N.....	Y	Y	Y	Y		
K.	Visible Holes Y/N.....	Y	Y	N	Y		

Note 1: The tanks had been abandoned at an unknown date.

L. Method of disposal for any USTs removed from the ground (attach disposal manifests)

The USTs were removed, drained, cut open at both ends, and cleaned with a steam cleaner. They were then cut up for recycling as scrap metal. (See Attachment III.)

M. Method of disposal for any liquid petroleum, sludges, or waste waters removed from the USTs (attach disposal manifests)

The residual fuel oil and waste water were recycled. The sludge was shipped out as non-regulated sludge waste.

N. If any corrosion, pitting, or holes were observed, describe the location and extent for each UST

Corrosion and pitting were found throughout all four tanks, with the more severe occurring on their bottom sides. Two holes (1/8" & 3/4") were found in UST NH46-1, one hole (1/4") was found in UST NH46-2, and one elongated hole (1" x 3") was found in UST NH46-4. All holes were located in the lower bottom portion of the side of the tanks. In addition, all tanks showed some degree of soil staining due to over fill, with soil staining from the fill pipe down along the side of the tank (see photo 7).

VI. PIPING INFORMATION

		Tank 1 NH46-1	Tank 2 NH46-2	Tank 3 NH46-3	Tank 4 NH46-4	Tank 5	Tank 6
A.	Construction Material	Steel	Steel	Steel	Steel		
B.	Distance from UST to Dispenser	6' See note 2	6'	6'	6'		
C.	Number of Dispensers	1 See note 2	1	1	1		
D.	Type of System P/S	S	S	S	S		
E.	Was Piping Removed from the Ground? Y/N	Y	Y	Y	Y		
F.	Visible Corrosion or Pitting Y/N	Y	Y	Y	Y		
G.	Visible Holes Y/N	N	N	N	N		
H.	Age	1941	1941	1941	1941		

Note 2: The USTs provided fuel oil to the boilers of NH 46.

I. If any corrosion, pitting, or holes were observed, describe the location and extent for each line.

The ventilation lines for each tank were corroded. The remaining piping was in good condition.

VII. BRIEF SITE DESCRIPTION AND HISTORY

Facility NH 46 was constructed in 1941 and served as part of the Naval Hospital complex. USTs NH46-1, NH46-2, NH46-3 and NH46-4 provided fuel oil to the boilers of NH 46. The tanks were abandoned at an unknown date.

VIII. SITE CONDITIONS

		Yes	No	Unk
A.	Were any petroleum-stained or contaminated soils found in the UST excavation, soil borings, trenches, or monitoring wells? [*Eastern end of tanks 1, 2 & 3.] If yes, indicate depth and location on the site map.	*X		
B.	Were any petroleum odors detected in the excavation, soil borings, trenches, or monitoring wells? If yes, indicate location on site map and describe the odor (strong, mild, etc.) [*Mild]	*X		
C.	Was water present in the UST excavation, soil borings, or trenches? If yes, how far below land surface (indicate location and depth)? _____		X	
D.	Did contaminated soils remain stockpiled on site after closure? If yes, indicate the stockpile location on the site map. Name of DHEC representative authorizing soil removal: _____		**X	
E.	Was a petroleum sheen or free product detected on any excavation or boring waters? If yes, indicate location and thickness on the site map.		X	

** All soils removed from the excavation were returned to the tank pit.

IX. SAMPLE INFORMATION

S.C.D.H.E.C. Lab Certification Number 10120

Sample #	Location	Sample Type (Soil/Water)	Depth*	Date/Time of Collection	Collected By	OVA#
SPORT 0149-1	East end of UST NH46-1.	Soil	7'	26 Aug 96 1035	R. Adkins	Not Taken
SPORT 0149-2	West end of UST NH46-1.	Soil	7'	26 Aug 96 1035	R. Adkins	Not Taken
SPORT 0149-3	Dirt Pile.	Soil	-	26 Aug 96 1035	R. Adkins	Not Taken
SPORT 0152-1	Between tanks 3 & 4, west end.	Soil	7'	26 Aug 96 1350	R. Adkins	Not Taken
SPORT 0152-2	Between tanks 3 &4, east end.	Soil	7'	26 Aug 96 1350	R. Adkins	Not Taken
SPORT 0152-3	North side of UST NH46-4.	Soil	7'	26 Aug 96 1350	R. Adkins	Not Taken
SPORT 0152-4	Between tanks 2 & 3.	Soil	7'	26 Aug 96 1350	R. Adkins	Not Taken

* = Depth Below the Surrounding Land Surface

X. SAMPLING METHODOLOGY

Provide a detailed description of the methods used to collect and store (preserve) the samples.

After the removal of USTs NH46-1, NH46-2, NH46-3, and NH46-4 soil samples were taken. Sampling was performed in accordance with SC DHEC R.61-92 Part 280 and SC DHEC UST Assessment Guidelines.

The samples are identified as follows:

	Detachment Charleston		General Engineering Labs
Soil Sample	UST NH46-1-1	=	SPORT -0149-1
Soil Sample	UST NH46-1-2	=	SPORT -0149-2
Soil Sample	UST NH46-1-3	=	SPORT -0149-3
Soil Sample	UST NH46-4	=	SPORT -0152-1
Soil Sample	UST NH46-5	=	SPORT -0152-2
Soil Sample	UST NH46-6	=	SPORT -0152-3
Soil Sample	UST NH46-7	=	SPORT -0152-4

Sample jars were prepared by the testing laboratory. The soil samples were all grab samples. The volatile samples were immediately sealed in the sample containers leaving as little head space as possible. The semi-volatiles (PAHs) were each individually mixed/homogenized prior to being sealed in their sample containers.

The chain-of-custody sheet for samples SPORT-0152-1 through SPORT-0152-2 was labeled that the PAH samples were composite samples. This is an error. All samples were grab samples. The field technician confused the mixing of the semi-volatiles with taking a composite sample and incorrectly entered the note on the chain-of-custody.

The samples were marked, logged, and immediately placed in sample coolers packed with ice to maintain an approximate temperature of 4° C. Tools were thoroughly cleaned and decontaminated with organic-free soap and water after each sample.

The samples remained in the custody of SPORTENVDETCHASN until they were transferred to General Engineering Laboratories for analysis as documented in the attached Chain-of-Custody Record.

XI. RECEPTORS

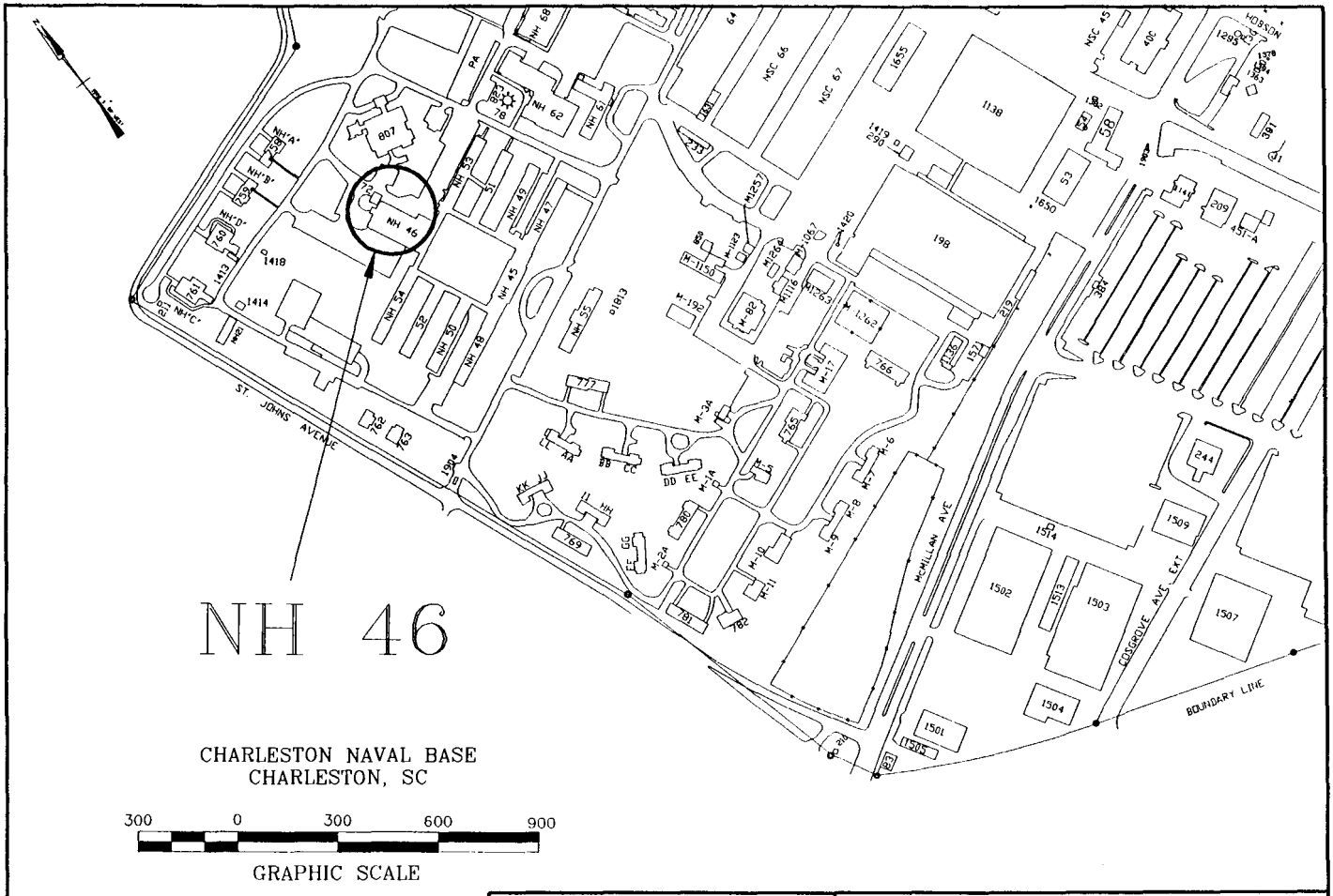
		Yes	No
A.	Are there any lakes, ponds, streams, or wetlands located within 1000 feet of the UST system? If yes, indicate type of receptor, distance, and direction on site map.		X
B.	Are there any public, private, or irrigation water supply wells within 1000 feet of the UST system? If yes, indicate type of well, distance, and direction on site map.		X
C.	Are there any underground structures (e.g., basements) located within 100 feet of the UST system? If yes, indicate the type of structure, distance, and direction on site map.		X
D.	Are there any underground utilities (e.g., telephone, electricity, gas, water, sewer, storm drain) located within 100 feet of the UST system that could potentially come in contact with the contamination? [*Storm drain] If yes, indicate the type of utility, distance, and direction on the site map.	*X	
E.	Has contaminated soil been identified at a depth of less than 3 feet below land surface in an area that is not capped by asphalt or concrete? If yes, indicate the area of contaminated soil on the site map.		X

Attachment I

SITE MAP

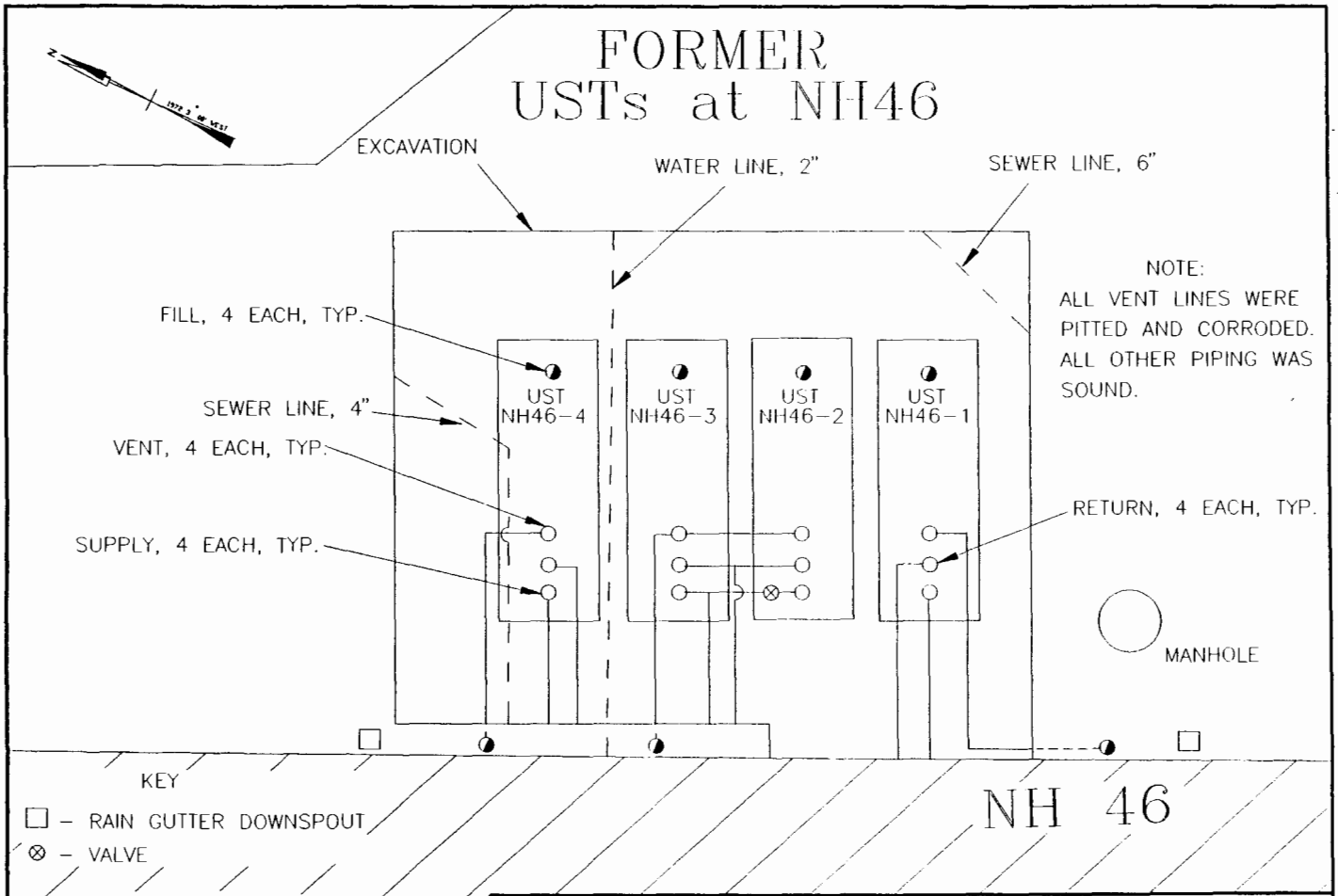
You must supply a scaled site map. It should include all buildings, road names, utilities, tank and pump island locations, sample locations, extent of excavation, and any other pertinent information.

Site Maps 1 through 4
Photographs 1 through 7



Site Map 1 UST NH 46 Charleston Naval Base Charleston, SC	SPORTENVDETCHASN 1899 North Hobson Avenue North Charleston, SC 29405-2106
	DWG DATE: 27 Nov 1996 | DWG NAME: NH46_1

FORMER USTs at NH46



NOTE:
ALL VENT LINES WERE PITTED AND CORRODED. ALL OTHER PIPING WAS SOUND.

KEY

□ – RAIN GUTTER DOWNSPOUT

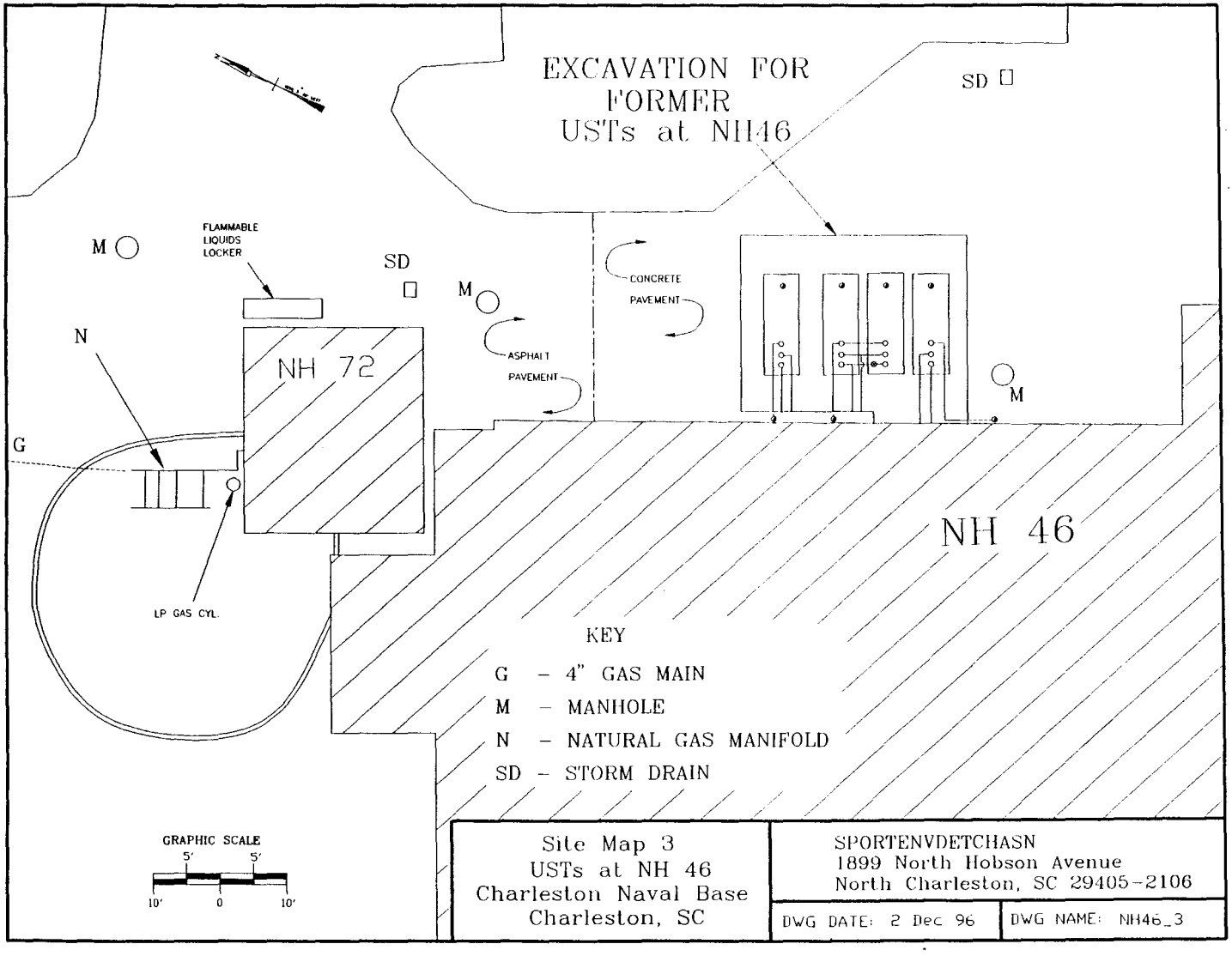
⊗ – VALVE

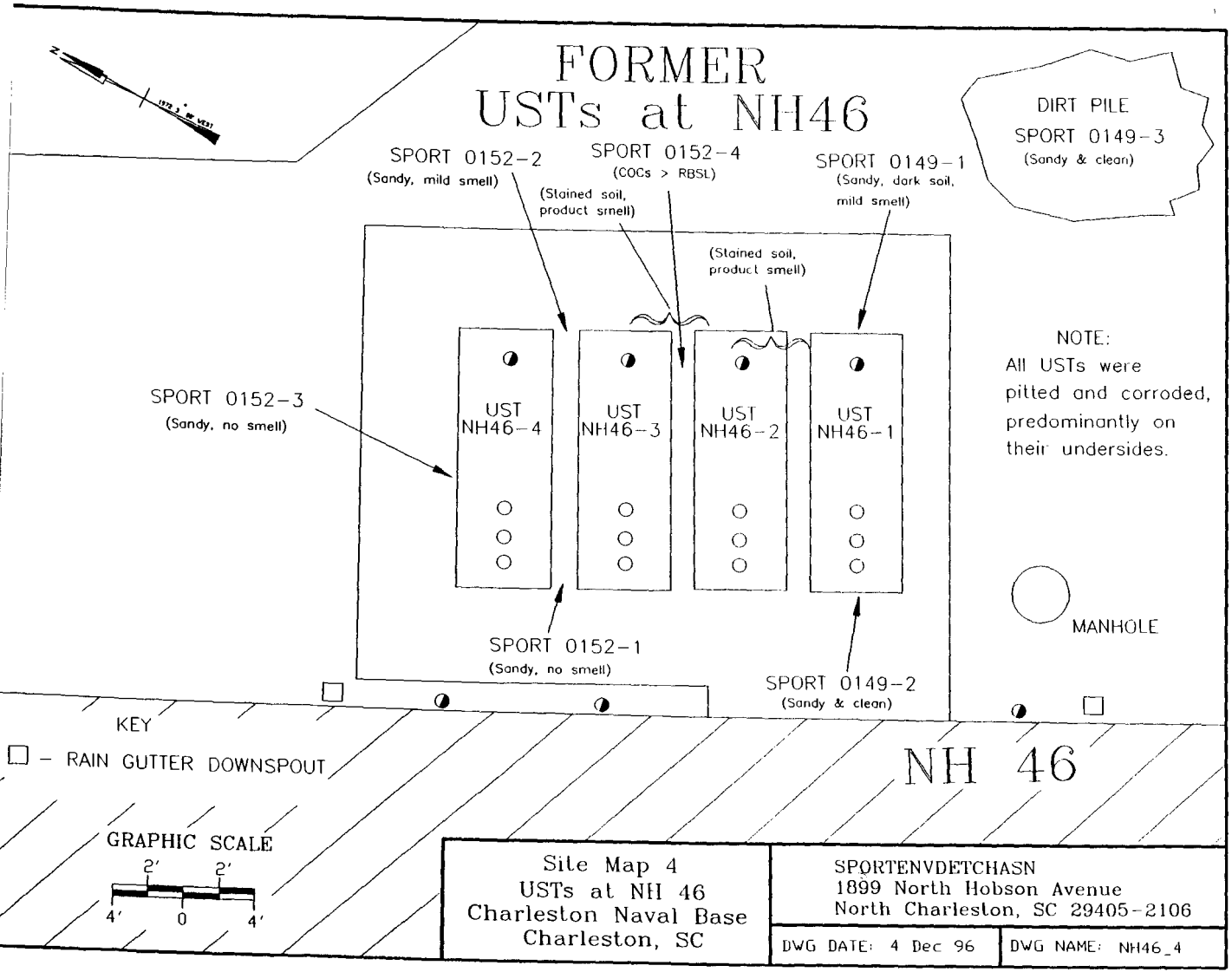
GRAPHIC SCALE

2' 2'

4' 0 4'

Site Map 2 USTs at NH 46 Charleston Naval Base Charleston, SC	SPORTENVDETCHASN 1899 North Hobson Avenue North Charleston, SC 29405-2106
	DWG DATE: 3 Dec 96 / DWG NAME: NH46_2


EXCAVATION FOR
FORMER
USTs at NH46
SD
M
FLAMMABLE
LIQUIDS
LOCKER
SD
M
CONCRETE
PAVEMENT
N
NH 72
ASPHALT
PAVEMENT
M
G
NH 46
LP GAS CYL.
KEY
G - 4" GAS MAIN
M - MANHOLE
N - NATURAL GAS MANIFOLD
SD - STORM DRAIN
GRAPHIC SCALE
5' 5'
10' 0 10'
Site Map 3
USTs at NH 46
Charleston Naval Base
Charleston, SC
SPORTENVDETCHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106
DWG DATE: 2 Dec 96
DWG NAME: NH46_3


FORMER
USTs at NH46
DIRT PILE
SPORT 0149-3
(Sandy & clean)
SPORT 0152-2
(Sandy, mild smell)
SPORT 0152-4
(COCs > RBSL)
(Stained soil, product smell)
SPORT 0149-1
(Sandy, dark soil, mild smell)
(Stained soil, product smell)
SPORT 0152-3
(Sandy, no smell)
UST NH46-4
UST NH46-3
UST NH46-2
UST NH46-1
NOTE:
All USTs were pitted and corroded, predominantly on their undersides.
MANHOLE
SPORT 0152-1
(Sandy, no smell)
SPORT 0149-2
(Sandy & clean)
KEY
- RAIN GUTTER DOWNSPOUT
NH 46
GRAPHIC SCALE
2' 2'
4' 0 4'
Site Map 4
USTs at NH 46
Charleston Naval Base
Charleston, SC
SPORTENVDETCHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106
DWG DATE: 4 Dec 96
DWG NAME: NH46_4

USTs at NH46

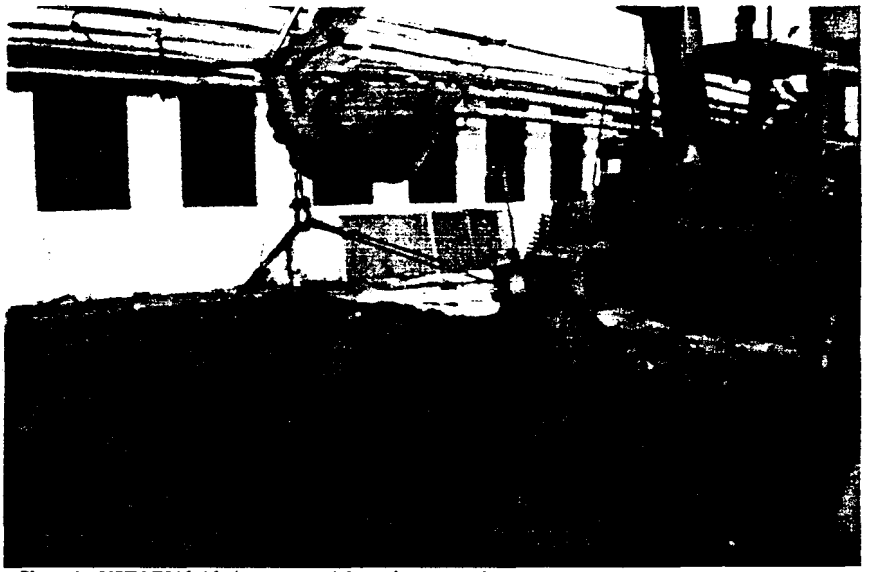


Photo 1: UST NH46-4 being removed from the excavation.

Photo 2: UST NH46-4 during cleaning and dissection.

USTs at NH46

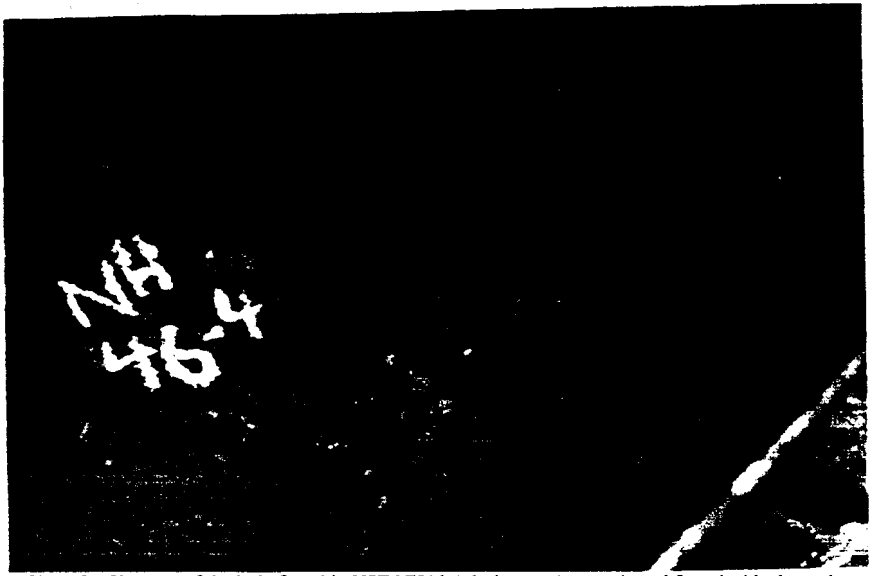


Photo 3: Close up of the hole found in UST NH46-4 during cutting as viewed from inside the tank.

Photo 4: Close up of the hole found in UST NH46-2.

USTs at NH46

Photo 5: Close up of the two holes found in NH46-1.

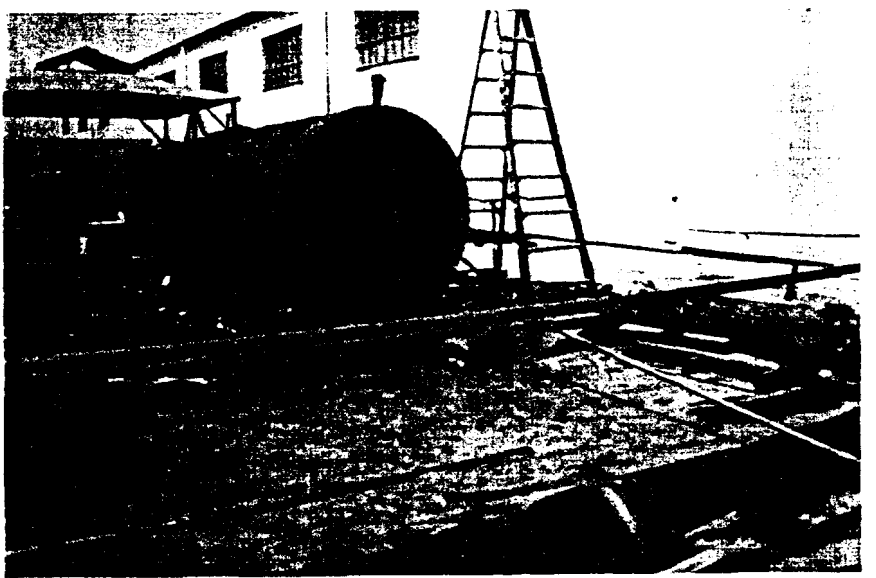


Photo 6: UST 46-1 during cleaning and dissection.

USTs at NH46

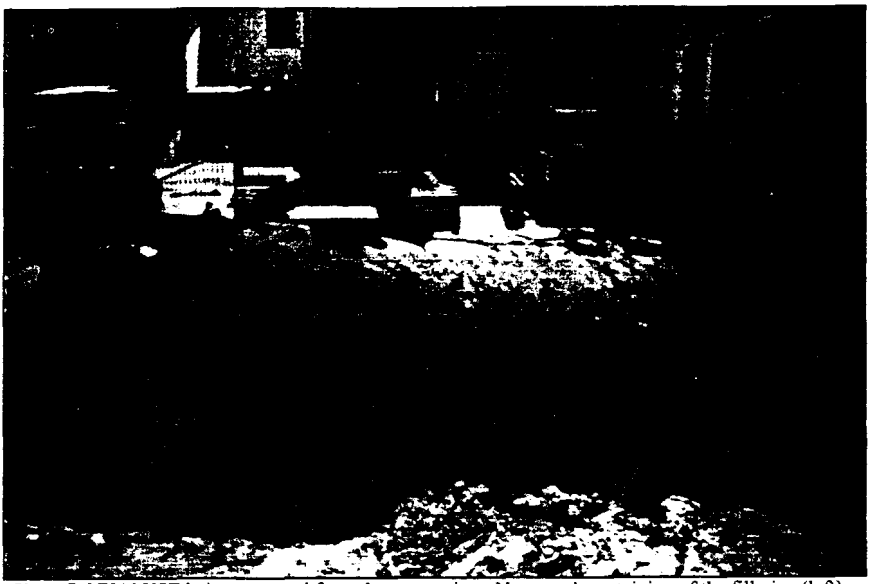


Photo 7: NH46 UST being removed from the excavation. Note product staining of the fill pipe (left) end due to over filling.

Attachment II

ANALYTICAL RESULTS

You must submit the laboratory report and chain-of-custody form for the samples. These samples must be analyzed by a South Carolina certified laboratory.

Certified Analytical Results
Chain-of-Custody

NH46

GENERAL ENGINEERING LABORATORIES

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CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: August 27, 1996

Sample ID	: SPORT0149-1
Lab ID	: 9608464-01
Matrix	: Soil
Date Collected	: 08/22/96
Date Received	: 08/22/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	50.0	100	ug/kg	50.	THL	08/25/96	2102	89427	1
Ethylbenzene	U	0.00	50.0	100	ug/kg	50.					
Toluene	U	0.00	50.0	100	ug/kg	50.					
Xylenes (TOTAL)	U	0.00	50.0	100	ug/kg	50.					
Naphthalene	U	0.00	50.0	100	ug/kg	50.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	1670	3330	ug/kg	10.	BDG	08/25/96	0038	89408	2
Acenaphthylene	U	0.00	1670	3330	ug/kg	10.					
Anthracene	U	0.00	1670	3330	ug/kg	10.					
Benzo(a)anthracene	U	0.00	1670	3330	ug/kg	10.					
Benzo(a)pyrene	U	0.00	1670	3330	ug/kg	10.					
Benzo(b)fluoranthene	U	0.00	1670	3330	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	1670	3330	ug/kg	10.					
Benzo(k)fluoranthene	U	0.00	1670	3330	ug/kg	10.					
Chrysene	U	0.00	1670	3330	ug/kg	10.					
Dibenzo(a,h)anthracene	U	0.00	1670	3330	ug/kg	10.					
Fluoranthene	U	0.00	1670	3330	ug/kg	10.					
Fluorene	U	0.00	1670	3330	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	1670	3330	ug/kg	10.					
Naphthalene	U	0.00	1670	3330	ug/kg	10.					
Phenanthrene	U	0.00	1670	3330	ug/kg	10.					
Pyrene	U	0.00	1670	3330	ug/kg	10.					

The following prep procedures were performed:
GC/MS Base/Neutral Compounds TNF 08/24/96 1200 89408 3

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CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hicks

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: August 27, 1996

Sample ID : SPORT0149-1

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Volatile Organics due to a high concentration of hydrocarbons. A dilution was required for Extractable Organics due to matrix interference.

As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610	0.00*	(30.0 - 115.)
Nitrobenzene-d5	M610	0.00*	(23.0 - 120.)
p-Terphenyl-d14	M610	0.00*	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	112.	(59.7 - 159.)
Dibromofluoromethane	BTEX-8260	101.	(74.0 - 128.)
Toluene-d8	BTEX-8260	103.	(53.4 - 163.)
Bromofluorobenzene	NAP-8260	112.	(59.7 - 159.)
Dibromofluoromethane	NAP-8260	101.	(74.0 - 128.)
Toluene-d8	NAP-8260	103.	(53.4 - 163.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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CERTIFICATE OF ANALYSIS

Client:	Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Douchment-Env. 1899 North Hobson Ave. North Charleston, South Carolina 29405-2106
Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

oc: NPWC00196 Report Date: August 27, 1996

Sample ID : SPORT0149-1

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790	WV - 236		

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Analytical Report Specialist

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Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: August 27, 1996

Sample ID	: SPORT0149-2
Lab ID	: 9608464-02
Matrix	: Soil
Date Collected	: 08/22/96
Date Received	: 08/22/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	THL	08/25/96	2130	89427	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	166	331	ug/kg	1.0	BDG	08/25/96	0111	89408	2
Acenaphthylene	U	0.00	166	331	ug/kg	1.0					
Anthracene	U	0.00	166	331	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	166	331	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	166	331	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	166	331	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	166	331	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	166	331	ug/kg	1.0					
Chrysene	U	0.00	166	331	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	166	331	ug/kg	1.0					
Fluoranthene	U	0.00	166	331	ug/kg	1.0					
Fluorene	U	0.00	166	331	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	166	331	ug/kg	1.0					
Naphthalene	U	0.00	166	331	ug/kg	1.0					
Phenanthrene	U	0.00	166	331	ug/kg	1.0					
Pyrene	U	0.00	166	331	ug/kg	1.0					

The following prep procedures were performed:
GC/MS Base/Neutral Compounds TNF 08/24/96 1200 89408 3

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Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Blers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: August 27, 1996

Sample ID : SPORT0149-2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	61.8	(30.0 - 115.)
Nitrobenzene-d5	M610	47.3	(23.0 - 120.)
p-Terphenyl-d14	M610	95.1	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	115.	(59.7 - 159.)
Dibromofluoromethane	BTEX-8260	106.	(74.0 - 128.)
Toluene-d8	BTEX-8260	93.4	(53.4 - 163.)
Bromofluorobenzene	NAP-8260	115.	(59.7 - 159.)
Dibromofluoromethane	NAP-8260	106.	(74.0 - 128.)
Toluene-d8	NAP-8260	93.4	(53.4 - 163.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175

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CERTIFICATE OF ANALYSIS

Client:	Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env. 1899 North Hobson Ave. North Charleston, South Carolina 29405-2106
Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: August 27, 1996

Sample ID : SPORT0149-2

GEL Laboratory Certifications		EPI Laboratory Certifications	
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790	WV - 236		

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney
Analytical Report Specialist

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CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: August 27, 1996

Sample ID	: SPORT0149-3
Lab ID	: 9608464-03
Matrix	: Soil
Date Collected	: 08/22/96
Date Received	: 08/22/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	THL	08/26/96	1101	89427	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	BDG	08/25/96	1506	89408	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds TNF 08/24/96 1200 89408 3

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CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: August 27, 1996

Sample ID : SPORT0149-3

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	49.7	(30.0 - 115.)
Nitrobenzene-d5	M610	32.5	(23.0 - 120.)
p-Terphenyl-d14	M610	93.0	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	120.	(59.7 - 159.)
Dibromofluoromethane	BTEX-8260	112.	(74.0 - 128.)
Toluene-d8	BTEX-8260	106.	(53.4 - 163.)
Bromofluorobenzene	NAP-8260	120.	(59.7 - 159.)
Dibromofluoromethane	NAP-8260	112.	(74.0 - 128.)
Toluene-d8	NAP-8260	106.	(53.4 - 163.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175

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CERTIFICATE OF ANALYSIS

Client:	Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env. 1899 North Hobson Ave. North Charleston, South Carolina 29405-2106
Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: August 27, 1996

Sample ID : SPORT0149-3

GEL Laboratory Certifications		KFI Laboratory Certifications	
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790	WV - 236		

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Analytical Report Specialist

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Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 09, 1996

Sample ID	: SPORT0152-1
Lab ID	: 9608542-01
Matrix	: Soil
Date Collected	: 08/26/96
Date Received	: 08/27/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	50.0	100	ug/kg	50.	MKP	09/01/96	0516	89833	1
Ethylbenzene	U	0.00	50.0	100	ug/kg	50.					
Toluene	U	0.00	50.0	100	ug/kg	50.					
Xylenes (TOTAL)	U	0.00	50.0	100	ug/kg	50.					
Naphthalene	U	0.00	50.0	100	ug/kg	50.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	166	332	ug/kg	1.0	JCB	09/04/96	1801	89979	2
Acenaphthylene	U	0.00	166	332	ug/kg	1.0					
Anthracene	U	0.00	166	332	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	166	332	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	166	332	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	166	332	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Chrysene	U	0.00	166	332	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	166	332	ug/kg	1.0					
Fluoranthene	U	0.00	166	332	ug/kg	1.0					
Fluorene	U	0.00	166	332	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	166	332	ug/kg	1.0					
Naphthalene	U	0.00	166	332	ug/kg	1.0					
Phenanthrene	U	0.00	166	332	ug/kg	1.0					
Pyrene	U	0.00	166	332	ug/kg	1.0					

The following prep procedures were performed:
GC/MS Base/Neutral Compounds TNF 09/04/96 1000 89979 3

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Client:	Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env. 1899 North Hobson Ave. North Charleston, South Carolina 29405-2106
Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 09, 1996

Sample ID : SPORT0152-1

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Volatile Organics due to matrix interference.
As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	83.9	(30.0 - 115.)
Nitrobenzene-d5	M610	89.3	(23.0 - 120.)
p-Terphenyl-d14	M610	102.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	99.6	(59.7 - 159.)
Dibromofluoromethane	BTEX-8260	80.3	(74.0 - 128.)
Toluene-d8	BTEX-8260	92.8	(53.4 - 163.)
Bromofluorobenzene	NAP-8260	99.6	(59.7 - 159.)
Dibromofluoromethane	NAP-8260	80.3	(74.0 - 128.)
Toluene-d8	NAP-8260	92.8	(53.4 - 163.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

GEL Laboratory Certifications EPI Laboratory Certifications

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Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 09, 1996

Sample ID : SPORT0152-1

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790	WV - 236		

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Analytical Report Specialist

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CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID	: SPORT0152-2
Lab ID	: 9608542-02
Matrix	: Soil
Date Collected	: 08/26/96
Date Received	: 08/27/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	50.0	100	ug/kg	50.	MKP	09/01/96	0548	89833	1
Ethylbenzene	U	0.00	50.0	100	ug/kg	50.					
Toluene	U	0.00	50.0	100	ug/kg	50.					
Xylenes (TOTAL)	U	0.00	50.0	100	ug/kg	50.					
Naphthalene	U	0.00	50.0	100	ug/kg	50.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	1660	3320	ug/kg	10.	JCB	09/04/96	1832	89979	2
Acenaphthylene	U	0.00	1660	3320	ug/kg	10.					
Anthracene	U	0.00	1660	3320	ug/kg	10.					
Benzo(a)anthracene	U	0.00	1660	3320	ug/kg	10.					
Benzo(a)pyrene	U	0.00	1660	3320	ug/kg	10.					
Benzo(b)fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	1660	3320	ug/kg	10.					
Benzo(k)fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Chrysene	U	0.00	1660	3320	ug/kg	10.					
Dibenzo(a,h)anthracene	U	0.00	1660	3320	ug/kg	10.					
Fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Fluorene	U	0.00	1660	3320	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	1660	3320	ug/kg	10.					
Naphthalene	U	0.00	1660	3320	ug/kg	10.					
Phenanthrene	U	0.00	1660	3320	ug/kg	10.					
Pyrene	U	0.00	1660	3320	ug/kg	10.					

The following prep procedures were performed:
GC/MS Base/Neutral Compounds TNF 09/04/96 1000 89979 3

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CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID : SPORT0152-2

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Volatile Organics due to a high concentration of hydrocarbons. A dilution was required for Extractable Organics due to matrix interference.

As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	108.	(30.0 - 115.)
Nitrobenzene-d5	M610	0.00*	(23.0 - 120.)
p-Terphenyl-d14	M610	120.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	87.6	(59.7 - 159.)
Dibromofluoromethane	BTEX-8260	71.2*	(74.0 - 128.)
Toluene-d8	BTEX-8260	80.8	(53.4 - 163.)
Bromofluorobenzene	NAP-8260	87.6	(59.7 - 159.)
Dibromofluoromethane	NAP-8260	71.2*	(74.0 - 128.)
Toluene-d8	NAP-8260	80.8	(53.4 - 163.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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CERTIFICATE OF ANALYSIS

Client:	Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env. 1899 North Hobson Ave. North Charleston, South Carolina 29405-2106
Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID : SPORT0152-2

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790	WV - 236		

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Analytical Report Specialist

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Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID	: SPORT0152-3
Lab ID	: 9608542-03
Matrix	: Soil
Date Collected	: 08/26/96
Date Received	: 08/27/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	50.0	100	ug/kg	50.	MKP	09/01/96	0619	89833	1
Ethylbenzene	U	0.00	50.0	100	ug/kg	50.					
Toluene	U	0.00	50.0	100	ug/kg	50.					
Xylenes (TOTAL)	U	0.00	50.0	100	ug/kg	50.					
Naphthalene	U	0.00	50.0	100	ug/kg	50.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	1660	3320	ug/kg	10.	JCB	09/04/96	1903	89979	2
Acenaphthylene	U	0.00	1660	3320	ug/kg	10.					
Anthracene	U	0.00	1660	3320	ug/kg	10.					
Benzo(a)anthracene	U	0.00	1660	3320	ug/kg	10.					
Benzo(a)pyrene	U	0.00	1660	3320	ug/kg	10.					
Benzo(b)fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	1660	3320	ug/kg	10.					
Benzo(k)fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Chrysene	U	0.00	1660	3320	ug/kg	10.					
Dibenzo(a,h)anthracene	U	0.00	1660	3320	ug/kg	10.					
Fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Fluorene	U	0.00	1660	3320	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	1660	3320	ug/kg	10.					
Naphthalene	U	0.00	1660	3320	ug/kg	10.					
Phenanthrene	U	0.00	1660	3320	ug/kg	10.					
Pyrene	U	0.00	1660	3320	ug/kg	10.					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds TNF 09/04/96 1000 89979 3

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CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID : SPORT0152-3

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Volatile Organics due to a high concentration of hydrocarbons. A dilution was required for Extractable Organics due to matrix interference.

As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	0.00*	(30.0 - 115.)
Nitrobenzene-d5	M610	0.00*	(23.0 - 120.)
p-Terphenyl-d14	M610	118.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	101.	(59.7 - 159.)
Dibromofluoromethane	BTEX-8260	89.1	(74.0 - 128.)
Toluene-d8	BTEX-8260	96.5	(53.4 - 163.)
Bromofluorobenzene	NAP-8260	101.	(59.7 - 159.)
Dibromofluoromethane	NAP-8260	89.1	(74.0 - 128.)
Toluene-d8	NAP-8260	96.5	(53.4 - 163.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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SEP.-09.'96(MON) 12:51 GEN. ENGINEERING TEL:803-852-5812 P.009

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client:	Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env. 1899 North Hobson Ave. North Charleston, South Carolina 29405-2106
Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID : SPORT0152-3

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790	WV - 235		

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Analytical Report Specialist

P O Box 30712 • Charleston, SC 29417 • (803) 556-8171 • Fax (803) 766-1178

SEP.-09'96(MON) 12:51 GEN.ENGINEERING TEL:803-852-5812 P.010

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID	: SPORT0152-4
Lab ID	: 9608542-04
Matrix	: Soil
Date Collected	: 08/26/96
Date Received	: 08/27/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	50.0	100	ug/kg	50.	MKP	09/01/96	0651	89833	1
Ethylbenzene	U	0.00	50.0	100	ug/kg	50.					
Toluene	U	0.00	50.0	100	ug/kg	50.					
Xylenes (TOTAL)	U	0.00	50.0	100	ug/kg	50.					
Naphthalene	U	0.00	50.0	100	ug/kg	50.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	2490	4980	ug/kg	10.	JCB	09/04/96	1935	89979	2
Acenaphthylene	U	0.00	2490	4980	ug/kg	10.					
Anthracene	U	0.00	2490	4980	ug/kg	10.					
Benzo(a)anthracene	U	0.00	2490	4980	ug/kg	10.					
Benzo(a)pyrene	U	0.00	2490	4980	ug/kg	10.					
Benzo(b)fluoranthene	U	0.00	2490	4980	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	2490	4980	ug/kg	10.					
Benzo(k)fluoranthene	U	0.00	2490	4980	ug/kg	10.					
Chrysene	U	0.00	2490	4980	ug/kg	10.					
Dibenzo(a,h)anthracene	U	0.00	2490	4980	ug/kg	10.					
Fluoranthene	U	0.00	2490	4980	ug/kg	10.					
Fluorene		5380	2490	4980	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	2490	4980	ug/kg	10.					
Naphthalene	J	4230	2490	4980	ug/kg	10.					
Phenanthrene	J	3540	2490	4980	ug/kg	10.					
Pyrene	U	0.00	2490	4980	ug/kg	10.					

The following prep procedures were performed:
GC/MS Base/Neutral Compounds

TNF 09/04/96 1000 89979 3

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CERTIFICATE OF ANALYSIS

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID : SPORT0152-4

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Volatile Organics due to a high concentration of hydrocarbons. A dilution was required for Extractable Organics due to matrix interference.

As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	0.00*	(30.0 - 115.)
Nitrobenzene-d5	M610	150.*	(23.0 - 120.)
p-Terphenyl-d14	M610	0.00*	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	100.	(59.7 - 159.)
Dibromofluoromethane	BTEX-8260	85.4	(74.0 - 128.)
Toluene-d8	BTEX-8260	97.0	(53.4 - 163.)
Bromofluorobenzene	NAP-8260	100.	(59.7 - 159.)
Dibromofluoromethane	NAP-8260	85.4	(74.0 - 128.)
Toluene-d8	NAP-8260	97.0	(53.4 - 163.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client:	Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env. 1899 North Hobson Ave. North Charleston, South Carolina 29405-2106
Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: September 06, 1996

Sample ID : SPORT0152-4

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790	WV - 236		

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Analytical Report Specialist

P O Box 30712 • Charleston, SC 29417 • (803) 556-8171 • Fax (803) 766-1178

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NPWL 00196

KBB

CHAIN OF CUSTODY RECORD

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Carolina 29414
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Page 1 of 1 96008464

Client Name/Facility Name: SPORTENYDETCHASN

Collected by/Company: RADKINS SPORTENYDETCHASN

Use F or P in the boxes to indicate whether sample was filtered and/or preserved: CCL 22896

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractable	BN Extractable	PCB's	Cyanide	Coliform - specify type	GT MATPH	PAH	Remarks	
-01 SPORT 0149-1	8/22/96	1035		X		X	2																X	X	UST NH46-1-1 SOIL	.1
-02 SPORT 0149-2	8/22/96	1035		X		X	2																X	X	UST NH46-1-2 SOIL	.1
-03 SPORT 0149-3	8/22/96	1035		X		X	2																X	X	UST NH46-1-3 SOIL	.1
-04 SPORT 0149-4	8/22/96	1035				X	3																X		UST NH46-1 VOA TRIPBLANK	.2

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
Randy Adkins	8/22/96	1110	Jim S. McGrath	W. Kirkpatrick	8/22/96	1455	Catherine Hill
Relinquished by: Karen Blakeney	Date: 8/22/96	Time: 1500	Received by lab by: [illegible]	Date: 8/23/96	Time: 1500	Remarks:	

White = sample collector Yellow = file Pink = with report

NF 100196

BB

CHAIN OF CUSTODY RECORD

2040 Savage Road
Charleston, South Carolin 9414
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Page 1 of 1

9608542

Client Name/Facility Name: SPORTENVDETCHASN

Collected by/Company: SPORTENVDETCHASN

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

CCL 22961

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	BTEX + NAPTHALENE	PAH	Remarks	
-01	SPORTO152-1	8/26/96	1350		X	*	*	2																X	X	NH46-4 soil	-1
-02	SPORTO152-2	8/26/96	1350		X	*	*	2																X	X	NH46-5 soil	-1
-03	SPORTO152-3	8/26/96	1350		X	*	*	2																X	X	NH46-6 soil	-1
-04	SPORTO152-4	8/26/96	1350		X	*	*	2																X	X	NH46-7 soil	1
-05	SPORTO152-5	8/26/96	1300		X		X	~~2~~ 3	WRH															X		NH46 VOA Trip Blank	

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
R E [illegible]	8/26/96	1430	W.R. Hiers, Jr.	W.R. Hiers, Jr.	8/27/96	1500	[illegible]
Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:	
[illegible]	8/27/96	1600	Joseph P [illegible]	8/27/96	1500	BTEX + NAPTHALENE Samples Are GRAB. PAH Samples ARE COMPOSITE	

White = sample collector Yellow = file Pink = with report

Attachment III

Certificate of Disposal (tank)

UST Certificate of Disposal

CONTRACTOR

Supervisor of Shipbuilding, Conversion and Repair, USN
Portsmouth, VA
Environmental Detachment Charleston
1899 North Hobson Avenue
North Charleston 29405-2106

Telephone (803) 743-6482

TANK ID & LOCATION

NH46-1, Building NH 46, Charleston Naval Base, N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning
& Disposal Area
Charleston Naval Complex

TYPE OF TANK	SIZE (GAL)
Fuel Oil	2,500 gal.

CLEANING/DISPOSAL METHOD

The tank was cut open on both ends, cleaned with a steam cleaner, cut into sections, and disposed of as recyclable scrap metal.

DISPOSAL CERTIFICATION

I certify that the above tank has been properly cleaned and disposed of as recyclable scrap metal.

Sidney C. Ladson / 12/2/96
(Name) (Date)

SIDNEY LADSON

UST Certificate of Disposal

CONTRACTOR

Supervisor of Shipbuilding, Conversion and Repair, USN
Portsmouth, VA
Environmental Detachment Charleston
1899 North Hobson Avenue
North Charleston 29405-2106

Telephone (803) 743-6482

TANK ID & LOCATION

NH46-2, Building NH 46, Charleston Naval Base, N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning
& Disposal Area
Charleston Naval Complex

TYPE OF TANK	SIZE (GAL)
Fuel Oil	2,500 gal.

CLEANING/DISPOSAL METHOD

The tank was cut open on both ends, cleaned with a steam cleaner, cut into sections, and disposed of as recyclable scrap metal.

DISPOSAL CERTIFICATION

I certify that the above tank has been properly cleaned and disposed of as recyclable scrap metal.

Sidney C. Ladson 1/12/2/96
(Name) (Date)
Sidney Ladson

UST Certificate of Disposal

CONTRACTOR

Supervisor of Shipbuilding, Conversion and Repair, USN
Portsmouth, VA
Environmental Detachment Charleston
1899 North Hobson Avenue
North Charleston 29405-2106

Telephone (803) 743-6482

TANK ID & LOCATION

NH46-3, Building NH 46, Charleston Naval Base, N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning
& Disposal Area
Charleston Naval Complex

TYPE OF TANK	SIZE (GAL)
Fuel Oil	2,500 gal.

CLEANING/DISPOSAL METHOD

The tank was cut open on both ends, cleaned with a steam cleaner, cut into sections, and disposed of as recyclable scrap metal.

DISPOSAL CERTIFICATION

I certify that the above tank has been properly cleaned and disposed of as recyclable scrap metal.

Sidney C. Ladson 12/2/96
(Name) (Date)

SIDNEY LADSON

UST Certificate of Disposal

CONTRACTOR

Supervisor of Shipbuilding, Conversion and Repair, USN
Portsmouth, VA
Environmental Detachment Charleston
1899 North Hobson Avenue
North Charleston 29405-2106

Telephone (803) 743-6482

TANK ID & LOCATION

NH46-4, Building NH 46, Charleston Naval Base, N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning
& Disposal Area
Charleston Naval Complex

TYPE OF TANK	SIZE (GAL)
Fuel Oil	2,500 gal.

CLEANING/DISPOSAL METHOD

The tank was cut open on both ends, cleaned with a steam cleaner, cut into sections, and disposed of as recyclable scrap metal.

DISPOSAL CERTIFICATION

I certify that the above tank has been properly cleaned and disposed of as recyclable scrap metal.

Sidney C. Hudson 1/12/2/96
Sidney Hudson (Name) (Date)

APPENDIX B

GEOLOGIC BORING LOGS

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: 250/5400
BORING NUMBER: CNC 30-B01
DATE: 5/15/99
GEOLOGIST: Sisco
DRILLER: Coleman

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1				black, grey		asphalt, fill			0			
	2				br		silty sand		slightly moist				
	3												
	4		3.5		dark br								
	5				br		silty sand		moist	2			
	6				light b								
S X	7												
	8		3.5	▼	grey		sand		wet	40			headspace
	9				br				sat				
	10				dark grey					100			
GW X	11				grey					300			
	12		3.5	EOB									

Sample may be collected in sand associated with high G.W. at times.

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Slow to recharge at 11 ft.

Drilling Area Background (ppm): 2

Converted to Well: Yes ____ No X Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: 250/5460

BORING NUMBER: CNC30 - B02
DATE: 5/15/99
GEOLOGIST: Sisco
DRILLER: Coleman

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
		1				black		~~con~~ asphalt, fill			2				
		2				light br		silty sand		moist					
		3													
		4		2											
		5				tan		silty sand		moist	2				headspace
S	X	6				br									
		7													
		8		3		grey		sand		wet	>200				headspace
		9				light br		sand		wet					
		10				grey		sand		sat	>200				headspace
SW	X	11													
		12		4	EOB										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ____ No X Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: ND164 Zone C
DRILLING COMPANY:
DRILLING RIG: 250/54
BORING NUMBER: CNC30-B03
DATE: 5/16/99
GEOLOGIST: Sisco
DRILLER: Coleman

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						asphalt ~~asphalt~~, fill		dry	1			
	2				br		Sandy silt		↓	2			
	3				↓		↓		↓	↓			
	4		1.5		↓		↓		↓	↓			
	5				br		sandy silt		moist	0			
S X	6				light br		silty sand		↓	↓			
	7				br		↓		↓	↓			
	8		3.5		↓		↓		↓	160			headspace
	9			▼	br		silty sand		wet				
	10				grey		sand		sat				strong odor ↓
GW X	11				↓		↓		↓				
	12		3.5	EOB	↓		↓		↓				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 2

Remarks: slow recharge for groundwater

Converted to Well: Yes ____ No X Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: 850/5400

BORING NUMBER: CNC-30-B04
DATE: 5/16/99
GEOLOGIST: Sisco
DRILLER: Coleman

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
	1				black		asphalt, fill		dry	5				
	2				dark br		sandy silt							
	3													
	4		3.5											
	5				br		sandy silt		moist	5				
S X	6				light br					6				headspace
	7													
	8		4	▼	tan		sand		wet	50+				strong odor
	9				br		sandy silt		wet					
	10				light grey		sand		sat					
	11				grey									
	12		4	EOB										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 5

Remarks: slow to recharge

Converted to Well: Yes ____ No X Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: 250/5400

BORING NUMBER: CNC30-B05
DATE: 5/16/99
GEOLOGIST: Sisco
DRILLER: Coleman

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
		1				white		Concrete, fill		dry					
		2				light br		silty sand			3				
		3													
		4		2.5											
		5				light br		fill		dry	3				
		6				orange br		silty sand		moist					4 headspace
S	X	7													
		8		3.5		tan									4 headspace
		9				br		silty sand		wet					
		10													
		11			▼										
GW	X	12		3	EOB	dark grey		sand		sat					strong odor

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 3

Remarks: slow to recharge for groundwater

Converted to Well: Yes ____ No X Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: ND164 Zone C
DRILLING COMPANY:
DRILLING RIG: 250/5400

BORING NUMBER: CNC30-B06
DATE: ~~5/16/99~~ 5/16/99
GEOLOGIST: Sesca
DRILLER: Coleman

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
	1				white		concrete, fill		dry	2				
	2				br		sandy silt							
	3													
	4		3.5						moist	2				
	5				br		silty sand		moist					
	6				light br									
S	X 7													
	8		3.5				sand		wet					2ppm headspace
	9				light b		sand		wet					
	10			▼	grey				sat					
GW	X 11													
	12		4	EOB										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 2

Remarks: slow to recharge for groundwater

Converted to Well: Yes ____ No X Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: 250/5400
BORING NUMBER: CNC30-B07
DATE: 5/16/99
GEOLOGIST: Sisco
DRILLER: Coleman

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						concrete fill		dry				
	2				dark br		sandy ~~silt~~ silt			3			
	3												
	4		2.5							5			
	5				dark br		sandy silt		dry	3			
S X	6				br		backfill		moist				
	7						sandy silt						
	8		4		light br		sand		wet				
	9				br		silty sand ~~sandy silt~~ JMB		wet	3			
	10												
	11						gravel & rock fragments		sat				
	12		3	EOB			sand		sat				

3ppm headspace

3ppm Very stiff headspace

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 3

Remarks: groundwater slow to recharge moderately

Converted to Well: Yes ____ No X Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: 250/5400
BORING NUMBER: CNC 30-B08
DATE: 5/16/99
GEOLOGIST: Sisco
DRILLER: Coleman

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
		1				dark br		sandy silt		dry	3				
		2				br									
		3													
		4		3.5						moist					
		5				light		silty sand		moist	3				
		6				br		sand							
S	X	7													4ppm headspace
		8		4		grey				~~wet~~ slightly moist					
		9				lighter		sand		moist					
		10				br		silty sand		~~wet~~					
		11						sand		wet					strong odor
GW	X	12		4		dark grey		sand		sat					
		13													
		14													
		15				grey		silty sand		moist					
		16		1.5				sand		sat					strong odor
		17						sand		sat					
		18													
		19													
		20		4											strong odor
		21				grey		sand		sat					
		22													
		23													
		24		4											strong odor
		25				grey		sand		sat					

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 3

Remarks: 25-28ft section - density of soil caused liner to crumble in Geo Probe

Converted to Well: Yes ____ No X Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: 250/5400

BORING NUMBER: CNC 30-B08
DATE: 5/16/99
GEOLOGIST: Sisco
DRILLER: Coleman

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	26				Grey		Sand		Sat				
	27				↓		↓		↓				
	28		4	EOB	↓		↓		↓				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: CASE 1370 LOADER W/ 5400

BORING NUMBER: CNC30-B09
DATE: 5-17-99
GEOLOGIST: SIGCO
DRILLER: DAVIS DERUIDER

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0												
	1						Asphalt, fill		Dry				
	2			4 Bo.			Sandy silt some gravel		Dry	4			
	3												
	4		2										
	5				Tan		Sandy silt		Moist	4			
	6				Tan		Silty sand		"	4			
S. X	7				Tan		Silty sand		"	4			
	8		2.5										
	9						Silty sand		Wet				
	10				Gray		Sand		Sat.				
Slu X	11				"		Sand		Sat.				
	12		4		"		Sand		Saturated				
				EOB									

Head Sp. 4

Strong odor

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 3

Converted to Well: Yes ____ No X Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: CASE 1840 w/ 5400

BORING NUMBER: CNC30-B10
DATE: 5-17-99
GEOLOGIST: SISCO
DRILLER: DAVIS DEBUILDER

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0												
	1						Asphalt, Fill		Dry				
	2				Lt. Br.		Sandy Silt		Moist	3			
	3				" "		" "		Moist	3			
	4		3										
	5				Br.		Sandy Silt		Moist	3			
	6				Tan		Silty Sand		Moist	3			
X	7				Tan		Silty Sand		Moist	3			H.S. 3
	8		3										
	9				Tan		Silty Sand		Wet	3			
	10				Gray		Sand		Saturated				Strong Odor
X	11				"		"		"				
	12		4		"		"		"				
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 3

Remarks:

Converted to Well: Yes ____ No X Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46 BORING NUMBER: CNC30-B11
PROJECT NUMBER: N0164 Zone C DATE: 5-17-99
DRILLING COMPANY: GEOLOGIST: Sisco
DRILLING RIG: CME 850 w/ GP. 540 DRILLER: DAVIS DERWIDER

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	
	C														
		1				—		Concrete & fill		Dry					
		2				Tan & Br.		Sandy silt		Moist	3				
		3				Tan & Br.		" "		Moist	3				
		4		2.5						—					
		5				Tan		Silty Sand		Moist	3				
S.	X	6				"		" "		"	3				H.S.
		7				"		" "		"	3				
		8		3.5		Grey Tan		Silty sand		Wet					
		9						Silty sand		Wet					
		10			▼	Grey				Wet					
GW.	X	11				"				Saturated					NO ODOR
		12		4		"				Sat.					
					EOB										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: SLOW TO RECHARGE.

Drilling Area Background (ppm): 3

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: CASE 1840 w/ 54"
BORING NUMBER: CNC30 - B12
DATE: 5-17-99
GEOLOGIST: SISCO
DRILLER: DAVIS DEBUIDED

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		C												
		1						Asphalt & fill		Dry	1			
		2				Lt. Br.		Sandy Silt		Dry	4			
		3				"		" brick chips		"	4			
		4		3.5		"		"		"	4			
		5				Lt. Br		Sandy Silt		Moist	4			
S	X	6				Lt. Br		" "			4			#S.4
		7				Tan		" "			4			
		8		3.5		Gray		" "			4			
		9												
		10				Gray		Sandy silt		Moist	4			
		11				Brown		" "		Wet	10			
		12		3		DK Gray		Sand		Saturated	100+			Strong Odor
X		13												
		14			13.5									
								Push to 13.5 G.W. sample at 9 to 13 ft.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 4

Converted to Well: Yes ____ No X Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: ND164 Zone C
DRILLING COMPANY:
DRILLING RIG: 1890 w/ 540D

BORING NUMBER: CNC30-B13
DATE: 5-17-99
GEOLOGIST: SISCO
DRILLER: D. DERVIDER

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
		0													
		1						Asphalt, fill			✓				
		2				Br.		Sandy silt		Dry	4				
		3				"		"		Dry	4				
		4		3.5		"		"		Dry	4				
		5						Sandy silt		Moist	4				
S	X	6						Silty sand		Moist	4				HS. 5
		7						"		Moist	4				
		8		3.5				Sand		Wet	5				
		9								Wet	✓				
		10			▼	Gray		Sand		Saturated	✓				NO ODOR
		11				↓		"		↓	✓				
SW.	X	12		4				"			✓				
					EOB										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 4

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: CASE 1840 w/ 5400

BORING NUMBER: CNC 30-B14
DATE: 5-17-99
GEOLOGIST: SISCO
DRILLER: D. DERVIDER

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		0												
		1						Asphalt fill		Dry				
		2						Sandy silt		Dry	5			
S.	X	3						" "		Dry	10			
		4		4				Silty sand		Moist	10			
		5						Silty sand		↓	5			
		6						" "		↓	5			
		7						" "		Moist	50			
		8		3.5		Gray		Sand		Wet	100			
		9						"		Wet				
		10						Sand		Wet				
		11						↓		Saturated				
G.W.	X	12		4				↓		Saturated				
					EOB									

PORTA-FID

H.S. 15

Looks like Gw. has been present in the past.

Strong odor

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: * Starting at 7.5 ft.

Drilling Area Background (ppm): 5

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Slow recharge on 8 to 12 sample.

BORING LOG

PROJECT NAME: CNC Site 30 Bldg NH46
PROJECT NUMBER: N0164 Zone C
DRILLING COMPANY:
DRILLING RIG: 1840 / 5400

BORING NUMBER: CNC30-B15
DATE: 5-17-99
GEOLOGIST: SISCO
DRILLER: D. Dercinda

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	
		0													
		1						Asphalt & fill		DRY					
		2				Br		Sandy silt		"	4				
		3				Br.		" "		"	4				(H.S. 4)
S.	X	4		3											
		5				Lt. Br.		Sandy silt		Moist	4				(H.S. 4)
		6				"		Silty sand		Moist	4				
		7				"		" "		Wet	4				
		8		4	▼	Gray		Sand		Wet					
		9						Sand		Saturated					
		10						↓		↓					
G.W.	X	11													
		12		4											
					EOB										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG: Stratigraphic
BORING NUMBER: 30B16
DATE: 6/5/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1												
		2												
		3					Lt. Brn	Silty Sand		Dry	0	0	0	0
0900		4		2/4				↓		↓				
		5												
		6					Lt. Brn.	Silty Sand		Dry				
		7								Moist	0	0	0	0
		8		2.5/4				↓		↓				
0905		9												
		10					Lt. Brown	Silty Sand		Saturated	0	0	0	0
		11						↓		↓				
0910		12		2 3/4			Dr. Gray	↓ Petro. Odor		↓				

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Colum Sie
DRILLING RIG:
BORING NUMBER: 30B17
DATE: 6/5/99
GEOLOGIST:
DRILLER: A. B. and

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler B.Z.	Borehole**	Driller B.Z.**
		1					Blk. w/ Lt.	Asphalt w/base		Dry				
		2												
		3					Lt. Brown	Silty Sand			0	0	0	0
0924		4		2.5/4										
		5												
		6												
		7												
0932		8		0.2/4			Tan	Fine Sand		Dry	0	0	0	0
		9												
		10												
		11												
0937		12		0.5/4			Tan	Fine Sand		Moist	0	0	0	0
		13												
		14					Tan	Silty Sand		Moist	110	0	0	0
		15					Dk. Gray	Petr Odor		Saturated				
0942		16		3/4										

* When rock coring, enter rock brokeness

** Include monitor reading in 8 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes Temp/Piez No Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: ND164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 30B18
DATE: 6/5/99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	1												
	2						Grass		Dry				
	3					Lt. Brn	Silty Sand		Moist				
	4		3/4			DK Brn	Silty Sand		↓				
1004	5					↓	↓		↓				
	6												
	7												
	8		2.9/4			↓	↓		↓				
1007	9								↓				
	10												
	11					DK Brn	Silty Sand		↓				
	12		1.9/4			Brn & Lt	Gravel w/Sand		Saturated				
1012													

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNE Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Colum Sia
DRILLING RIG:
BORING NUMBER: 30B19
DATE: 6/5/99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1												
	2					Wh.	Asphalt w/base		Dry				
	3												
	4					Lt. Brn	Silty Sand						
1026	5		3/4			DK Brn	Silty Sand w/Clay						
	6												
	7					Lt. Brn	Silty Sand		Moist				
	8		4 3/4						Saturated				
1030	9												
	10												
	11												
	12												

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CWC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG:

BORING NUMBER: 30B24
DATE: 6/5/99
GEOLOGIST:
DRILLER: R. Brown

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Grass						
	2				Brn		Silty Sand		Dry				
	3				↓		↓		↓	0	0	0	0
1327	4		2.3/4		↓		↓		↓				
	5												
	6				Brn		↓		Dry				
	7				Lt. Brn		↓		Moist	0	0	0	0
1332	8		2.6/4		↓		↓		↓				
	9				↓		↓		↓				
	10				Dk Gray Blk				Saturated	400	0	0	0
	11						Petro Odor		400				
1337	12		4/4		↓		↓		↓				

* When rock coring, enter rock brokeness

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CWC Site 30
PROJECT NUMBER: ND164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 30B21
DATE: 6/5/99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	1					Brn	Fine Silty Sand		Dry				
	2												
	3									0	0	0	0
1400	4		2.7/4										
1400	5		2.7/4										
	6					Tan	Fine Silty Sand		Moist				
	7									17	0	0	0
1405	8		3.8/4			DK Gray	Fine Silty Sand Petro odor		Saturated				
	9												
	10												
	11												
1409	12		4/4							600	0	30	0

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG:

BORING NUMBER: 30B22
DATE: 6/5/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Drilling BZ**
		1					Gray	Asphalt w/base		Dry				
		2					Brn	Silty Sand		↓	0	0	0	0
		3												
		4		1.5/4										
1440		5					Red	Fine Silty Sand		Dry				
		6					~~Red~~ Tan	Fine Silty Sand		Moist				
		7					~~Red~~	↓		↓	0	0	0	0
X 1444		8		3.2/4			↓	↓		↓				
		9					Lt Brn	Fine Silty Sand		Moist				
		10					↓	↓		↓				
		11								Saturated				
1458		12		4/4			↓	↓		↓				
		13												
		14												
		15												
		16												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes Temp/Perm No Well I.D. #:

BORING LOG

PROJECT NAME: CUC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe

BORING NUMBER: 30B23
DATE: 6/15/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Drillor BZ**
		1					Brn.	Fine Sand		Dry				
		2					Red Brn.	Silty Fine Sand		Dry				
1535		3					↓	↓		Moist	0	0	0	0
		4		3.2/4			↓	↓		↓				
		5					Tan							
		6												
		7												
1540		8		2.9/4			↓	↓		↓				
		9												
		10												
		11								↓				
1545		12		2.2/4			↓	↓		Saturate				
		13												
		14						No Sample Recovered						
		15												
1551		16		0/4										

* When rock coring, enter rock brokeness

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG:
BORING NUMBER: 30B24
DATE: 6/5/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		1						Grass						
		2					Brn.	Fine Silty Sand		Dry				
		3					↓	↓		Moist	0	0	0	0
1421		4		2.5/4										
		5					↓	↓		↓				
		6					DK Brn	Sandy Clay		↓				
X		7					↓	↓		↓	0	0	0	0
1425		8		2.5/4			Bl.	Fine, Coarse Sand & Gravel		Saturated				
		9					↓	↓		↓				
		10												
		11					↓	↓						
1435		12		1/4			DK Gray	Silty Fine Sand		↓				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 30 B25
DATE: 6/5/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Dk Brn	Silty Sand		Dry				
		2					↓	↓ Sandy		Moist				
		3					Gray	Stiff Silty Clay		↓	0	0	0	0
1652		4		4/4			Dk Brn	Silty Sand		↓				
		5		4/4			Gray	Stiff Silty, Sandy, Clay		↓				
X		6					Br.	Clayey Sand		↓				
		7					Gray	Sandy Clay		↓	27	0	0	0
1658		8		2.9/4			Tan	Silty Sand		Saturated				
		9												
		10												
		11												
T.D.		12												
		13												
		14												
		15												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp Piezometer No Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 30B26
DATE: 6/16/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Brown Gray	Fine Sand (6") Sandy Clay (6")		Dry				
		2					Brown	Silty Sand		↓				
		3					Gray	Sandy Clay			0			
1403		4		3.4/4			↓	↓		↓				
		5					Tan	Silty Sand		Moist	0			
	X	6					↓	↓		↓				
		7						—						
		8		2/4				—			0			
1406		9					Tan/Gray	Silty Sand		Moist				
		10					↓	↓		Saturated				
		11								↓				
1408		12		4.0/4			↓	↓		↓				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp. No Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
BORING NUMBER: 30B27
PROJECT NUMBER: ND164 Bldg NH46
DATE: 6/16/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Stratoprobe
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Tan	Silty Sand		Dry				
		2					↓	↓		↓				
		3						—						
		4		2 1/4				—						
1424		5												
	X	6					Tan	Silty Sand		Moist				
		7					↓	↓		↓				
		8		2 1/4			—	—						
1427		9					↓	↓		Saturated				
		10								↓				
		11					↓	↓		↓				
1436		12		2 0/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 30B28
DATE: 6/16/99
GEOLOGIST:
DRILLER: R. Brown

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Brn.	Silty Sand		Dry				
		2					↓	Sandy Clay		↓				
		3					Grey	Silty Clay			16			
1446		4		3.4/4			↓	↓						
		5						—						
	X	6					DK Brn	Silty Sand		Moist	160			
		7					↓	↓		↓				
1449		8		2/4			↓	—						
		9					DK Gray	Sandy Clay		Saturated				
		10					Green	Silty Sand		↓				
		11												
1453		12		1.8/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

PROJECT NAME: CWC Site 30
BORING NUMBER: 30B29
PROJECT NUMBER: N0164 Bldg NH46
DATE: 6/16/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Stratoprobe
DRILLER: A. Brown

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		1					White	Asphalt w/ Gravel		Dry				
		2					Brn	Silty Sand						
		3						—						
		4		2.2/4				—						
1515		5					Tan	Silty Sand		moist				
		6												
		7												
1517		8		4/4										
		9						—						
		10					Tan	Silty Sand		Moist				
		11												
1519		12		2.2/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH66
DRILLING COMPANY: Colorado Sier
DRILLING RIG: Stratoprobe
BORING NUMBER: 30B30
DATE: 6/16/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistancy or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Wht	Asphalt w/ base		Dry				
		2					Brn	Silty Sand		↓				
		3						—						
		4		2/4				—						
1552		5					Tan	Silty Sand		Moist				
		6					↓	↓		↓				
		7					↓	↓		↓	0			
1555	X	8		2.6/4				—						
		9					Blk	Sandy Clay		Saturated				
		10					Gray	↓		↓				
		11					↓	↓		↓				
		12		2.4/4			↓	↓		↓				
1554														

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: (Daycare) Site 30 BORING NUMBER: CNC30 B31
PROJECT NUMBER: N0164 DATE: 7-10-99
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1				fine	br.	sand		dry				
	2								Sl. moist				
	3									0	700	0	0
	4												
	5												
X	6									0			
	7												
	8		4.2			Blk Br							
	9												
	10												
	11												
	12		1/4			Blk	Sand w/ Petro odor & Stain		Saturated				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No ___ Well I.D. #:

BORING LOG

PROJECT NAME: PWC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY:
DRILLING RIG:

BORING NUMBER: CNC30B32
DATE: 7/10/99
GEOLOGIST:
DRILLER: R. Brown

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1			Hand Auger	fine	br.	Sand		dry				
	2						large w/ brick pieces		~~Sl moist~~ dry				
	3												
	4												
	5												
	6									0	0	0	0
	7								Saturated	50	0	200	0
	8		3/4			Blk	Petro odor & stain						
	9												
	10		2/2			Gray	Clay Sand						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: Zone E Site 30
PROJECT NUMBER: N0164 daycare
DRILLING COMPANY: Columbia
DRILLING RIG: Strataprobe

BORING NUMBER: CN<30B33
DATE: 10 7 99
GEOLOGIST:
DRILLER: R Brada

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Drilling BZ**
	1			Hand Auger	fine	br	Sand		dry				
	2								Sl. moist				
	3					gr.	Clay Tan w/ large			46	0	*	0
	4				med.		Pieces Terracotta						
	5					br	Sand		moist	20	0	75	0
*	6												
	7					Gray	Clayey Sand						
	8		2/24						Saturated				
	9												
	10												
	11												
	12		24/4			dk	Sand						

* Met refusal w/ hand auger 3 times at this location

* When rock coring, enter rock brokeness.

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: Zone C Site 30
PROJECT NUMBER: N0164 daycare
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: CNC3034
DATE: 7/9/96
GEOLOGIST: 10
DRILLER: R Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	1				med	tan	sand		Dry				
	2			Hand Auger					Damp				
	3					br.				0	0	0	0
	4					br.							
	5												
X	6												
X	7								moist	0	0		
	8								moist				
	9												
	10												
	11												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No _____ Well I.D. #: _____

BORING LOG

PROJECT NAME: Cue Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Columbia
DRILLING RIG: Strataprobe
BORING NUMBER: 30B35
DATE: 7/1/99
GEOLOGIST: D
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1			Hard		Brn	Fine Silty Sand		Dry				
	2			Auger									
	3									0	0	0	0
	4												
	5								Moist	0			
	6												
	7												
	8		3.0/4			Tan			Saturated				
	9												
	10												
	11												
	12		1.5/4			Gry							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: Zone C Site 30
BORING NUMBER: CNC30B36
PROJECT NUMBER: N0164 Anyscale
DATE: 7 10 95
DRILLING COMPANY: Columbia
GEOLOGIST: D.
DRILLING RIG: Stratapower
DRILLER: R Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1			Hand Auger	Fine Med	Light Br	Sand		Dry				
	2					↓	↓		↓				
	3					tan							
	4					↓	↓		sl moist				
	5									0			
	6								↓				
	7								Saturated				
	8		3"/4			↓	↓		↓				
	9												
	10					↓							
	11					Gray Red	↓						
	12		3"/4				Clayey Sand		↓				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: Zone C Site 30
BORING NUMBER: CNC30B37
PROJECT NUMBER: N0164 Hangar Bldg NH46
DATE: 7/7/99
DRILLING COMPANY: Columbia
GEOLOGIST: 10
DRILLING RIG: Strataprobe
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1				fine	br.	sand		dry				
	2			hand	med				dry				
	3			auger					sl moist				
	4								sl moist				
	5				med				~~sl~~ moist	0	0	0	0
	7					gray			moist				
	8												
	9					orange			wet				
	10						clayey sand						
	11												
	12												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: Chas. Naval Complex
PROJECT NUMBER: N0164 Site 30
DRILLING COMPANY: Custom Drilling
DRILLING RIG: B-61 Mobile
BORING NUMBER: CNC30-MW12D
DATE: 6/19/99
GEOLOGIST: Mark Darrington
DRILLER: Darnell Martin

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	0						No S.S. samples		Strong Petro.	54.2			0.0
	to			8'-10'		Blk	Black - Si Hy sand		odor.	0.0			(w/10 F. Hor.)
	20						V-Mgrain, w-sort						
1	20	4/9	24"	21'		dk gray	Si Hy sand, VF-Fgrn,	SD	no petro. odor.				0.0
	↓	6/11					W. sort, moist-sat.						
	22					Tan-Or-Tn	Si Hy sand-sand, VF-Fgrn, w sort		no petro. odor.	0.6			0.0 (w/10 F. Hor)
2	22	6/6	24"			Tn-	Sand - VF-Fgrn,	SD	no petro. odor.				
	↓	13/14				Or-Tn	W. sorted, moist-						
							sat.			15.3			0.0 (w/10 F. Hor)
	24												
3	24	6/5	18"			Tn-	Sand - VF-Fgrn,	SD		0.2			0.0 (w/10 F. Hor.)
	↓	14/16				Or-Tn	W. sorted, saturated						
	26												
					(X)		Boring Terminated	24'					
							w/3 spoons collected.						
					(1)	2	Drums of soil						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ✓ No _____ Well I.D. #: CNC30-MW12D

BORING LOG

Page ___ of ___

PROJECT NAME: CNC Site 30
PROJECT NUMBER: CNC3 ND164
DRILLING COMPANY: Custom Drilling
DRILLING RIG:

BORING NUMBER: CNC30-MW12D
DATE: 7/2/99
GEOLOGIST: Marty Ray
DRILLER: Custom Drilling / Rod

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1	28	6											
		6											
		6	12										
	30	6											
2	30	6											
		6	12										
		6											
"	32	6											
3	32	6											
		6	12										
		6											
	34	6											
4	34	6											
		6	12										
		6											
	36	6											
5	36	6											
		6	12										
		6											
	38	6											

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

BORING LOG

PROJECT NAME: Chas. Naval Complex
PROJECT NUMBER: N0164 Site 30
DRILLING COMPANY: Custom Drilling
DRILLING RIG: B-61 Mobile / B57 Mobile

BORING NUMBER: CNC30 - MW12D
DATE: 6/19/99 / 7/7/99
GEOLOGIST: Mark Darrington
DRILLER: Darrell Martin / Rod.

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm)			
0	0						No S.S. samples.		Strong Petro.	54.2			0.0
	to			8'-10'		Black	- Silty sand		odor.	(0.0 w/o F. Hor.)			
	20						V-Moist, w-sort						
1	20	4 9	24"	21'		dk gray	Silty sand, VF Fam.,	SD	no petro. odor.				0.0
	↓	6 11					W. sort, moist-sat						
	22				Tan - Or-Tn		Silty sand - sand, VF-Fam, W sort		no petro. odor.	0.0			0.0 (w/o F. Hor)
2	22	6 6	24"		Tn -		Sand - VF - Fam,	SD	no petro. odor.				
	↓	13 19			Or-Tn		W. sorted, moist -						
							sat.			153			0.0 (w/o F. Hor)
	24												
3	24	6 5	18"		Tn -		Sand - VF - Fam,	SD		0.2			0.0 (w/o F. Hor.)
	↓	14 16			Or-Tn		W. sorted, saturated						
	26												
					(X)		Boring Terminated 24'						
							w/3 spoons collected.						
				(X)	7/7/99		Drill out of 6" casing started. Original						
							6" PVC Surface Casing compromised &						
							abandoned.						
						-	New 6" PVC S.C. installed downgradient						
							from original approx. 5-6 ft.						
					(X)		2 Drums of soil						

* When rock coring, enter rock brokeness.

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ✓ No ____ Well I.D. #: CNC30 - MW12D

BORING LOG

Page ___ of ___

PROJECT NAME: CNC Site 30
PROJECT NUMBER: N0164 Bldg NH46
DRILLING COMPANY: Custom Drilling
DRILLING RIG: Mobile B57

BORING NUMBER: CNC30-MW12D (Adj. to MW01)
DATE: 7/8/99
GEOLOGIST: Mark Dannington
DRILLER: Rod Fuller

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length (in)	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistancy or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	20-26			→	See "Boring Log" on 6/19/99 by M. Dannington								
(1)	26	3/9	10/24		Brown	Tan	Sand, VF-F grain, well sorted, Qtz., saturated, friable	SD	No petro. odor or discolor.	2.8	0	0	0
		10/14											
	28												
(2)	28	2/2	24/24		Brown (orange)	Tan	Sand (as above)		No petro. odor or discolor.	2.4	18	18	18
		2/5											
	30												
(3)	30	4/7	18/24		or Tan		Sand (as above) changing @ very bottom to grey sand to		No petro. odor or discolor.	2.0			
		9/8											
	32			32.0	Grey		silty sand, VF-gm.						
(4)	32	7/16	15/24	(*)	Tan sand probably slumped down hole from above					32.0			
		5/9		33	Tan		Sand, VF-F grain, well sorted, Qtz, sat.	SD	No petro. odor.				
	34				Grey		Sand, VF-F, w. sort.	SD	No petro. odor.	1.8			1.8
(5)	35	6/5			Grey		Slightly sandy clay to clay, plastic, cohesive, some shells. 4" shell layer @ 36.5'-36.9', damp to moist.	CL	No petro. odor or discolor.	1.2			1.0
		7/5											
	37												
				(*)	Spooned 26-37' (missing 34-35')								
				(**)	Borehole drilled to 35' bls to set well.								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area (Diesel Motor on R.R.)

Remarks: Installed adj. to & downgrad. of former UST pit. @ 34 ft bls, slumping causing driller to add mud to fluid (@ 1500)

Background (ppm): 1.7

Converted to Well: Yes ✓ No ___ Well I.D. #: CNC30-MW12D

(*) No sample of 34'-35'

BORING LOG

PROJECT NAME: Chas. Naval Complex
PROJECT NUMBER: N0164 Site 30
DRILLING COMPANY: Custom Drilling
DRILLING RIG: B-61 Mobile
BORING NUMBER: CNC30-MW13D
DATE: 6/19/99
GEOLOGIST: Mark Dorrington
DRILLER: Darrell Martin

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	
0	0+						No spl. t spoon (SS)		Silty sand	strong petro. hydro.				
	12'			12			samples collected.		brown to olive gray	odors				29.5 ppm
1	12	9/9	24"			Gn-Bl	clayey sand, F grn, w. sort	CS	petro. odors	109.				(38.6 w/ F. filter)
	13	30/18				Tn	F. grain, w. sort, sand.	SD	no petro odors					
2	14	2/8	24"		Tan		sand, saturated		no petro odors	43.0	7			
	15	12/11		15.5	Or-Tn		sand to silty sand	SD	no petro. odors					
3	16	11/34	18"		Or-Tn		sand, VF grain, w sort	SD	slight petro. odors	17.	1			Driller B.Z.= 0.0
	17	32/34												
4	18	10/19	18"		Tn to		sand, VF-F grain,	SD	faint to no odor.	4.1				Driller B.Z.= 0.6
	19	42/41			Or-Tn		w. sort							
5	20	7/9	18"		Tn to		sand, VF-F grain,		No petro. odors	14.1		3.6		w/ F. filter
	21	16/21			Or-Tn		w. sort		no other odors					
6	22	3/2	24"		Or-Tn		sand, VF-F grn,		No petro. odors	24		0		(2.2 w/ F. filter)
	23	7/15					w. sort							
7	24	13/7	24"		Br to Tn/Br.		sand, VF-F grain,		No petro. odors	24				(2.3 w/ F. filter)
	25	5/13		26'			w. sort							
8	26						MW							
	27													
9	28													
	29													
							To set 6" casing to ~~26'~~ 30'							
							set inner 10ft. beyond. (scrn. 35-40')							
							Borehole Term. @ 24' (HSA)							
							w/ 7 spoons collected.							
							(2) Drums of Soil							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Using FID w/ filter unit

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ✓ No _____ Well I.D. #: CNC30-MW13D

Gy - Gray Bl - Blue BK - Black Yw - Yellow Rd - Red
Gn - Green Br - Brown Or - Orange Tn - Tan

BORING LOG

PROJECT NAME: Chas. Naval Complex
PROJECT NUMBER: N0164 Site 30
DRILLING COMPANY: Custom Drilling
DRILLING RIG: Mobile B57

BORING NUMBER: CNC 30 - MW13D (Adj. to CNC30-MW4)
DATE: 7/8/99
GEOLOGIST: Mark Darrington
DRILLER: Rod Fuller

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	12-25				See	Previous	Boring Log on		6/29/99 by (MWD)				
1	26	6 / 6	8/24	26.0	Tan/Orange		Sand, VF-F grain,	SD	No petro. odors	2.4		0	0
		10 / 13					well sort, Qtz streaks		or discolor.				
							of orange, saturated.						
	28						no shells/fossils, friable						
2	28	10 / 15	24/24		Tan/Or.		Sand - (As above)	SD	No petro. odor	2.3		0	0
		13 / 18							or discolor.				
	30												
3	30	8 / 9	10/24		Tan/Or		Sand (As above)	SD	No petro. odor	2.0		0	0
		9 / 10							or discolor.				
				31.0	Grey/Olive		Sand, VFF grain,	SD	No petro. odor	0.8		0	0
	32						well sort, Qtz, satur.		or discolor.				
4	32	10 / 8	24/24		Grey		Sand, VFF grain,	SD	No petro. odor	0.9		0	0
		9 / 11					well sorted, Qtz,		or discolor.				
							saturated, no shells or						
	34						fossils, friable.						
5	~~34-35~~	5 / 5	21/24		Gray		Clay, Plastic, cohe-	CL	No petro. odors/	1.8		0	0
		7 / 6		35			sive, smooth. some shell		discolor.				
					Gray		Sand w/ abundant	SD	No petro. odor/	1.2		0	0
	37						shell hash, m-c grain,		discolor.				
				37			Poor sorted, saturated,						
							loose, friable.						
				(S)	Sampling		term. @ 37'						
				(B)	Borehole		drilled to 35' ft b/s.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 34-35' not collected, soft sand removed during drilling.

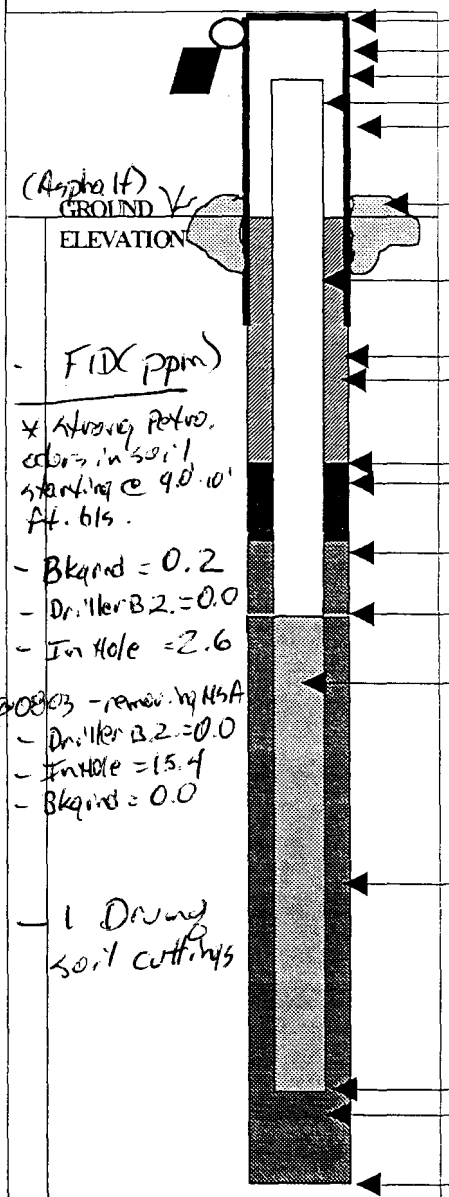
Drilling Area Background (ppm): 0.0

Converted to Well: Yes ✓ No _____ Well I.D. #: CNC30 - MW13D

BORING NO.: CNC30-MW01
(@ former UST pit)

OVERBURDEN MONITORING WELL SHEET

PROJECT Chas. Naval Complex	LOCATION: S. Site 30/Zone C	DRILLER Custom Drilling
PROJECT NO. N0164 Site 30	BORING CNC30-MW01	METHOD: ~~DPT~~ 4.25" HSA
ELEVATION	DATE 6/18/99	DRILLING Darrell Martin
FIELD GEOLOGIST Mark Dannenberg		DEVELOPMENT: NA



- FID (ppm)

x Strong Petro. odors in soil starting @ 9.0-10' ft. bls.

- Bkgrnd = 0.2
- Driller B.Z. = 0.0
- In Hole = 2.6

@08:03 - removing HSA
- Driller B.Z. = 0.0
- In Hole = 15.4
- Bkgrnd = 0.0

— 1 Drum soil cuttings

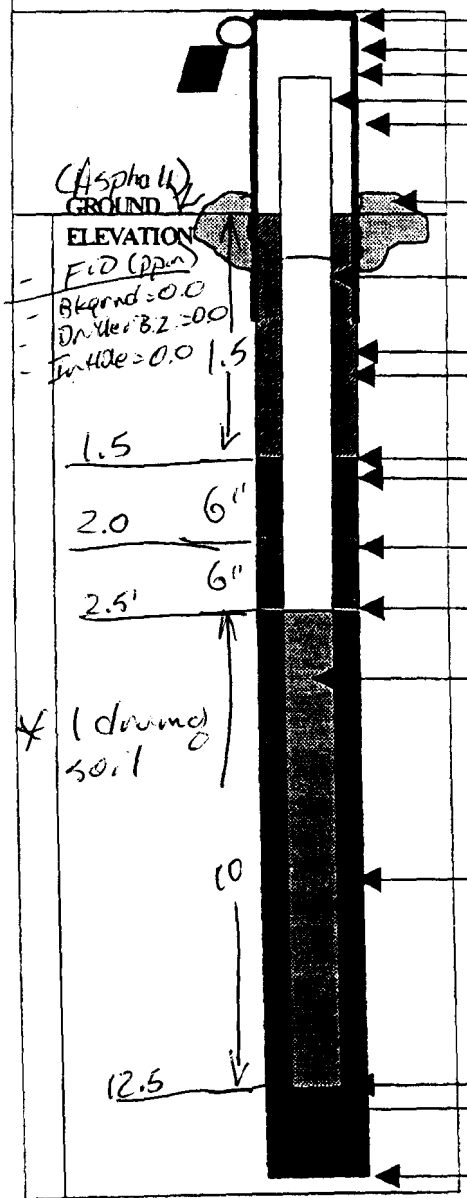
ELEVATION OF TOP OF SURFACE CASING:
ELEVATION OF TOP OF RISER PIPE:
STICK-UP TOP OF SURFACE CASING: Flush
STICK-UP RISER PIPE: Flush
I.D. OF SURFACE CASING: 8" ID x 10" OD
TYPE OF SURFACE CASING: Steel Cover w/ bolt-on lid (flush)
TYPE OF SURFACE SEAL: Concrete Pad (Quick crete) 2 ft. x 2 ft. x 6 in
RISER PIPE I.D.: 2-in.
TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)
BOREHOLE DIAMETER: 8.25-in
TYPE OF SEAL: Portland Cement Type I
ELEVATION / DEPTH OF SEAL: 11.5'
TYPE OS SEAL: "Choke Sand" Very Fine Qtz. Sand (30/65)
DEPTH TOP OF SAND PACK: 2.0'
ELEVATION / DEPTH TOP OF SCREEN: 12.5'
TYPE OF SCREEN: PVC, Sch. 40, F.T.
SLOT SIZE X LENGTH: 0.010-in x 10 ft.
I.D. OF SCREEN: 2-in.
TYPE OF SAND PACK: Standard Sand (Qtz) Qtz. sand (20/30)
ELEVATION / DEPTHBOTTOM OF SCREEN: 112.5
ELEVATION / DEPTH BOTTOM OF SAND PACK: 112.5
TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)
ELEVATION / DEPTH OF HOLE: 112.5

CNC30-MW02

BORING NO. [redacted]

OVERBURDEN MONITORING WELL SHEET

PROJECT Chas. Naval Complex Site30	LOCATION: Site 30/Zone C [redacted]	DRILLER Custom Drilling	
PROJECT NO. [redacted] N0164	BORING [redacted] CNC30	METHOD: ~~DPT~~ 4.25-in HSA	
ELEVATION	DATE 6/17/99 MW02	DRILLING Darrell Martin	
FIELD GEOLOGIST Mark Dennington		DEVELOPMENT: ~~NA~~	



ELEVATION OF TOP OF SURFACE CASING: _____

ELEVATION OF TOP OF RISER PIPE: _____

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush.

I.D. OF SURFACE CASING: 8"10 x 10"OD

TYPE OF SURFACE CASING: Steel cover w/ bolt-on lid (flush)

TYPE OF SURFACE SEAL: Concrete pad (Quickcrete) 2ft. x 2ft. x 6in.

RISER PIPE I.D.: 2-in.

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)

BOREHOLE DIAMETER: 8.25-in.

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 11.5'

TYPE OS SEAL: "Choke Sand" Very Fine Qtz. Sand (30/65)

DEPTH TOP OF SAND PACK: 2.0'

ELEVATION / DEPTH TOP OF SCREEN: 12.5'

TYPE OF SCREEN: PVC, Sch. 40, F.T.

SLOT SIZE X LENGTH: 0.010-in x 10ft.

I.D. OF SCREEN: 2-in.

TYPE OF SAND PACK: Standard Sand. Qtz. Sand (20/30)

ELEVATION / DEPTHBOTTOM OF SCREEN: 112.5

ELEVATION / DEPTH BOTTOM OF SAND PACK: 112.5

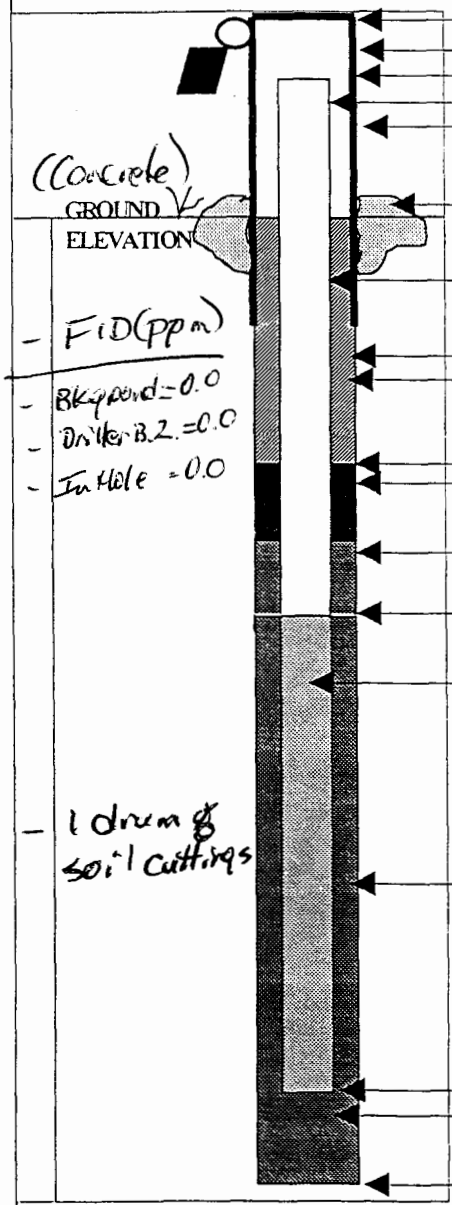
TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)

ELEVATION / DEPTH OF HOLE: 112.5

BORING NO.: CNC30-mw03

OVERBURDEN MONITORING WELL SHEET

PROJECT Chas. Naval Complex	LOCATION: Site 30 Rem.	DRILLER Costan Drilling
PROJECT NO. N0164	BORING CNC30-mw03	METHOD ~~DPT~~ 4.25-in HSA
ELEVATION	DATE 6/18/99	DRILLING Darrell Martin
FIELD GEOLOGIST Mark Durrington		DEVELOPMENT: ~~NA~~



ELEVATION OF TOP OF SURFACE CASING: _____

ELEVATION OF TOP OF RISER PIPE: _____

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8" ID x 10" OD

TYPE OF SURFACE CASING: ~~Com~~ steel w/ bolt-on lid (flush)

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2 ft. x 2 ft. x 6 in

RISER PIPE I.D.: 2-in.

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded

BOREHOLE DIAMETER: 8.25-in

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 12.0'

TYPE OS SEAL: "Choke Sand" Very Fine Qtz. sand (30/65)

DEPTH TOP OF SAND PACK: 4.0'

ELEVATION / DEPTH TOP OF SCREEN: 15.0'

TYPE OF SCREEN: PVC, Sch. 40, F.J.

SLOT SIZE X LENGTH: 0.010-in x 10 ft.

I.D. OF SCREEN: 2-in.

TYPE OF SAND PACK: Standard Sand (Qtz) Qtz. sand (20/30)

ELEVATION / DEPTHBOTTOM OF SCREEN: 115.0'

ELEVATION / DEPTH BOTTOM OF SAND PACK: 115.0'

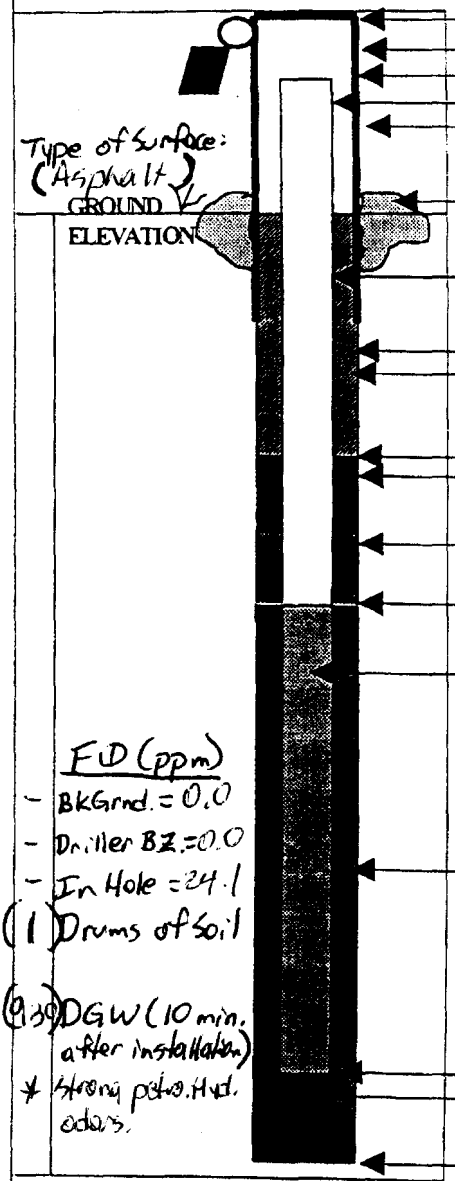
TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)

ELEVATION / DEPTH OF HOLE: 115.0'

BORING NO.: CNC30-mw04

OVERBURDEN MONITORING WELL SHEET

PROJECT Chas. Naval Complex	LOCATION: Site 30/Zone C	DRILLER Custom Drilling
PROJECT NO. N0164	BORING CNC30-mw04	METHOD: ~~DPT~~ HSA 4.25"
ELEVATION	DATE 6/19/99	DRILLING Danny Martin
FIELD GEOLOGIST Mick Donnington		DEVELOPMENT: NA



ELEVATION OF TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8" ID x 10" OD

TYPE OF SURFACE CASING: Steel Cover with Bolt-on Lid (Flush) Pemco

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2 ft. x 2 ft. x 6 in.

RISER PIPE I.D.: 2-in.

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)

BOREHOLE DIAMETER: 8.25-in

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 11.5

TYPE OS SEAL: "Choke Sand" Very Fine Quartz Sand (30/65)

DEPTH TOP OF SAND PACK: 2.5

ELEVATION / DEPTH TOP OF SCREEN: 14.0

TYPE OF SCREEN: PVC, Sch. 40, F.T.

SLOT SIZE X LENGTH: 0.010-in x 10 ft

I.D. OF SCREEN: 2-in

TYPE OF SAND PACK: Standard Sand Quartz Sand (20/30)

ELEVATION / DEPTH BOTTOM OF SCREEN: 114.0

ELEVATION / DEPTH BOTTOM OF SAND PACK: 114.0

TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)

ELEVATION / DEPTH OF HOLE: 114.0

FID (ppm)
- BKGrnd. = 0.0
- Driller BZ = 0.0
- In Hole = 24.1

(1) Drums of Soil

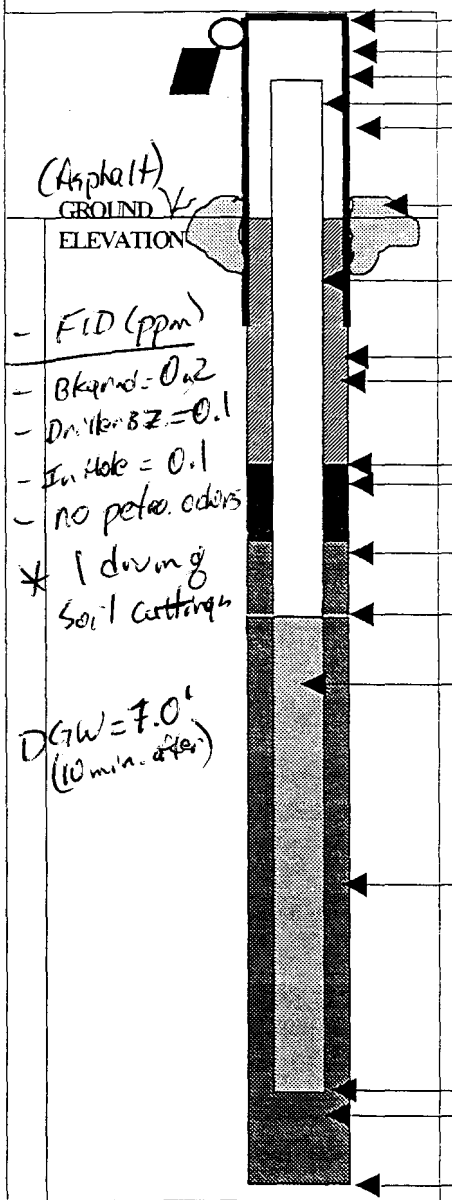
(9.39) DGW (10 min. after installation)

* Strong petro. Hyd. odors.

BORING NO. CNC 30 - MW05

OVERBURDEN MONITORING WELL SHEET

PROJECT Chas Naval Complex	LOCATION: Site 30 / Zone C	DRILLER Custom Drilling
PROJECT NO. N0164	BORING CNC 30 - MW03	METHOD: ~~DPT~~ 4.25 - in HSA
ELEVATION	DATE 6/18/99	DRILLING Darrell Martin
FIELD GEOLOGIST Mark Darrington		DEVELOPMENT: ~~NA~~



ELEVATION OF TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8" ID x 10" OD

TYPE OF SURFACE CASING: Steel Cover w/ Bolt-on lid (Flush)

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2 ft. x 2 ft. x 6 in.

RISER PIPE I.D.: 2-in.

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)

BOREHOLE DIAMETER: 8.25-in

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 11.5

TYPE OS SEAL: "Choke Sand" Very fine Qtz. Sand (30/65)

DEPTH TOP OF SAND PACK: 2.5 2.0

ELEVATION / DEPTH TOP OF SCREEN: 13.0

TYPE OF SCREEN: PVC, Sch. 40, F.T.

SLOT SIZE X LENGTH: 0.010 in x 10 ft.

I.D. OF SCREEN: 2 in.

TYPE OF SAND PACK: Standard Sand Qtz. Sand (20/30)

ELEVATION / DEPTHBOTTOM OF SCREEN: 113.0

ELEVATION / DEPTH BOTTOM OF SAND PACK: 113.0

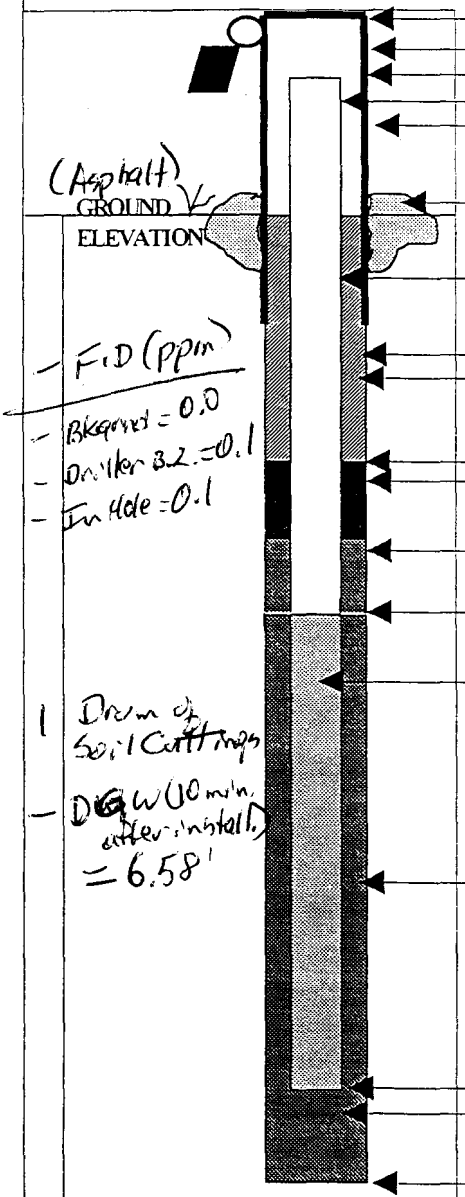
TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)

ELEVATION / DEPTH OF HOLE: 113.0

BORING NO.: CNC 30 -MW06

OVERBURDEN MONITORING WELL SHEET

PROJECT Chas. Naval Complex	LOCATION: Site 30/Zone C	DRILLER Custom Drilling
PROJECT NO. N0164	BORING CNC-30-MW06	METHOD: ~~DPT~~ 4.25" HSA
ELEVATION	DATE 06/18/99	DRILLING Darrell Martin
FIELD GEOLOGIST Mark Dennington		DEVELOPMENT: NA



ELEVATION OF TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8" ID x 10" OD

TYPE OF SURFACE CASING: Steel Cover w/ Bolt-on lid (Flush) Pennco

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2 ft. x 2 ft. 6 in

RISER PIPE I.D.: 2-in

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)

BOREHOLE DIAMETER: 8.25 -in.

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 11.5'

TYPE OS SEAL: "Choke Sand" Very Fine Sand Qtz, (30/65)

DEPTH TOP OF SAND PACK: 2.5'

ELEVATION / DEPTH TOP OF SCREEN: 13.0'

TYPE OF SCREEN: PVC, Sch. 40, F.T.

SLOT SIZE X LENGTH: 0.010 in. x 10 ft.

I.D. OF SCREEN: 2-in

TYPE OF SAND PACK: Standard Sand "Qtz" Qtz sand (20/30)

ELEVATION / DEPTHBOTTOM OF SCREEN: 113.0'

ELEVATION / DEPTH BOTTOM OF SAND PACK: 113.0'

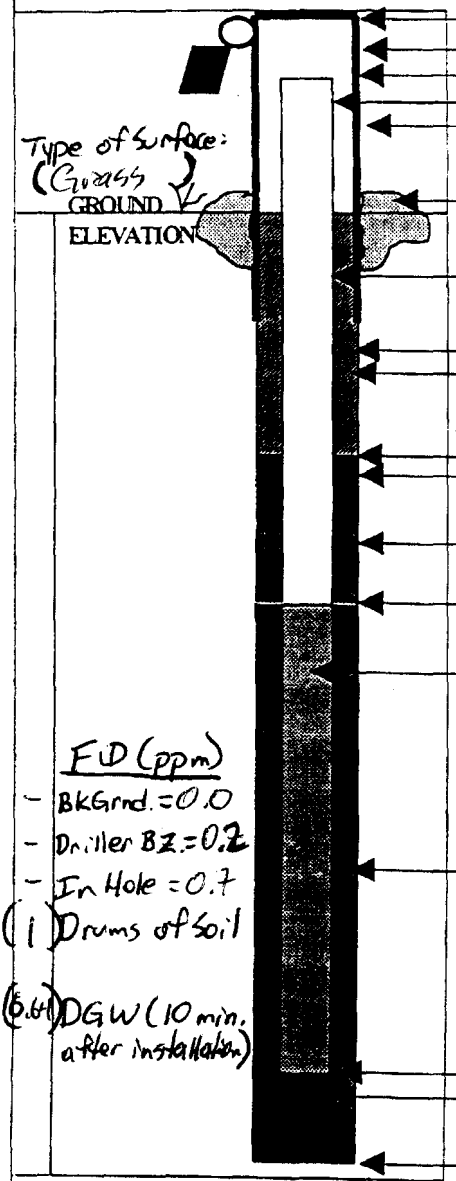
TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)

ELEVATION / DEPTH OF HOLE: 113.0'

BORING NO. CNC-MW07
30

OVERBURDEN MONITORING WELL SHEET

PROJECT	Chas. Naval Complex	LOCATION	Site 30/Zone C	DRILLER	Custom Drilling
PROJECT NO.	N0164	BORING	CNC-30-MW07	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	6/18/99	DRILLING	Darrell Martin
FIELD GEOLOGIST	Mark Dammeyer			DEVELOPMENT:	NA



ELEVATION OF TOP OF SURFACE CASING:
ELEVATION OF TOP OF RISER PIPE:
STICK-UP TOP OF SURFACE CASING: Flush
STICK-UP RISER PIPE: Flush
I.D. OF SURFACE CASING: 8" ID x 10" OD
TYPE OF SURFACE CASING: Steel Cover with Bolt-on Lid (Flush) Pemco
TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2 ft. x 2 ft. x 6 in.
RISER PIPE I.D.: 2-in.
TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)
BOREHOLE DIAMETER: 8.25-in
TYPE OF SEAL: Portland Cement Type I
ELEVATION / DEPTH OF SEAL: 11.5'
TYPE OS SEAL: "Choke Sand" Very Fine Quartz Sand (30/65)
DEPTH TOP OF SAND PACK: 25'
ELEVATION / DEPTH TOP OF SCREEN: 130'
TYPE OF SCREEN: PVC, Sch. 40, F.T.
SLOT SIZE X LENGTH: 0.010-in x 10 ft
I.D. OF SCREEN: 2-in
TYPE OF SAND PACK: Standard Sand Quartz Sand (20/30)
ELEVATION / DEPTHBOTTOM OF SCREEN: 113.0'
ELEVATION / DEPTH BOTTOM OF SAND PACK: 113.0'
TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)
ELEVATION / DEPTH OF HOLE: 113.0'

FID (ppm)
- BkGrnd. = 0.0
- Driller BZ = 0.2
- In Hole = 0.7

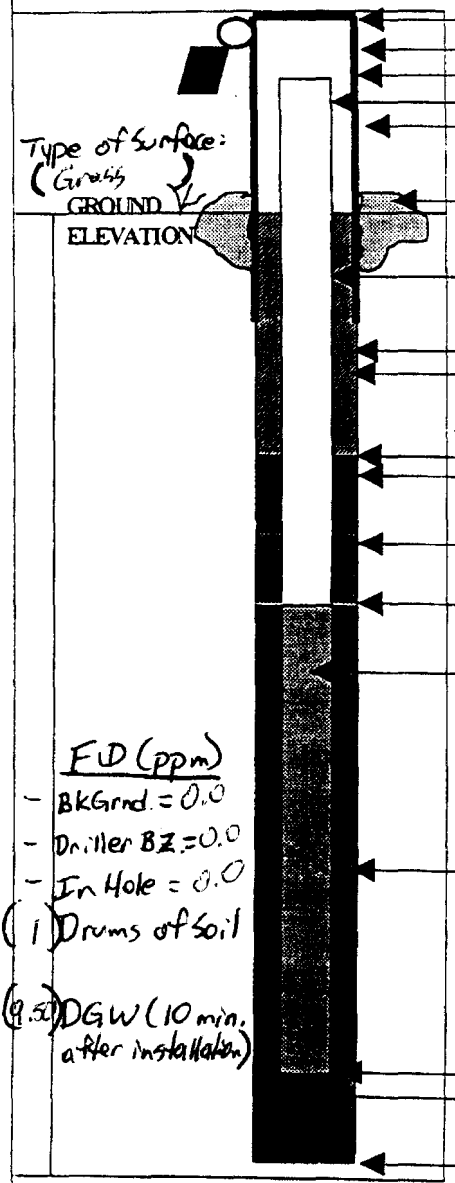
(1) Drums of Soil

(6.4) DGW (10 min. after installation)

BORING NO.: CNC30-mw08

OVERBURDEN MONITORING WELL SHEET

PROJECT	Chas. Naval Complex	LOCATION:	Site 30/Zone C	DRILLER	Custom Drilling
PROJECT NO.	N0164	BORING	CNC30-mw08	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	6/19/99	DRILLING	Darrell Martin
FIELD GEOLOGIST	Mark Durrington			DEVELOPMENT:	NA



ELEVATION OF TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8" ID x 10" OD

TYPE OF SURFACE CASING: Steel Cover with Bolt-on Lid (Flush) Pemco

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2 ft. x 2 ft. x 6 in.

RISER PIPE I.D.: 2-in.

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)

BOREHOLE DIAMETER: 8.25-in

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 12.0'

TYPE OS SEAL: "Choke Sand" Very Fine Quartz Sand (30/65)

DEPTH TOP OF SAND PACK: 3.0'

ELEVATION / DEPTH TOP OF SCREEN: 15'

TYPE OF SCREEN: PVC, Sch. 40, F.T.

SLOT SIZE X LENGTH: 0.010-in x 10 ft

I.D. OF SCREEN: 2-in

TYPE OF SAND PACK: Standard Sand Quartz Sand (20/30)

ELEVATION / DEPTHBOTTOM OF SCREEN: 115'

ELEVATION / DEPTH BOTTOM OF SAND PACK: 115'

TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)

ELEVATION / DEPTH OF HOLE: 115'

FID (ppm)
- BkGrnd. = 0.0
- Driller BZ = 0.0
- In Hole = 0.0

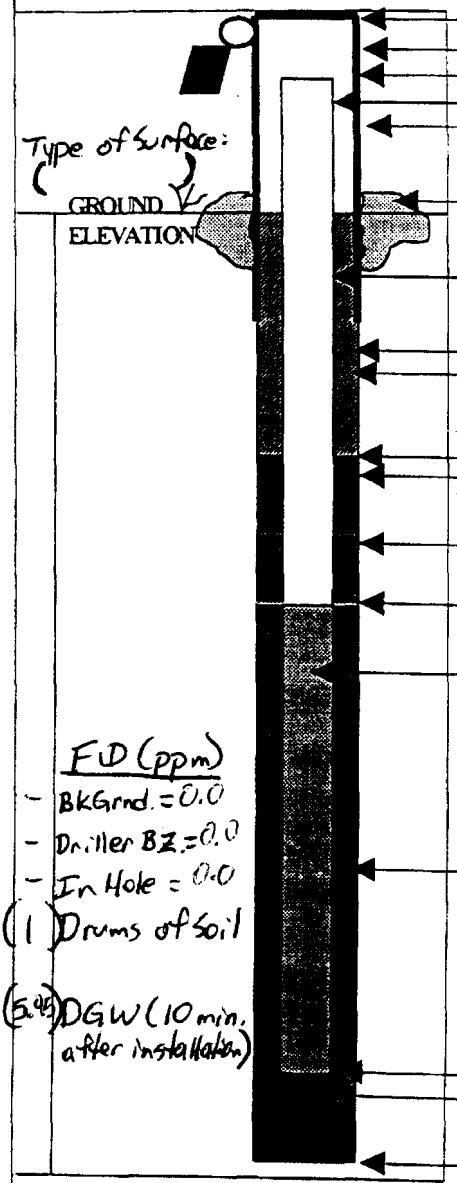
(1) Drums of Soil

(9.5) DGW (10 min. after installation)

BORING NO. CNC30 MW09

OVERBURDEN MONITORING WELL SHEET

PROJECT	Chas. Naval Complex	LOCATION	Site 30/Zone C	DRILLER	Custom Drilling
PROJECT NO.	N0164	BORING	CNC30 - MW09	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	6/19/99	DRILLING	Darrell Marklin
FIELD GEOLOGIST	Mark Davis/Hans			DEVELOPMENT:	~~NA~~



ELEVATION OF TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8" ID x 10" OD

TYPE OF SURFACE CASING: Steel Cover with Bolt-on Lid (Flush) Pemco

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2 ft. x 2 ft. x 6 in.

RISER PIPE I.D.: 2-in.

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)

BOREHOLE DIAMETER: 8.25 - in

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 11.5'

TYPE OS SEAL: "Choke Sand" Very Fine Quartz Sand (30/65)

DEPTH TOP OF SAND PACK: 2.5'

ELEVATION / DEPTH TOP OF SCREEN: 13.0'

TYPE OF SCREEN: PVC, Sch. 40, F.T.

SLOT SIZE X LENGTH: 0.010-in x 10 ft

I.D. OF SCREEN: 2-in

TYPE OF SAND PACK: Standard Sand Quartz Sand (20/30)

ELEVATION / DEPTHBOTTOM OF SCREEN: 113.0

ELEVATION / DEPTH BOTTOM OF SAND PACK: 113.0

TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand (20/30)

ELEVATION / DEPTH OF HOLE: 113.0'

FID (ppm)
- BkGrnd. = 0.0
- Driller BZ = 0.0
- In Hole = 0.0

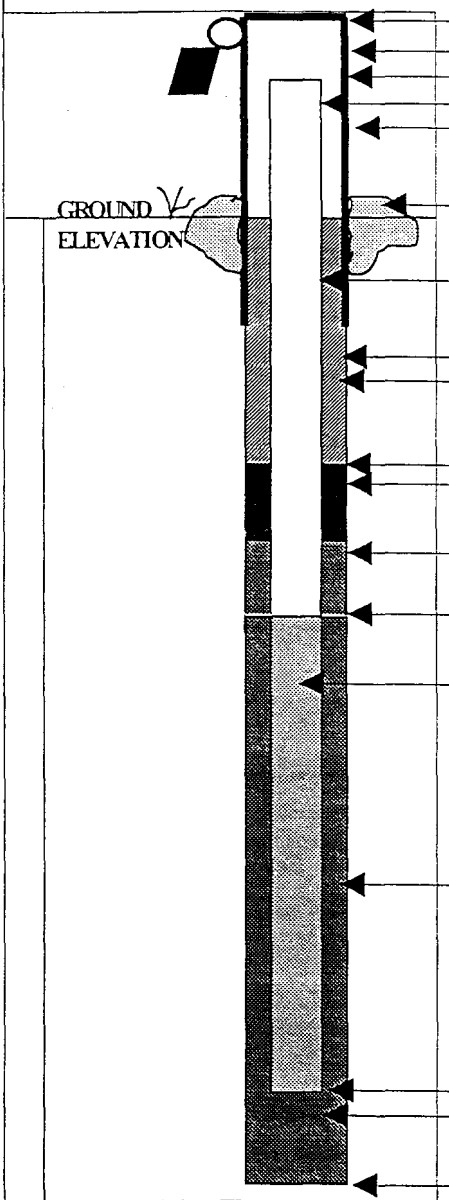
(1) Drums of Soil

(5.49) DGW (10 min. after installation)

BORING NO.: CNC30-MW10

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 30	LOCATION:	CNC30-MW10	DRILLER	Red
PROJECT NO.	CNC30 ND164	BORING	CNC30-MW10	METHOD:	~~BPT~~
ELEVATION		DATE	6/19/99	DRILLING	HSA
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT:	NA



ELEVATION OF TOP OF SURFACE CASING: Flush

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: steel man-hole

TYPE OF SURFACE SEAL: concrete pad 2'x2'x6"

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: ~~30/65 choke sand~~ grout

ELEVATION / DEPTH OF SEAL: 3'0"

TYPE OS SEAL: 30/65 choke sand

DEPTH TOP OF SAND PACK: 5'0"

ELEVATION / DEPTH TOP OF SCREEN: 6'10"

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 16'0"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 16'6

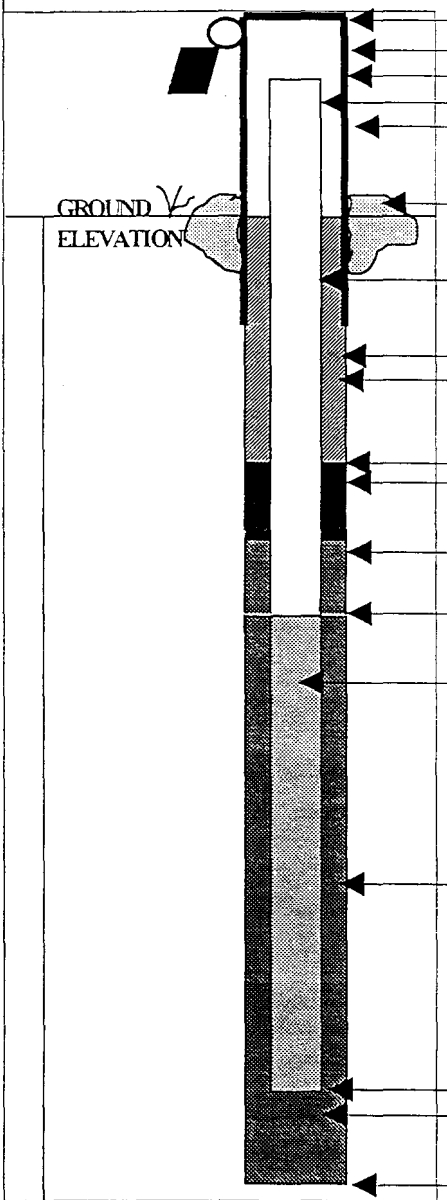
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 sand

ELEVATION / DEPTH OF HOLE: 16'6"

BORING NO. CNC30-MW11

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 30	LOCATION:	CNC30-MW11	DRILLER	Rod
PROJECT NO.	CNC30 N0164	BORING	CNC30-MW11	METHOD: ~~DPT~~	
ELEVATION		DATE	6/19/99	DRILLING	HSA
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT: NA	



ELEVATION OF TOP OF SURFACE CASING: Flush

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: steel man-hole and cover

TYPE OF SURFACE SEAL: concrete Pad 2'x2'x8"

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: grout to 8" bls

ELEVATION / DEPTH OF SEAL: 1'6"

TYPE OS SEAL: 30/65 sand

DEPTH TOP OF SAND PACK: 2'6"

ELEVATION / DEPTH TOP OF SCREEN: 3'0

TYPE OF SCREEN: sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 13'10"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 13'6"

TYPE OF BACKFILL BELOW OBSERVATION WELL:

ELEVATION / DEPTH OF HOLE: 13'6"

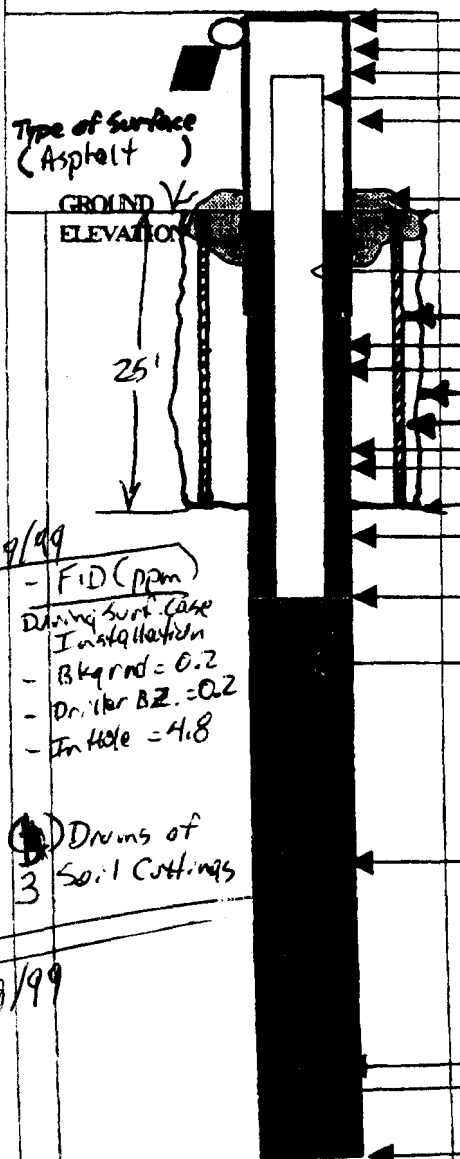
(Telescoped)

OVERBURDEN MONITORING WELL SHEET

BORING NO.: CNC30 - MW12D

PROJECT	Chas. Naval Complex	LOCATION:	CNC30/zone C	DRILLER	Custom Drilling
PROJECT NO.	N0164	BORING	CNC30 - MW12D	METHOD:	[redacted] 8.25 HSA &
ELEVATION		DATE	6/19/99 & 7/8/99	DRILLING	Darrell Martin
FIELD GEOLOGIST	Mark Dennington / M. Dennington			DEVELOPMENT:	[redacted]

Boring Methods: Surface Casing: 8.25" HSA / Inner Casing: 6 in MD



ELEVATION OF TOP OF SURFACE CASING: _____

ELEVATION OF TOP OF RISER PIPE: _____

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8" ID x 10" OD

TYPE OF SURFACE CASING: Steel Cover w/ Bolt on lid / Flush (PEMCO)

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2ft. x 2ft x 6in

RISER PIPE I.D.: (PVC Sch. 40, Flush threaded (F.T.)) 2 in

TYPE OF RISER PIPE:

~~Type of Surface Case (S.C.) PVC Sch. 40 Dia. 6 in.~~

BOREHOLE DIAMETER: 6 in (5 7/8 in roller cone)

TYPE OF SEAL: Portland Cement Type I

~~Borehole Dia. 12.25 in~~ 12.25-in

~~Type of S.C. Seal~~ Portland Cement Type I

ELEVATION / DEPTH OF SEAL: (MW) +24' 23'

TYPE OS SEAL: "Choke sand" (30/65) U/F Sand

~~Depth of Surface Casing~~ 26.0'

DEPTH TOP OF SAND PACK: 28

ELEVATION / DEPTH TOP OF SCREEN: 130

TYPE OF SCREEN: PVC, Sch. 40, F.T.

SLOT SIZE X LENGTH: 0.010 in x 5 ft.

I.D. OF SCREEN: 2 in

TYPE OF SAND PACK: (20/30) Qtz sand (Standard sand)

ELEVATION / DEPTHBOTTOM OF SCREEN: 135'

ELEVATION / DEPTH BOTTOM OF SAND PACK: 135'

TYPE OF BACKFILL BELOW OBSERVATION WELL: (20/30) Sand

ELEVATION / DEPTH OF HOLE: 135'

6/19/99
- FID (ppm) During Surf. Case Installation
- Bkgrnd = 0.2
- Driller BZ. = 0.2
- In Hole = 4.8

(1) Drums of
3 Soil Cuttings

7/8/99

Bkfl qtr 8080 (1981)

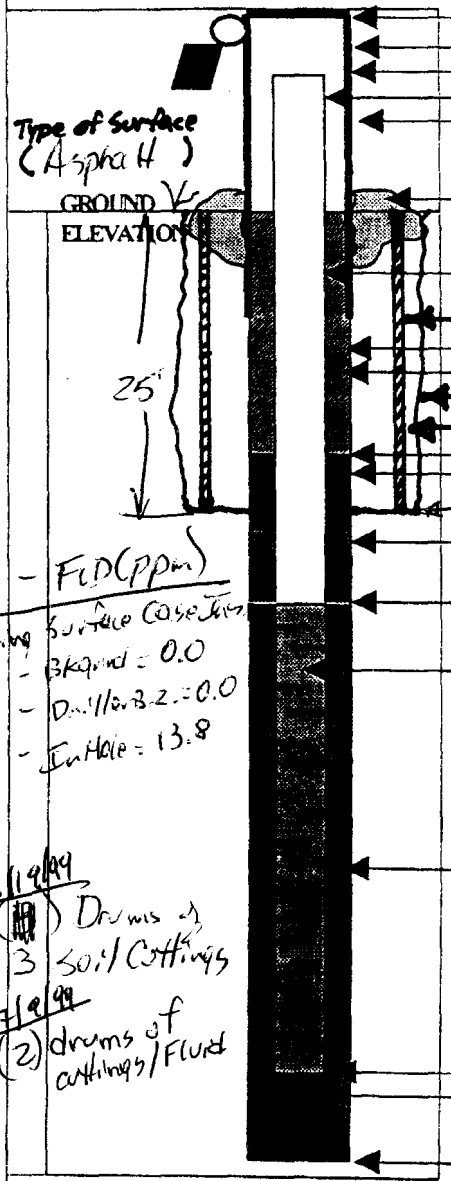
(Telescoped)

BORING NO: CNC30-MW13D

OVERBURDEN MONITORING WELL SHEET

PROJECT Chevs, Natural Complex	LOCATION CNC30/Zone C	DRILLER Custom Drilling
PROJECT NO. NOEL	BORING CNC30-MW13D	METHOD: [redacted] 8.25 HSA
ELEVATION	DATE 6/19/99 & ~~7/19/99~~ 7/8/99	DRILLING Dermoil Marion
FIELD GEOLOGIST Mark Dunington		DEVELOPMENT: [redacted]

Boring Methods: Surface Casing: **Inner Casing** 16" Mud Rotary (only water used)



ELEVATION OF TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING: Flush

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8 in ID x 10 in OD

TYPE OF SURFACE CASING: Steel cover with bolt-on lid (Flush) (PEMCO)

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2 ft x 2 ft x 6 in.

RISER PIPE I.D.: 2-in.

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Thread (F.T.)

Type of Surface Case (S.C.) PVC/Sch. 40 **Dia.** 6"

BOREHOLE DIAMETER: 6 in

TYPE OF SEAL: Portland Cement Type I

Borehole Dia. 12.25 -in

Type of S.C. Seal Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 124'

TYPE OS SEAL: "Choke Sand" (30/65) VF Sand.

Depth of Surf. Case 25'

DEPTH TOP OF SAND PACK: 28

ELEVATION / DEPTH TOP OF SCREEN: 130

TYPE OF SCREEN: PVC, Sch. 40, Flush Thread.

SLOT SIZE X LENGTH: 0.010 in x 5 ft.

I.D. OF SCREEN: 2-in.

TYPE OF SAND PACK: Sand (20/30) Qtz. Sand (Standard Sand®)

ELEVATION / DEPTHBOTTOM OF SCREEN: 135

ELEVATION / DEPTH BOTTOM OF SAND PACK: 135

TYPE OF BACKFILL BELOW OBSERVATION WELL: "Choke Sand" (30/65)

ELEVATION / DEPTH OF HOLE: 137

- FID (ppm)

During Surface Case Jetting

- Background = 0.0
- Drilling Below S.C. = 0.0
- In Hole = 13.8

6/19/99

(1) Drums of 3 Soil Cuttings

7/9/99

(2) drums of cuttings/Fluid

APPENDIX C

FIELD SAMPLING DATA SHEETS

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: CNC Site 30
Project No.: N0164 Bldg NH46
Sampled By:
Field Analyst:
Field Form Checked as per QA/QC Checklist (initials): [illegible]

Sample ID No.: 30GLM0501
Sample Location: CNC30MW5
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

Date: 8 22 99	Color	ORP (Eh)	S.C.	Temp.	Turbidity	DO	Sal.	pH
Time:	(Visual)	(+/- mv)	(mS/cm)	(°C)	(NTU)	(Meter, mg/l)	(%)	(SU)
Method:								

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT CHEMetrics (Range: 0 - 1 mg/L) Analysis Time: 0859

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
	x 0.01	= mg/L
	x 0.02	= mg/L

CHEMetrics: 0.4 mg/L

Notes:

Alkalinity:

Analysis Time: 0850

Equipment: HACH Digital Titrator AL-DT CHEMetrics (Range: _____mg/L) Filtered: ☐

Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titration Count	Multiplier	Concentration
☐	10-40 mg/L	100 ml	0.1600 N	0.1	& 105	x 0.1	= 10.5 mg/L
☐	40-160 mg/L	25 ml	0.1600 N	0.4	&	x 0.4	= mg/L
☐	100-400 mg/L	100 ml	1.600 N	1.0	&	x 1.0	= mg/L
☐	200-800 mg/L	50 ml	1.600 N	2.0	&	x 2.0	= mg/L
☐	500-2000 mg/L	20 ml	1.600 N	5.0	&	x 5.0	= mg/L
☐	1000-4000 mg/L	10 ml	1.600 N	10.0	&	x 10.0	= mg/L

Parameter:	Hydroxide	Carbonate	Bicarbonate
Relationship:	0	0	10.5

CHEMetrics: _____mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:_____ Digits Required: 1st.:_____ 2nd.:_____ 3rd.:_____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: _____mg/L) Analysis Time: 0854

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☒	10-50 mg/L	200 ml	0.3636 N	0.1
☒	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
	x 0.1	= mg/L
168	x 0.2	= 33.6 mg/L
	x 1.0	= mg/L
	x 2.0	= mg/L

CHEMetrics: _____mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:_____ Digits Required: 1st.:_____ 2nd.:_____ 3rd.:_____

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Page __ of __

Project Site Name: CNC Site 30
Project No.: N0164 Bldg N446
Sampled By: JA
Field Analyst: JA
Field Form Checked as per QA/QC Checklist (initials): [illegible]

Sample ID No.: 309LMØ5Ø1
Sample Location: CNC3ØMWØ5
Duplicate: ☐
Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide (S^{2-}):

Equipment: DR-700 DR-8 __ HS-C Color Chart HS-WR Color Wheel Analysis Time: Ø907
Program/Module: 610nm 93 Other: _____
Concentration: Ø.Ø1 mg/L Filtered: ☐
Notes:

Sulfate (SO_4^{2-}):

Equipment: DR-700 DR-8 __ Other: _____ Analysis Time: _____
Program/Module: 91
Concentration: _____ mg/L Filtered: ☐
Standard Solution: ☐ Results: _____
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Nitrite (NO_2^--N):

Analysis Time: Ø94Ø
Equipment: DR-700 DR-8 __ Other: _____ Filtered: ☐
Program/Module: 60
Concentration: Ø.Ø1Ø mg/L Reagent Blank Correction: ☐
Standard Solution: ☐ Results: ☐
Notes:

Nitrate (NO_3^--N):

Analysis Time: _____
Equipment: DR-700 DR-8 __ Other: _____ Filtered: ☐
Program/Module: 55
Concentration: _____ mg/L
Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: CNC Site 30

Project No.: N0164 Bldg NH46

Sampled By:

Field Analyst:

Field Form Checked as per QA/QC Checklist (initials): [illegible]

Sample ID No.:

Sample Location:

Duplicate: ☐

Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Manganese (Mn^{2+}):

Equipment: DR-700 DR-8 __ HACH MN-5 Other: _____ Analysis Time: 0920

Program/Module: 525nm 41

Concentration: 0.0 mg/L

Filtered: ☐

Digestion: ☐

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-700 DR-8 __ IR-18C Color Wheel Other: _____ Analysis Time: 0915

Program/Module: 500nm 33

Concentration: 0.81 mg/L

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S):

Equipment: HS-C Other: _____ Analysis Time: _____

Concentration: 0.0 mg/L Exceeded 5.0 mg/L range on color chart: ☐

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☑

Title block is initialized by person who performed the QA/QC Ckecklist: ☑

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Page __ of __

Project Site Name: CNC Site 30
Project No.: N0164 Bldg NH46
Sampled By:
Field Analyst:
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: 30GLM01Ø1
Sample Location: CNC 30 MW5
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)
Date: 8 22 99								
Time:								
Method:								

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT CHEMetrics (Range: 0-1 mg/L) Analysis Time: 1044

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
	x 0.01	= mg/L
	x 0.02	= mg/L

CHEMetrics: 0.4 mg/L

Notes:

Alkalinity:

Analysis Time: 1035

Equipment: HACH Digital Titrator AL-DT CHEMetrics (Range: _____mg/L) Filtered: ☐

Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titration Count	Multiplier	Concentration
☒	10-40 mg/L	100 ml	0.1600 N	0.1	& 45Ø	x 0.1	= 45 mg/L
☐	40-160 mg/L	25 ml	0.1600 N	0.4	& 12Ø	x 0.4	= 48 mg/L
☐	100-400 mg/L	100 ml	1.600 N	1.0	&	x 1.0	= mg/L
☐	200-800 mg/L	50 ml	1.600 N	2.0	&	x 2.0	= mg/L
☐	500-2000 mg/L	20 ml	1.600 N	5.0	&	x 5.0	= mg/L
☐	1000-4000 mg/L	10 ml	1.600 N	10.0	&	x 10.0	= mg/L

Parameter:	Hydroxide	Carbonate	Bicarbonate
Relationship:	Ø	Ø	48

CHEMetrics: _____mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:_____ Digits Required: 1st.:_____ 2nd.:_____ 3rd.:_____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: _____mg/L) Analysis Time: 1040

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☒	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
	x 0.1	= mg/L
44Ø	x 0.2	= 88 mg/L
	x 1.0	= mg/L
	x 2.0	= mg/L

CHEMetrics: _____mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:_____ Digits Required: 1st.:_____ 2nd.:_____ 3rd.:_____

40 . 2
800

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: CNC Site 30

Sample ID No.: 30GLM0101

Project No.: N0164 Bldg NH46

Sample Location:

Sampled By:

Duplicate: ☐

Field Analyst:

Blank: ☐

Field Form Checked as per QA/QC Checklist (initials): [illegible]

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide (S^{2-}):

Equipment: DR-700 DR-890 HS-C Color Chart HS-WR Color Wheel Analysis Time: 10 ~~11~~ 55 ~~9~~

Program/Module: 610nm 93 Other: _____

Concentration: 0.80 mg/L Filtered: ☐

Notes: "LIMIT" REACHED ON DR890. Sample v. blue after adding reagents.

Sulfate (SO_4^{2-}):

Equipment: DR-700 DR-8__ Other: _____ Analysis Time: _____

Program/Module: 91

Concentration: ——— mg/L Filtered: ☐

Standard Solution: ☐ Results: _____

Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

Notes:

Nitrite (NO_2^--N):

Analysis Time: 1125

Equipment: DR-700 DR-8__ Other: _____ Filtered: ☐

Program/Module: 60

Concentration: 0.003 mg/L Reagent Blank Correction: ☐

Standard Solution: ☐ Results: ☐

Notes:

Nitrate (NO_3^--N):

Analysis Time: _____

Equipment: DR-700 DR-8__ Other: _____ Filtered: ☐

Program/Module: 55

Concentration: ——— mg/L

Nitrite Interference Treatment: ☐

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

Notes:

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: CNC Site 30

Project No.: ND164 Bldg NH46

Sampled By:

Field Analyst:

Field Form Checked as per QA/QC Checklist (initials): [initials]

Sample ID No.: 30SLM01Ø1

Sample Location:

Duplicate: ☐

Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Manganese (Mn^{2+}):

Equipment: DR-700 DR-8__ HACH MN-5 Other: _____ Analysis Time: 11Ø8

Program/Module: 525nm 41

Concentration: Ø.2 mg/L

Filtered: ☐

Digestion: ☐

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-700 DR-8~~9~~Ø IR-18C Color Wheel Other: _____ Analysis Time: 11Ø2

Program/Module: 500nm 33

Concentration: Ø.21 mg/L

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S):

Equipment: HS-C Other: _____ Analysis Time: 1Ø ~~1~~5Ø

Concentration: 5.Ø mg/L Exceeded 5.0 mg/L range on color chart: ☐

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☑

Title block is initialized by person who performed the QA/QC Ckecklist: ☑

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Page __ of __

Project Site Name: CNC Site 29
Project No.: ND164 Bldg NH46
Sampled By:
Field Analyst:
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: 29GLMØ3Ø1
Sample Location: CNC29MWØ3
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color (Visual)	~~ORP (EH)~~ Phase (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)
Date: 7 27 99								
Time:								
Method:		5.80	.061	26.6	Ø	2.61	—	

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT CHEMetrics (Range: 1-1Ø mg/L) Analysis Time: Ø925

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
	x 0.01	= mg/L
	x 0.02	= mg/L

CHEMetrics: 2 mg/L

Notes:

Alkalinity:

Analysis Time:

Equipment: HACH Digital Titrator AL-DT CHEMetrics (Range: _____mg/L) Filtered: ☐

Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titration Count	Multiplier	Concentration
☒	10-40 mg/L	100 ml	0.1600 N	0.1	& 16Ø	x 0.1	= 16 mg/L
☐	40-160 mg/L	25 ml	0.1600 N	0.4	&	x 0.4	= mg/L
☐	100-400 mg/L	100 ml	1.600 N	1.0	&	x 1.0	= mg/L
☐	200-800 mg/L	50 ml	1.600 N	2.0	&	x 2.0	= mg/L
☐	500-2000 mg/L	20 ml	1.600 N	5.0	&	x 5.0	= mg/L
☐	1000-4000 mg/L	10 ml	1.600 N	10.0	&	x 10.0	= mg/L

Parameter:	Hydroxide	Carbonate	Bicarbonate
Relationship:	Ø	Ø	16

CHEMetrics: _____mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:_____ Digits Required: 1st.:_____ 2nd.:_____ 3rd.:_____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: _____mg/L) Analysis Time: Ø942

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
~~☒~~	10-50 mg/L	200 ml	0.3636 N	0.1
☒	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
~~205~~	x 0.1	= ~~205~~ mg/L
205	x 0.2	= 41 mg/L
	x 1.0	= mg/L
	x 2.0	= mg/L

CHEMetrics: _____mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:_____ Digits Required: 1st.:_____ 2nd.:_____ 3rd.:_____

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

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Project Site Name: CNC29

Project No.: N0164

Sampled By:

Field Analyst:

Field Form Checked as per QA/QC Checklist (initials): [initials]

Sample ID No.: 29GFM03Ø1

Sample Location: CNC29MW3

Duplicate: ☐

Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide (S^{2-}):

Equipment: DR-700 DR-8 90 HS-C Color Chart HS-WR Color Wheel Analysis Time: Ø955

Program/Module: 610nm 93 Other: _____

Concentration: Ø.Ø1 mg/L Filtered: ☐

Notes:

Sulfate (SO_4^{2}):

Equipment: DR-700 DR-8 9_ Other: _____ Analysis Time: _____

Program/Module: 91

Concentration: _____ mg/L Filtered: ☐

Standard Solution: ☐ Results: _____

Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

Notes:

Nitrite (NO_2^--N):

Analysis Time: ~~[illegible]~~ 1020

Equipment: DR-700 DR-8 9Ø Other: _____ Filtered: ☐

Program/Module: 60

Concentration: Ø.Ø25 mg/L Reagent Blank Correction: ☐

Standard Solution: ☐ Results: ☐

Notes:

Nitrate (NO_3^--N):

Analysis Time: _____

Equipment: DR-700 DR-8 __ Other: _____ Filtered: ☐

Program/Module: 55

Concentration: _____ mg/L

Nitrite Interference Treatment: ☐

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

Notes:

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

7.27.99

Page __ of __

Project Site Name: CNC Site 29

Project No.: N0164

Sampled By:

Field Analyst:

Field Form Checked as per QA/QC Checklist (initials): [illegible]

Sample ID No.: 29GFM03Ø1

Sample Location: CNC29MW3

Duplicate: ☐

Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Manganese (Mn^{2+}):

Equipment: DR-700 DR-8 __ HACH MN-5 Other: _____ Analysis Time: 1033

Program/Module: 525nm 41

Concentration: 0.2 mg/L

Filtered: ☐

Digestion: ☐

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-700 DR-89Ø IR-18C Color Wheel Other: _____ Analysis Time: 1Ø25

Program/Module: 500nm 33

Concentration: Ø.Ø1 mg/L

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S):

Equipment: HS-C Other: _____ Analysis Time: _____

Concentration: _____ mg/L Exceeded 5.0 mg/L range on color chart: ☐

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☐

Correct measurement units are cited in the SAMPLING DATA block: ☐

Mulitplication is correct for each *Multiplier* table: ☐

Final calulated concentration is within the appropriate *Range Used* block: ☐

Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☐

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☐

Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☐

Title block is initialized by person who performed the QA/QC Ckecklist: ☐

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Site 30 Bldg NH46
Project No.: ND164 Zone C

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 30GLM01 01
Sample Location: CNC30MW01
Sampled By: JA
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 8 22 99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1210	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method:								

PURGE DATA:

Date: 8 22 99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method:	Initial	6.12	.117	29.1	7	0.18		
Monitor Reading (ppm):	1	6.12	.100	29.0	7	0.44		
Well Casing Diameter & Material	2	6.10	.098	29.0	11	0.89		
Type:	3	6.05	.100	28.8	13	0.75		
Total Well Depth (TD): 12.52								
Static Water Level (WL): 9.39								
One Casing Volume(gal/L): .50								
Start Purge (hrs): 1000								
End Purge (hrs): 1030								
Total Purge Time (min): : 30								
Total Vol. Purged (gal/L): 2.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX EDB	HCl	3 x 40ml	
PAH	—	2 x 1 ltr.	
Dissolved Methane	HCl	3 x 40ml	
Anions	—	1 x 1g plastic	

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

874. 4080

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNG 30 Bldg NH46
Project No.: N0164 Zone C

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 30GLM02Ø1
Sample Location: MW-2
Sampled By: JH, RH
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 7-11-99	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Time: 0909								
Method:								

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 7-11-99								
Method: Slow Purge	Initial	5.85	.126	24.3	Ø	1.48		
Monitor Reading (ppm):	1	5.97	.108	24.5	Ø	1.70		
Well Casing Diameter & Material	2	5.97	.106	24.5	Ø	1.42		
Type: P.V.C. 2"	3	5.97	.106	24.5	Ø	1.28		
Total Well Depth (TD):	12.59							
Static Water Level (WL):	10.12							
One Casing Volume(gal/L):	.5gal							
Start Purge (hrs): ~~0809~~	0809							
End Purge (hrs):	0909							
Total Purge Time (min):	1 hr.							
Total Vol. Purged (gal/L).								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
15DEX / MTBE	HCl	3X 40 ml vials	7-11-99
TPH	None	2x 1L Ambers	"

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [illegible]

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Zone C site 3Ø
Project No.: ND164 Zone C Bldg NH46

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 3ØGLMØ3Ø1
Sample Location: CNC3ØMW03
Sampled By: JA
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 8·22·95	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1610	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method:								

PURGE DATA:

Date: 8·22·95	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method:	Initial	5.25	.073	26.2	8	1.97		
Monitor Reading (ppm):	1	4.99	.066	25.9	2	2.Ø0		
Well Casing Diameter & Material	2	4.97	.067	25.9	3	1.91		
Type:	3	4.96	.066	26.1	1	1.90		
Total Well Depth (TD): 14.67								
Static Water Level (WL): 10.40								
One Casing Volume(gal/L): ~~1.67~~	.68							
Start Purge (hrs): 1540								
End Purge (hrs): 1610								
Total Purge Time (min):								
Total Vol. Purged (gal/L): 2.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX/EDB	HCl	3 x 40ml	
PAH	—	2 x 1 ltr.	

OBSERVATIONS / NOTES:

14.67
10.40
4.27

14
4.27
.16
2562
4270
6832

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: CNC 30 Bldg NH46
Project No.: N0164 Zone C

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 30GLM04Ø1
Sample Location: MW-4
Sampled By: RH/EH
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 7-12-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 0902	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: slow purge	red/brown	6.48	.297	24.1	0	2.35		

PURGE DATA:

Date: 7-12-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Slow Purge	Initial	6.35	.341	24.2	16	2.71		
Monitor Reading (ppm):	1	6.44	.301	24.2	6	2.66		
Well Casing Diameter & Material	2	6.45	.307	24.1	Ø	2.37		
Type: P.V.C. 2"	3	6.48	.297	24.1	0	2.35		
Total Well Depth (TD):	13.90							
Static Water Level (WL):	9.38							
One Casing Volume(gal/L):	0.8 gal							
Start Purge (hrs):	0742							
End Purge (hrs):	0902							
Total Purge Time (min):	80							
Total Vol. Purged (gal/L):	28 gal							

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
DRH	—	2x1L AMBER	✓
BTEX/MTBE	HCl	3x40mL	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): James R Hill Eg J. Hamin

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Site 30 Bldg N446
Project No.: N0164 Zone C

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 30GLM05Ø1
Sample Location: CNC 30 MWS
Sampled By: JA
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 8 22 99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1225	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method:								

PURGE DATA:

Date: 8 22 99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method:	Initial	5.Ø2	.191	27.3	115	Ø.79		
Monitor Reading (ppm):	1	5.36	.173	26.4	16	Ø.5Ø		
Well Casing Diameter & Material	2	5.39	.174	26.3	5	Ø.53		
Type:	3	5.39	.17Ø	26.2	3	Ø.36		
Total Well Depth (TD): 13.33								
Static Water Level (WL): 6.8Ø								
One Casing Volume(gal/L): 1.Ø4								
Start Purge (hrs): ØØ8Ø5								
End Purge (hrs): Ø848								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX/EDB	HCl	3 x 40ml	
PAH	—	2 x 1 ltr. amber	
Anions	—		
	—	1 x 1 plastic	
Dissolved Methane			
	HCl	3 x 40ml	

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: CNC 30 Bldg NH46
Project No.: N0164 Zone C

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 30GLM06 01
Sample Location: MW-6
Sampled By: EH / RN
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 7-12-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1451	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method:								

PURGE DATA:

Date: 7-12-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Slow Purge	Initial	5.39	.182	24.5	644	2.45		
Monitor Reading (ppm):	1	6.27	.173	23.5	4	2.07		
Well Casing Diameter & Material	2	6.05	.172	23.6	Ø	2.77		
Type: P.V.C. 2"	3	6.19	.172	23.5	Ø	2.60		
Total Well Depth (TD):	13.30							
Static Water Level (WL):	6.58							
One Casing Volume(gal/L):	1.14 gal							
Start Purge (hrs):	1355							
End Purge (hrs):	1450							
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX, Nap. / MTBE	HCl	3x40ml Vials	
PAH	—	~~2x40ml~~ 2x1L ambers	

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s): James [illegible]

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Zone C Site 30
Project No.: N0164 Zone C

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 30GLM07Ø1
Sample Location: CNC30MW07
Sampled By: JA
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 8 22 99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1515	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method:	Initial	6.58	.368	28.3	48	Ø.78		
Monitor Reading (ppm):	1	6.71	.313	26.Ø	21	Ø.77		
Well Casing Diameter & Material	2	6.68	.295	25.8	4	Ø.42		
Type:	3	6.71	.29Ø	25.8	2/1	0.47		
Total Well Depth (TD): 12.85								
Static Water Level (WL): 6.22								
One Casing Volume(gal/L): 1.06								
Start Purge (hrs): 1415								
End Purge (hrs): 1515								
Total Purge Time (min): 6Ø								
Total Vol. Purged (gal/L): 3.5 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX/EDB	HCl	3 x 40 ml	
PAH	—	2 x 1 ltr.	

OBSERVATIONS / NOTES:

12.85
6.22
6.63

3 1
6.63
11.16
~~39~~ 78
6630
106.08

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: GNOTS Zones C
Project No.: N0164 Bldg NH46

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 30GAM0801
Sample Location: MW-8
Sampled By: EH / R.H.
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 7-10-99	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Time: 1745								
Method:	CLEAR	6.59	.369	22	16	1.52		

PURGE DATA:

Date: 7-10-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Slow Purge	Initial	6.37	.403	28.5°	450	1.98		
Monitor Reading (ppm):	1	6.52	.399	28.2	3	1.66		
Well Casing Diameter & Material	2	6.56	.383	28.2	4	1.64		
Type: PVC / 2"	3	6.59	.369	28.0	16	1.52		
Total Well Depth (TD):	12.81							
Static Water Level (WL):	6.87							
One Casing Volume(gal/L):	.98							
Start Purge (hrs):	1500							
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX/MTBE	HCl	3 x 40 ml Vials	7-10-99
PAH	None	2 x 1 L Amber	"

OBSERVATIONS / NOTES:

Check If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): James O'Kell

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC 30 Bldg NH46
Project No.: N0164 Zone C

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 306LM0901
Sample Location: MW-9
Sampled By: RH/EH
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 7/12/99	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Time:								
Method: low flow								

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 7/12/99								
Method: low flow	Initial	6.84	.194	23.1	6	4.04		
Monitor Reading (ppm):	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Well Casing Diameter & Material	2	6.87	.167	22.5	Ø	3.39		
Type: 2" PVC	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Total Well Depth (TD): 15.36								
Static Water Level (WL): 9.60								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [illegible]

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: [illegible]
Project No.: 0164 Bldg NH46

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 305-M1001
Sample Location: MW-10
Sampled By: EH/RH
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: [illegible]	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Time: [illegible]								
Method:								

PURGE DATA:

Date: [illegible]	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: [illegible]	Initial	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Monitor Reading (ppm): [illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Well Casing Diameter & Material	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Type: PVC [illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Total Well Depth (TD): [illegible]								
Static Water Level (WL): [illegible]								
One Casing Volume(gal/L): [illegible]								
Start Purge (hrs): [illegible]								
End Purge (hrs): [illegible]								
Total Purge Time (min):								
Total Vol. Purged (gal/L): [illegible]								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
[illegible]	[illegible]	3x40 ml	7-10-[illegible]
[illegible]	[illegible]	2x1 L Glass (Amber)	"

OBSERVATIONS / NOTES:

Check if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [illegible]

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC 3 Zone C
Project No.: N0164 Bldg NH49

[] Domestic Well Data
[x] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.:
Sample Location: MW-11
Sampled By: EH/R.N
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Other NA
Date:								
Time:								
Method:								

PURGE DATA:

Date: 7-10-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Slow Purge	Initial	6.52	.435	26.1	37	1.99		
Monitor Reading (ppm):	1							
Well Casing Diameter & Material	2							
Type: 2" PVC	3							
Total Well Depth (TD):	12.97							
Static Water Level (WL):	6.85							
One Casing Volume(gal/L):								
Start Purge (hrs):	1759							
End Purge (hrs):								
Total Purge Time (min):	1012							
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX / MTBE	HCl	3 x 40ml Vials	
TPH	None	2 x 1L amber glass	

OBSERVATIONS / NOTES:

Check if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

7-27-99

Weather: High of 97°F

1555 R. Hill arrived on site to purge & sample MW-12D

1409 Started purging MW-12D W/L=11.30'/10=34.5'/vol.=3.73 gals

	pH	S.C.	Temp	Turbid	DO
Init	8.04	.205	28.4	204	2.55
1st	8.10	.199	28.2	263	2.50
2nd	8.09	.200	26.9	128	2.55
3rd					

Note: MW-12D will be sampled for BTEX, Naph, MTBE, EDB & PAH

1721 Sampled MW-12D #30 GLM1201

1745 Exit Site.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Bldg NH46
Project No.: N0164 Zone C

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 306L71301
Sample Location: MW-13P
Sampled By: RH/EH
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 7/12/99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1006	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: peristaltic-low flow	clear	6.94	0.162	23.5	0	2.84		

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic-low flow	Initial	5.89	0.231	24.6	403	3.56		
Monitor Reading (ppm):	1	6.30	0.184	23.9	0	1.34		
Well Casing Diameter & Material	2	6.85	0.165	23.5	5	2.50		
Type: 2" PVC	3	6.94	0.162	23.5	0	2.84		
Total Well Depth (TD): 34.75'								
Static Water Level (WL): 9.22'								
One Casing Volume(gal/L): 4.2 gal								
Start Purge (hrs): 0745								
End Purge (hrs): 1006								
Total Purge Time (min): 141								
Total Vol. Purged (gal/L): 12.6								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAH	—	2 x 1L AMBER	✓
BTEX / MTBE	HCl	3 x 40mL	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): E. J. Hamm

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Bldg NH46
Project No.: ND164 Zone C

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.:
Sample Location:
Sampled By:
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method:	Initial							
Monitor Reading (ppm):	1							
Well Casing Diameter & Material	2							
Type:	3							
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: CNC30 **Project No.:**
Location: Site 30 **Personnel:** R. Hill, J. Krieger
Weather Conditions: Clear High of 88°F **Measuring Device:** Water Level Meter
Tidally Influenced: Yes ___ No ___ **Remarks:** F.U.

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Readin (feet)*	Thickness of Free Produc (feet)*	Groundwater Elevation (feet)*	Comments
17W-2	9-1-99	0805			10.35			
MW-14		0809			7.28			
MW 12D		0813			11.83			
MW-1		0815			9.62			
MW-3		0817			10.75			
MW-4		0819			9.57			
MW 13D		0821			9.39			
MW-9		0824			9.79			
MW-5		0827			7.20			
MW-6		0829			6.80			
MW-7		0832			6.64			
MW-8		0834			6.11			
MW-11		0841			7.16			
MW 10		0844			7.79			

* All measurements to the nearest 0.01 foot

APPENDIX D

SOIL AND GROUNDWATER LABORATORY ANALYTICAL DATA

Katahdin
ANALYTICAL SERVICES

August 25, 1999

Mr. Paul Calligan
Tetra Tech NUS
1401 Oven Park Drive, Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP-3235
Project ID: CNC Charleston
Project Manager: Ms. Andrea J. Colby
Sample Receipt Date: July 13, 1999

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Confirmation
* Chain of Custody

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Mary S. Morrill
Authorized Signature

8-25-99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on July 13, 1999 and were logged in under Katahdin Analytical Services work order number WP3235 for a hardcopy due date of August 12, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification
WP3235-1	30GLM1401
WP3235-2	30GLM0201
WP3235-3	30GLM0801
WP3235-4	30GLM1101
WP3235-5	30GLM1001
WP3235-6	30GLM0401
WP3236-7	30GLM1301
WP3235-8	30GLM0901
WP3235-9	30GLM0601
WP3235-10	30GLM0601D
WP3235-11	30TL00101

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Eleven aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on July 13, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5972-F instrument. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ug/l.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. A matrix spike/matrix spike duplicate pair was analyzed on sample WP3235-1 (30GLM1401).

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD

for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Method 8260B narrows this 20% maximum to 15%.

In the calibration curve analyzed in this SDG, the average %RSD for all analytes was 14.0%, making the curve acceptable.

Initial analysis of sample WP3235-5 yielded a concentration of the target analyte naphthalene over the upper limit of the calibration curve. Reanalysis occurred at a 1:5 dilution successfully. Both sets of data for this sample are included in the data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Ten aqueous samples were received by Katahdin Analytical Services laboratory on July 13, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the samples occurred following USEPA method 3510 on July 15, 1999. A laboratory control spike consisting of all PAH analytes spiked into organic free water, was extracted in the batch.

The initial calibration curve analyzed in this SDG had some of the target analyte %RSD values exceeding 15 %.

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Section 7.3.7.1 of method 8270C (revision 3, 12/96) narrows this 20% maximum to 15%.

In the calibration curve analyzed in this SDG, the average %RSD for all analytes was 10.1%, making the curve acceptable.

Initial analysis of sample WP3235-5 yielded a concentration of the target analyte 2-methylnaphthalene over the upper limit of the calibration curve. Reanalysis occurred at a 1:2 dilution successfully. Both sets of data are included in this data package.

Initial analysis of sample WP3235-6 yielded a low recovery of the surrogate nitrobenzene-d5. Reextraction occurred on August 10, 1999, outside of holding times, following USEPA method 3510. A laboratory control spike/laboratory control spike duplicate pair was extracted in this batch. Surrogate recoveries in WP3235-6RE met QC windows. Both sets of data in this sample are included in the data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP 3235

PAGE: 1 OF 2

COOLER: 1 OF 2

COC#: —
SDG#:
DATE / TIME RECEIVED: 07/30/99 0930
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AL

CLIENT: TetTech

PROJECT: CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 5.3	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT? Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED(1)?	☐	☐	☑		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES(1):

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000044

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3235

PAGE: 2 OF 2

COOLER: 2 OF 2

COC# —
SDG# —
DATE / TIME RECEIVED: 7-13-99 ~ 0930
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: KC

CLIENT: T-Tech

PROJECT: CHARLESTON CAVC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 5.8	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☐	☑		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

00000045

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of

Client: TETRA TECH NUS
Contact: Bryn Howze
Phone #: ( )
Fax #: ( )
Address: NH21 Ave H
City: N. Charleston
State: SC
Zip Code: 29405
Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign): Emily Harrison / Emily Harrison Rob Hill / James R Hill
Copies To:

LAB USE ONLY
WORK ORDER #: WP3235
KATAHDIN PROJECT MANAGER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	Filt. ☐Y☐N PAH	Filt. ☐Y☐N BTEX/NAPH/MTBE Preserv-HCl	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
	306LM1401	071199/ 11:12	GW	5	2	3							
	306LM0201	071199/ 09:09	GW	5	2	3							
	306LM0801	071099/ 17:45	GW	5	2	3							
	306LM1101	071099/ 15:23	GW	5	2	3							
	306LM1001	071099/ 13:19	GW	5	2	3							
	306LM0401	071299/ 09:02	GW	5	2	3							
	306LM1301	071299/ 10:06	GW	5	2	3							
	306LM0901	071299/ 11:34	GW	5	2	3							
	306LM0601	071299/ 1451	GW	5	2	3							
	306LM0601D	071299/ 1451	GW	5	2	3							
	30JL00101	071099/ —	GW			3							
		/											
		/											
		/											
		/											
		/											

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
James R Hill	7/9/99 1700	Fed Ex 810544185784		7-13-99 0930	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3235

Project Manager: Andrea J. Colby
ORDER DATE: 07/13/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 12 AUG
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: E.HARRISON, R.HILL DELIVERED BY: FEDEX DISPOSE: AFTER 11 SEP

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3235-1	30GLM1401	11 JUL 1112	13 JUL	AQ
	WP3235-2	30GLM0201	11 JUL 0909		
	WP3235-3	30GLM0801	10 JUL 1745		
	WP3235-4	30GLM1101	10 JUL 1523		
	WP3235-5	30GLM1001	10 JUL 1319		
	WP3235-6	30GLM0401	12 JUL 0902		
	WP3235-7	30GLM1301	12 JUL 1006		
	WP3235-8	30GLM0901	12 JUL 1134		
	WP3235-9	30GLM0601	12 JUL 1451		
	WP3235-10	30GLM0601D	12 JUL 1451		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	10	125.00	1250.00
Volatile Organics by 8260B	SW8260	10	75.00	750.00
TOTALS		10	200.00	2000.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3235-11	30TL00101	10 JUL	13 JUL	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00

ORDER NOTE: QC-IV NFESC
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA 15220
REPORT & DISK

FINAL PAGE

INVOICE: With Report

TOTAL ORDER AMOUNT $2,075.00
This is NOT an Invoice

AJC/BKR
07-13Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

AD 9/13/99

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.
O-6	Sample reextraction was required due to exceedance of quality control criteria. The original extraction was performed within hold time while reextraction was not within hold time. Results for the reextracted sample met all quality control criteria and are reported here.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-1
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1401	AQ	7/11/99	7/13/99	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	99	%	1.0		
1,2-DICHLOROETHANE-D4	103	%	1.0		
TOLUENE-D8	96	%	1.0		
P-BROMOFLUOROBENZENE	94	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-1
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/2/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1401	AQ	7/11/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	78	%	1.0		
2-FLUOROBIPHENYL	79	%	1.0		
TERPHENYL-D14	76	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-2
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0201	AQ	7/11/99	7/13/99	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	101	%	1.0		
1,2-DICHLOROETHANE-D4	106	%	1.0		
TOLUENE-D8	95	%	1.0		
P-BROMOFLUOROBENZENE	92	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-2
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 7/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0201	AQ	7/11/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	47	%	1.0		
2-FLUOROBIPHENYL	48	%	1.0		
TERPHENYL-D14	73	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-3
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0801	AQ	7/10/99	7/13/99	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	101	%	1.0		
1,2-DICHLOROETHANE-D4	104	%	1.0		
TOLUENE-D8	96	%	1.0		
P-BROMOFLUOROBENZENE	94	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-3
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 7/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0801	AQ	7/10/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	56	%	1.0		
2-FLUOROBIPHENYL	54	%	1.0		
TERPHENYL-D14	66	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-4
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1101	AQ	7/10/99	7/13/99	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	99	%	1.0		
1,2-DICHLOROETHANE-D4	105	%	1.0		
TOLUENE-D8	95	%	1.0		
P-BROMOFLUOROBENZENE	94	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-4
SDG: WP3235
Report Date: 8/24/99
PO No.: N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 7/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1101	AQ	7/10/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	70	%	1.0		
2-FLUOROBIPHENYL	74	%	1.0		
TERPHENYL-D14	61	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-5
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1001	AQ	7/10/99	7/13/99	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	140	ug/L	1.0	5	5
NAPHTHALENE	E390	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	22	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	101	%	1.0		
1,2-DICHLOROETHANE-D4	104	%	1.0		
TOLUENE-D8	97	%	1.0		
P-BROMOFLUOROBENZENE	104	%	1.0		

Report Notes: E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-5DL
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1001	AQ	7/10/99	7/13/99	7/17/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<25	ug/L	5.0	25	5
TOLUENE	<25	ug/L	5.0	25	5
1,2-DIBROMOETHANE	<25	ug/L	5.0	25	5
ETHYLBENZENE	110	ug/L	5.0	25	5
NAPHTHALENE	240	ug/L	5.0	25	5
MTBE	<25	ug/L	5.0	25	5
TOTAL XYLENES	J16	ug/L	5.0	25	5
DIBROMOFLUOROMETHANE	98	%	5.0		
1,2-DICHLOROETHANE-D4	97	%	5.0		
TOLUENE-D8	96	%	5.0		
P-BROMOFLUOROBENZENE	95	%	5.0		

Report Notes: J, O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-5
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 7/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1001	AQ	7/10/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	140	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	E180	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	J6	ug/L	1.0	10	10
FLUORENE	J10	ug/L	1.0	10	10
PHENANTHRENE	J8	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	69	%	1.0		
2-FLUOROBIPHENYL	70	%	1.0		
TERPHENYL-D14	55	%	1.0		

Report Notes: J, E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-5DL
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/3/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1001	AQ	7/10/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	140	ug/L	2.0	20	10
2-METHYLNAPHTHALENE	170	ug/L	2.0	20	10
ACENAPHTHYLENE	<20	ug/L	2.0	20	10
ACENAPHTHENE	<20	ug/L	2.0	20	10
FLUORENE	<20	ug/L	2.0	20	10
PHENANTHRENE	<20	ug/L	2.0	20	10
ANTHRACENE	<20	ug/L	2.0	20	10
FLUORANTHENE	<20	ug/L	2.0	20	10
PYRENE	<20	ug/L	2.0	20	10
BENZO[A]ANTHRACENE	<20	ug/L	2.0	20	10
CHRYSENE	<20	ug/L	2.0	20	10
BENZO[B]FLUORANTHENE	<20	ug/L	2.0	20	10
BENZO[K]FLUORANTHENE	<20	ug/L	2.0	20	10
BENZO[A]PYRENE	<20	ug/L	2.0	20	10
INDENO[1,2,3-CD]PYRENE	<20	ug/L	2.0	20	10
DIBENZ[A,H]ANTHRACENE	<20	ug/L	2.0	20	10
BENZO[G,H,I]PERYLENE	<20	ug/L	2.0	20	10
NITROBENZENE-D5	66	%	2.0		
2-FLUOROBIPHENYL	71	%	2.0		
TERPHENYL-D14	69	%	2.0		

Report Notes: O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-6
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0401	AQ	7/12/99	7/13/99	7/17/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	18	ug/L	1.0	5	5
NAPHTHALENE	40	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	14	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	100	%	1.0		
1,2-DICHLOROETHANE-D4	99	%	1.0		
TOLUENE-D8	94	%	1.0		
P-BROMOFLUOROBENZENE	94	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-6RE
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0401	AQ	7/12/99	7/13/99	8/10/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	19	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	24	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	J8	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	76	%	1.0		
2-FLUOROBIPHENYL	78	%	1.0		
TERPHENYL-D14	83	%	1.0		

Report Notes: J, O-6

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-6
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 7/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0401	AQ	7/12/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	13	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	16	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	J6	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	#24	%	1.0		
2-FLUOROBIPHENYL	49	%	1.0		
TERPHENYL-D14	48	%	1.0		

Report Notes: J, #

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-7
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1301	AQ	7/12/99	7/13/99	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	96	%	1.0		
1,2-DICHLOROETHANE-D4	92	%	1.0		
TOLUENE-D8	96	%	1.0		
P-BROMOFLUOROBENZENE	93	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-7
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 7/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1301	AQ	7/12/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	52	%	1.0		
2-FLUOROBIPHENYL	50	%	1.0		
TERPHENYL-D14	55	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-8
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0901	AQ	7/12/99	7/13/99	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	94	%	1.0		
1,2-DICHLOROETHANE-D4	91	%	1.0		
TOLUENE-D8	96	%	1.0		
P-BROMOFLUOROBENZENE	92	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-8
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/2/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0901	AQ	7/12/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	65	%	1.0		
2-FLUOROBIPHENYL	66	%	1.0		
TERPHENYL-D14	73	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-10
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/2/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0601D	AQ	7/12/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	62	%	1.0		
2-FLUOROBIPHENYL	60	%	1.0		
TERPHENYL-D14	72	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-11
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30TL00101	AQ	7/10/99	7/13/99	7/17/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	98	%	1.0		
1,2-DICHLOROETHANE-D4	100	%	1.0		
TOLUENE-D8	94	%	1.0		
P-BROMOFLUOROBENZENE	90	%	1.0		

Report Notes:

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKF16B

Lab Name: Katahdin Analytical Services SDG No.: WP3235

Lab File ID: F1330 Lab Sample ID: VBLKF16B

Date Analyzed: 07/16/99 Time Analyzed: 10:50

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5972-F

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSF16A	LCSF16A	F1328	7/16/99	9:37:00 AM
30GLM1401	WP3235-1	F1335	7/16/99	2:08:00 PM
30GLM0201	WP3235-2	F1336	7/16/99	2:45:00 PM
30GLM0801	WP3235-3	F1337	7/16/99	3:22:00 PM
30GLM1101	WP3235-4	F1338	7/16/99	3:58:00 PM
30GLM1001	WP3235-5	F1339	7/16/99	4:35:00 PM
30GLM1301	WP3235-7	F1341	7/16/99	5:48:00 PM
30GLM0901	WP3235-8	F1342	7/16/99	6:24:00 PM
30GLM0601	WP3235-9	F1343	7/16/99	7:01:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKF16B
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF16B	AQ	-	-	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	99	%	1.0		
1,2-DICHLOROETHANE-D4	100	%	1.0		
TOLUENE-D8	94	%	1.0		
P-BROMOFLUOROBENZENE	91	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F1328 **Sample ID: LCSF16A** **Date Run: 7/16/99**

Analyst: JSS **Time Injected 9:37:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	57.5	115	60-140
BENZENE	50	52.0	104	60-140
ETHYLBENZENE	50	53.0	106	60-140
MTBE	50	55.2	110	60-140
NAPHTHALENE	50	56.0	112	60-140
TOLUENE	50	52.5	105	60-140
TOTAL XYLENES	150	160	107	60-140

*** Out of Limits** *1*

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKF17A

Lab Name: Katahdin Analytical Services SDG No.: WP3235

Lab File ID: F1346 Lab Sample ID: VBLKF17A

Date Analyzed: 07/17/99 Time Analyzed: 9:10

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5972-F

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSF17A	LCSF17A	F1345	7/17/99	8:19:00 AM
30GLM1401MS	WP3235-1MS	F1347	7/17/99	10:00:00 AM
30GLM1401MSD	WP3235-1MSD	F1348	7/17/99	10:36:00 AM
30GLM0601D	WP3235-10	F1350	7/17/99	11:49:00 AM
30TL00101	WP3235-11	F1351	7/17/99	12:25:00 PM
30GLM0401	WP3235-6	F1352	7/17/99	1:02:00 PM
30GLM1001	WP3235-5DL	F1353	7/17/99	1:38:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKF17A
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF17A	AQ	-	-	7/17/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	97	%	1.0		
1,2-DICHLOROETHANE-D4	95	%	1.0		
TOLUENE-D8	96	%	1.0		
P-BROMOFLUOROBENZENE	93	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F1345 **Sample ID: LCSF17A** **Date Run: 7/17/99**

Analyst: JSS **Time Injected 8:19:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	55.4	111	60-140
BENZENE	50	53.3	107	60-140
ETHYLBENZENE	50	54.6	109	60-140
MTBE	50	53.1	106	60-140
NAPHTHALENE	50	52.9	106	60-140
TOLUENE	50	54.1	108	60-140
TOTAL XYLENES	150	163	109	60-140

*** Out of Limits** *1*

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3235-1	F1335	7/16/99	2:08:00 PM	JSS	AQ	8260_99
WP3235-1MS	F1347	7/17/99	10:00:00 AM	JSS	AQ	8260_99
WP3235-1MSD	F1348	7/17/99	10:36:00 AM	JSS	AQ	8260_99

Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
TOTAL XYLENES	0	150	150	182	145	121	97	60-140	*23	20
TOLUENE	0	50	50	59.2	47.4	118	95	60-140	*22	20
NAPHTHALENE	0	50	50	63.7	50.7	127	101	60-140	*23	20
MTBE	0	50	50	64.3	51.1	129	102	60-140	*23	20
ETHYLBENZENE	0	50	50	60.8	47.5	122	95	60-140	*24	20
BENZENE	0	50	50	58.5	47.4	117	95	60-140	*21	20
1,2-DIBROMOETHANE	0	50	50	66.2	54.2	132	108	60-140	20	20

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;071599

Lab Name: Katahdin Analytical Services SDG No.: WP3235

Lab File ID: Z1577 Lab Sample ID: SBLK;071599

Instrument ID: 5972-Z Date Extracted: 7/15/99

GC Column: RTX-624 ID: 0.18 (mm) Date Analyzed: 07/30/99

Matrix: (soil/water) WATER Time Analyzed: 15:18

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
30GLM0201	WP3235-2	Z1579	7/30/99	4:52:00 PM
30GLM0801	WP3235-3	Z1580	7/30/99	5:39:00 PM
30GLM1101	WP3235-4	Z1581	7/30/99	6:25:00 PM
30GLM1001	WP3235-5	Z1582	7/30/99	7:12:00 PM
30GLM0401	WP3235-6	Z1583	7/30/99	7:59:00 PM
30GLM1301	WP3235-7	Z1584	7/30/99	8:47:00 PM
LCS;071599	LCS;071599	Z1592	8/2/99	11:15:00 AM
30GLM0901	WP3235-8	Z1593	8/2/99	12:04:00 PM
30GLM0601	WP3235-9	Z1594	8/2/99	12:52:00 PM
30GLM0601D	WP3235-10	Z1595	8/2/99	1:40:00 PM
30GLM1401	WP3235-1	Z1605	8/2/99	9:40:00 PM
30GLM1001	WP3235-5DL	Z1620	8/3/99	8:44:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;071599
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 7/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;071599	AQ	-	-	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	62	%	1.0		
2-FLUOROBIPHENYL	64	%	1.0		
TERPHENYL-D14	74	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: Z1592 **Sample ID: LCS;071599** **Date Run: 8/2/99**

Analyst: KRT **Time Injected 11:15:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	23.2	*46	70-130
ACENAPHTHENE	50	28.9	*58	70-130
ACENAPHTHYLENE	50	27.9	*56	70-130
ANTHRACENE	50	41.4	83	70-130
BENZO[A]ANTHRACENE	50	37.5	75	70-130
BENZO[A]PYRENE	50	35.9	72	70-130
BENZO[B]FLUORANTHENE	50	35.3	70	70-130
BENZO[G,H,I]PERYLENE	50	35.0	70	70-130
BENZO[K]FLUORANTHENE	50	38.1	76	70-130
CHRYSENE	50	39.6	79	70-130
DIBENZ[A,H]ANTHRACENE	50	35.1	70	70-130
FLUORANTHENE	50	43.5	87	70-130
FLUORENE	50	33.5	*67	70-130
INDENO[1,2,3-CD]PYRENE	50	37.3	75	70-130
NAPHTHALENE	50	19.7	*39	70-130
PHENANTHRENE	50	38.3	77	70-130
PYRENE	50	33.8	*68	70-130

*** Out of Limits** *1*

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;081099

Lab Name: Katahdin Analytical Services SDG No.: WP3235

Lab File ID: Z1714

Lab Sample ID: SBLK;081099

Instrument ID: 5972-Z

Date Extracted: 8/10/99

GC Column: RTX-624 ID: 0.18 (mm)

Date Analyzed: 08/11/99

Matrix: (soil/water) WATER

Time Analyzed: 18:41

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
30GLM0401	WP3235-6RE	Z1713	8/11/99	5:52:00 PM
LCS;081099	LCS;081099	Z1715	8/11/99	7:29:00 PM
LCSD;081099	LCSD;081099	Z1716	8/11/99	8:16:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;081099
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;081099	AQ	-	-	8/10/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	77	%	1.0		
2-FLUOROBIPHENYL	76	%	1.0		
TERPHENYL-D14	111	%	1.0		

Report Notes:

Katahdin Analytical Services

LCS/LCSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
LCS;081099	Z1715	8/11/99	19:29	KRT	AQ	8270
LCSD;081099	Z1716	8/11/99	20:16	KRT	AQ	8270

Compound Name	Spk Amt ug/L	LCS Result ug/L	LCSD Result ug/L	LCS Rec (%)	LCSD Rec (%)	Rec. Limits (%)	RPD (%)	RPD Limit (%)
2-METHYLNAPHTHALENE	50	42.6	45.1	85	90	70-130	5.7	30
ACENAPHTHENE	50	44.1	48.8	88	98	70-130	11	30
ACENAPHTHYLENE	50	43.9	49.5	88	99	70-130	12	30
ANTHRACENE	50	52.2	62.0	100	120	70-130	18	30
BENZO[A]ANTHRACENE	50	48.2	55.7	96	110	70-130	14	30
BENZO[A]PYRENE	50	40.7	45.5	81	91	70-130	12	30
BENZO[B]FLUORANTHENE	50	38.0	43.6	76	87	70-130	13	30
BENZO[G,H,I]PERYLENE	50	41.8	45.7	84	91	70-130	8	30
BENZO[K]FLUORANTHENE	50	46.3	50.2	93	100	70-130	7.2	30
CHRYSENE	50	49.9	57.2	100	110	70-130	9.5	30
DIBENZ[A,H]ANTHRACENE	50	39.7	47.8	79	96	70-130	19	30
FLUORANTHENE	50	47.8	58.6	96	120	70-130	22	30
FLUORENE	50	43.5	49.0	87	98	70-130	12	30
INDENO[1,2,3-CD]PYRENE	50	45.4	54.5	91	110	70-130	19	30
NAPHTHALENE	50	41.0	42.5	82	85	70-130	3.6	30
PHENANTHRENE	50	48.6	54.8	97	110	70-130	12	30
PYRENE	50	51.0	55.6	100	110	70-130	9.5	30

RPD = (lcs rec - lcsd rec) /[(lcsd rec +lcsd rec)/2] * 100

*** Out of Limits**

Katahdin
ANALYTICAL SERVICES

August 31, 1999

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP3417
Project ID: CNC Charleston
Project Manager: Ms. Andrea J.Colby
Sample Receipt Date(s): 7/28/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Mary S. Morrill
Authorized Signature

8·31·99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on July 28, 1999 and were logged in under Katahdin Analytical Services work order number WP3417 for a hardcopy due date of August 27, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification
WP3417-1	31GLM0201
WP3417-2	29GLM0301
WP3417-3	31GLM0101D
WP3417-4	30GLM1201
WP3417-5	12GLM0401
WP3417-6	29TL00901
WP3417-7	31GLM0101
WP3417-8	29GLM0701

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Six aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on July 28, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this work order were performed on the 5972-S and 5970-Q instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ug/l.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. No matrix spike/matrix spike duplicate was performed on any of the samples in this work order.

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Method 8260B narrows this 20% maximum to 15%.

In the calibration curves analyzed in this SDG, the average %RSD for all analytes was 13.7% and 15.0%, making the curves acceptable.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Six aqueous samples were received by Katahdin Analytical Services laboratory on July 28, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the samples occurred following USEPA method 3510 on July 29, 1999. A laboratory control spike, consisting of all PAH analytes spiked into organic free water, was extracted in the batch, along with a site specific MS/MSD pair on sample WP3417-8.

The initial calibration curve analyzed in this SDG had some of the target analyte %RSD values exceeding 15 %.

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Section 7.3.7.1 of method 8270C (revision 3, 12/96) narrows this 20% maximum to 15%.

In the calibration curve analyzed in this SDG, the average %RSD for all analytes was 10.1%, making the curve acceptable.

Initial analysis of sample WP3417-3 yielded a low recovery of the surrogate 2-fluorobiphenyl. Reanalysis yielded two low base-neutral surrogate recoveries. Both sets of data for this sample are included in the data package.

Initial analysis of sample WP3417-8 yielded internal standard area recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data are included in this data package.

Analysis of the QC sample WP3417-8MS yielded a low recovery of the surrogate terphenyl-d14.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Katahdin
ANALYTICAL SERVICES

Wet Chemistry Analysis

For work order WP3417 analyses for Nitrate (E300) and Sulfate (E300) were performed according to the U.S. EPA "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93/100, August 1993. All samples were run within laboratory hold time. The wet chemistry staff noted no protocol deviations.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP 3417

PAGE: 1 OF 2

COOLER: 1 OF 2

COC#: =
SDG#:
DATE / TIME RECEIVED: 7-28-99 0905
DELIVERED BY: FedEx
RECEIVED BY: Sa
LIMS ENTRY BY: SAW
LIMS REVIEW BY / PM: AJC

CLIENT: Tetra Tech

PROJECT: CNC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐	COC not signed by sampler	
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.2	AJC notified Vonl Calleson by fax 7/28/99
6. SAMPLES RECEIVED AT 4°C +/- 2? (ICE) ICE PACKS PRESENT (Y) or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

Sample I.D.s:
- 31GLMØ1Ø1
- 29GLMØ7Ø1
- 29GLMØ7Ø1M (MSMSD

} VOA VIALS NOT RECEIVED

→ CLIENT NOTIFIED PROJ. MNGR. ~ LOG-IN NOTIFIED PRJ. MNGR UPON RECEIPT.

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000037

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP3417

PAGE: 2 OF 2

COOLER: 2 OF 2

COC#: —
SDG#: —
DATE / TIME RECEIVED: 7.28.99 0905
DELIVERED BY: FedEx
RECEIVED BY: Saw
LIMS ENTRY BY: SAW
LIMS REVIEW BY / PM: ADC

CLIENT: TetraTech

PROJECT: CNC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.8	ASC notified Vaul Calligan by fax 7/28/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000038

Katahdin
ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of ____

Client: Tetra Tech NUS Inc
Contact:
Phone #: (843) 814-9080
Fax #: ( )
Address: NH 21 Ave H
City: N. Charleston
State: S.C.
Zip Code: 29405
Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign):
Copies To:

LAB USE ONLY
WORK ORDER #: WP 3417 - *
KATAHDIN PROJECT MANAGER
REMARKS:
SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE EDB, Naph (Filt. ☐Y☐N)	Dissolved Methane (Filt. ☐Y☐N)	PAH (Filt. ☐Y☐N)	Anions (Nitrate, Sulfate) (Filt. ☐Y☐N)	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
·	31GLMØ1Ø1	7-27-99/1055	GW	9	3	3	2	1						
	31GLMØ2Ø1	/1050		9	3	3	2	1						
	31GLMØ1Ø1D	/1055		5	3		2							
	29GLMØ3Ø1	/1010		9	3	3	2	1						
·	29GLMØ7Ø1	/1245		5	3		2							
·	29GLMØ7Ø1M	/1245		5	3		2			← MS/MSD				
	32GLMØ4Ø1	7/24/99/1605		3	3									
	3ØGLM12Ø1	7/27/99/1721		5	3		2							
	29TLØØ9Ø1	7/27/99/0720		3	3									
		/												
		/												
		/												
		/												
		/												
		/												
		/												

COMMENTS
* Sample #29GLMØ7Ø1M is an MS/MSD

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	7/29/99	813402904543		7-28-990905	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

FORMSOURCE INC. ☎ (207) 782-3311
FORM # CHN-OF-CSTDY

ORIGINAL

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3417

Project Manager: Andrea J. Colby
ORDER DATE: 07/28/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 27 AUG
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 27 AUG

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3417-1	31GLM0201	27 JUL 1050	28 JUL	AQ
	WP3417-2	29GLM0301	27 JUL 1010		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00
GC Subcontract		2	95.00	190.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	125.00	250.00
Nitrogen, Nitrate (as N)	E300	2	30.00	60.00
Sulfate (as SO4)	E300	2	0.00	0.00
TOTALS		2	325.00	650.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3417-3	31GLM0101D	27 JUL 1055	28 JUL	AQ
	WP3417-4	30GLM1201	27 JUL 1721		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	125.00	250.00
TOTALS		2	200.00	400.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3417-5	12GLM0401	24 JUL 1605	28 JUL	AQ
	WP3417-6	29TL00901	27 JUL 0730		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00

LABORATORY ORDER CONTINUED ON PAGE 2

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3417

Project Manager: Andrea J. Colby
ORDER DATE: 07/28/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 27 AUG
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 27 AUG

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3417-7	31GLM0101	27 JUL 1055	28 JUL	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
GC Subcontract		1	95.00	95.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00
Nitrogen, Nitrate (as N)	E300	1	30.00	30.00
Sulfate (as SO4)	E300	1	0.00	0.00
TOTALS		1	250.00	250.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP3417-8	29GLM0701	27 JUL 1245	28 JUL	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00

ORDER NOTE: QC-IV NFESC
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURG, PA 15220

INVOICE: With Report

TOTAL ORDER AMOUNT $1,575.00
This is NOT an Invoice

AJC/BKR
07-28Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

9009041

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
O-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3417-4
SDG: WP3417
Report Date: 8/26/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1201	AQ	7/27/99	7/28/99	7/29/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	55	%	1.0		
2-FLUOROBIPHENYL	55	%	1.0		
TERPHENYL-D14	73	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3417-4
SDG: WP3417
Report Date: 8/26/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/2/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM1201	AQ	7/27/99	7/28/99	8/2/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	124	%	1.0		
1,2-DICHLOROETHANE-D4	127	%	1.0		
TOLUENE-D8	112	%	1.0		
P-BROMOFLUOROBENZENE	90	%	1.0		

Report Notes:

4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;072999

Lab Name: Katahdin Analytical Services SDG No.: WP3417

Lab File ID: Z1692

Lab Sample ID: SBLK;072999

Instrument ID: 5972-Z

Date Extracted: 7/29/99

GC Column: RTX-624 ID: 0.18 (mm)

Date Analyzed: 08/10/99

Matrix: (soil/water) WATER

Time Analyzed: 12:49

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;072999	LCS;072999	Z1693	8/10/99	1:34:00 PM
31GLM0201	WP3417-1	Z1694	8/10/99	2:20:00 PM
31GLM0101D	WP3417-3	Z1696	8/10/99	3:51:00 PM
30GLM1201	WP3417-4	Z1697	8/10/99	4:37:00 PM
31GLM0101	WP3417-7	Z1698	8/10/99	5:23:00 PM
29GLM0701	WP3417-8	Z1699	8/10/99	6:09:00 PM
29GLM0701MSD	WP3417-8MSD	Z1701	8/10/99	7:41:00 PM
29GLM0301	WP3417-2	Z1707	8/11/99	12:28:00 PM
31GLM0101D	WP3417-3RA	Z1708	8/11/99	1:14:00 PM
29GLM0701	WP3417-8RA	Z1709	8/11/99	2:00:00 PM
29GLM0701MS	WP3417-8MS	Z1710	8/11/99	2:45:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;072999
SDG: WP3417
Report Date: 8/26/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;072999	AQ	-	-	7/29/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	60	%	1.0		
2-FLUOROBIPHENYL	61	%	1.0		
TERPHENYL-D14	96	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: Z1693 **Sample ID: LCS;072999** **Date Run: 8/10/99**

Analyst: KRT **Time Injected 1:34:00 PM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	34.8	*70	70-130
ACENAPHTHENE	50	36.8	74	70-130
ACENAPHTHYLENE	50	37.2	74	70-130
ANTHRACENE	50	45.3	90	70-130
BENZO[A]ANTHRACENE	50	42.2	84	70-130
BENZO[A]PYRENE	50	35.9	72	70-130
BENZO[B]FLUORANTHENE	50	34.4	*69	70-130
BENZO[G,H,I]PERYLENE	50	35.7	71	70-130
BENZO[K]FLUORANTHENE	50	40.4	81	70-130
CHRYSENE	50	43.4	87	70-130
DIBENZ[A,H]ANTHRACENE	50	32.8	*66	70-130
FLUORANTHENE	50	41.7	83	70-130
FLUORENE	50	37.0	74	70-130
INDENO[1,2,3-CD]PYRENE	50	35.0	70	70-130
NAPHTHALENE	50	34.6	*69	70-130
PHENANTHRENE	50	42.4	85	70-130
PYRENE	50	48.6	97	70-130

*** Out of Limits**

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-9
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0601	AQ	7/12/99	7/13/99	7/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	96	%	1.0		
1,2-DICHLOROETHANE-D4	96	%	1.0		
TOLUENE-D8	96	%	1.0		
P-BROMOFLUOROBENZENE	90	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-9
SDG: WP3235
Report Date: 8/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/2/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0601	AQ	7/12/99	7/13/99	7/15/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	62	%	1.0		
2-FLUOROBIPHENYL	62	%	1.0		
TERPHENYL-D14	76	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3235-10
SDG: WP3235
Report Date: 8/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0601D	AQ	7/12/99	7/13/99	7/17/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	96	%	1.0		
1,2-DICHLOROETHANE-D4	97	%	1.0		
TOLUENE-D8	94	%	1.0		
P-BROMOFLUOROBENZENE	91	%	1.0		

Report Notes:

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3417-8	Z1699	8/10/99	6:09:00 PM	KRT	AQ	8270_99
WP3417-8MS	Z1710	8/11/99	2:45:00 PM	KRT	AQ	8270_99
WP3417-8MSD	Z1701	8/10/99	7:41:00 PM	KRT	AQ	8270_99

Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	49	48	24.0	39.7	*49	83	60-140	*49	30
ACENAPHTHENE	0	49	48	29.3	35.3	60	73	60-140	18	30
ACENAPHTHYLENE	0	49	48	30.2	35.2	62	73	60-140	15	30
ANTHRACENE	0	49	48	30.9	42.0	63	88	60-140	30	30
BENZO[A]ANTHRACENE	0	49	48	22.8	38.0	*46	79	60-140	*50	30
BENZO[A]PYRENE	0	49	48	18.2	32.0	*37	67	60-140	*55	30
BENZO[B]FLUORANTHENE	0	49	48	16.6	29.5	*34	62	60-140	*56	30
2-METHYLNAPHTHALENE	0	49	48	28.2	33.2	*58	69	60-140	16	30
BENZO[K]FLUORANTHENE	0	49	48	23.0	38.8	*47	81	60-140	*51	30
PYRENE	0	49	48	30.4	45.0	62	94	60-140	*39	30
DIBENZ[A,H]ANTHRACENE	0	49	48	16.7	28.8	*34	60	60-140	*53	30
FLUORANTHENE	0	49	48	24.6	37.8	*50	79	60-140	*42	30
FLUORENE	0	49	48	27.8	34.1	*57	71	60-140	20	30
INDENO[1,2,3-CD]PYRENE	0	49	48	16.3	29.9	*33	62	60-140	*59	30
NAPHTHALENE	0	49	48	29.5	32.6	60	68	60-140	10	30
PHENANTHRENE	0	49	48	29.4	38.8	60	81	60-140	28	30
BENZO[G,H,I]PERYLENE	0	49	48	17.6	31.8	*36	66	60-140	*57	30

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKS02A

Lab Name: Katahdin Analytical Services SDG No.: WP3417

Lab File ID: S5770 Lab Sample ID: VBLKS02A

Date Analyzed: 08/02/99 Time Analyzed: 9:50

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5972-S

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSS02A	LCSS02A	S5769	8/2/99	9:02:00 AM
31GLM0101D	WP3417-3	S5781	8/2/99	5:03:00 PM
30GLM1201	WP3417-4	S5782	8/2/99	5:41:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKS02A
SDG: WP3417
Report Date: 8/26/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/2/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKS02A	AQ	-	-	8/2/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	104	%	1.0		
1,2-DICHLOROETHANE-D4	102	%	1.0		
TOLUENE-D8	112	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: S5769 **Sample ID: LCSS02A** **Date Run: 8/2/99**

Analyst: KMC **Time Injected 9:02:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	48.4	97	60-140
BENZENE	50	50.6	101	60-140
ETHYLBENZENE	50	59.4	119	60-140
MTBE	50	52.3	104	60-140
NAPHTHALENE	50	62.6	125	60-140
TOLUENE	50	54.4	109	60-140
TOTAL XYLENES	150	186	124	60-140

*** Out of Limits**

ENSR
Air Toxics Specialty Laboratory
42 Nagog Park
Acton, MA 01720

DATE: August 26, 1999

TO: Andrea Colby
Katahdin Analytical
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098

Re: Organic Analyses of Aqueous Samples by Gas Chromatography Flame Ionization Detection (GC/FID)

PROJECT #: **8601-008-200**

LAB ID #: **990123**

ANALYTICAL PROCEDURE:

Three (3) aqueous samples were analyzed under the guidelines of EPA SW846 Method 3810.

A Hewlett Packard 5890 series II gas chromatograph (GC) equipped with a Hewlett Packard flame ionization detector (FID) was used for the analysis. A 1.0 mL headspace aliquot of each sample was injected into the column for analysis. The operating conditions of the GC/FID are listed in Table 1. A five point calibration was performed for the target analytes (methane, ethane, and ethylene).

No problems occurred during sample receipt or log-in.

QUALITY CONTROL:

1. A laboratory blank was analyzed daily in the same manner as the samples. Target analytes were not detected in the blank.

2. A Matrix Spike/MSD was performed on the following sample:
   WP3417-7

   All recoveries were within QC limits.

Date Samples Received by the Laboratory: 7/28/99

Date Analysis Started: 8/4/99

C:\My Documents\katrpt10.doc

SAMPLE LOG-IN & RECEIPT CHECKLIST

Client/Proj #: Katahdin WP 3417 / 8601-008-200

Proj Mgr: M. Hoyt

Lab Pool #: 990123

Inspected & Logged in by: A MacDuff

Date Time: 7/29/99 1015

Sample Matrix	Number of Samples	Analysis Requested	Analyze by (date)	Storage Location
Aqueous	3	MEE	8/25/99	R1

Circle the appropriate response:

1) Shipped Hand delivered

2) COC present / not present on receipt

3) COC Tape present / not present on shipping container

4) Samples broken / intact on receipt

5) Samples ambient / chilled on receipt Temp blank = 5°C

6) Samples preserved correctly / incorrectly / none recommended

7) Received within / outside holding time

8) COC tapes present / not present on samples

9) Discrepancies / NO discrepancies noted between COCs and samples

Additional Comments: 3 VOAs per sample

Andrea Colby

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

190123

PLEASE PRINT IN PEN

Page ____ of ____

Client	Contact	Phone #	Fax #
KATAHDIN ANALYTICAL SERVICES	ANDREA COLBY	( )	( )

Address	City	State	Zip Code
SAME AS ABOVE			

Purchase Order #	Proj. Name / No.	Katahdin Quote #

Bill (if different than above)	Address

Sampler (Print / Sign)	Copies To:

LAB USE ONLY WORK ORDER #: -

KATAHDIN PROJECT MANAGER _____

REMARKS: SUB. TO ENSR

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO: _____

TEMP°C _____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	METHANE ETHENE ETHANE	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
								LOGIN							
	WP3417-1	7/27/99 1050	AQ	3	X			190123	1						
	-2	1010			X				-2						
	-7	1055			X				-3						
		/													
		/													
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COMMENTS

QC-IV NFESC DD (KAS007QC-D83) Results Due: 8-25-99

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
DD (SX)	7-28-99 1445				
Relinquished By: (Signature)	**Date / Time**	**Received By: (Signature)**	**Relinquished By: (Signature)**	**Date / Time**	**Received By: (Signature)**
					9/30/99 1015

FILE COPY

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3417-1(H)

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990123-1

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___ KTH_028_____

Level: (low/med) _____ low _____ Date Received:___7/29/99 _____

% Moisture: _____ NA _____ Date Analyzed:___8/4/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	5.2	U
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3417-2(H)

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990123-2

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KTH_029

Level: (low/med) low

Date Received: 7/29/99

% Moisture: NA

Date Analyzed: 8/4/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	5.2	U
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3417-7(C)

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) ____ water _____ Lab Sample ID: 990123-3

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTH_030_____

Level: (low/med) _____ low _____ Date Received:___7/29/99 _____

% Moisture: ____ NA _____ Date Analyzed:___8/4/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:____ 1 _____

Soil Extract Volume: ____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	5.2	U
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK01

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: MB990123

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTH_026_____

Level: (low/med) _____ low _____ Date Received:___NA _____

% Moisture: _____ NA _____ Date Analyzed:___8/4/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	5.2	U
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LCS01

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) ____ water _____ Lab Sample ID: LCS990123

Sample wt / vol: ___ 32.5 ml _____ (g/ml) Lab File ID: __KTH_027_____

Level: (low/med) _____ low _____ Date Received:__NA _____

% Moisture: ____ NA _____ Date Analyzed:__8/4/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:____ 1_____

Soil Extract Volume: ____ NA ___ (µl) Soil Aliquot Volume: ___ NA ___ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	38	
74-85-1	Ethene	66	
74-84-0	Ethane	70	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3417-7(A)MS

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) ____ water _____ Lab Sample ID: 990123-3 MS

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: __KTH_031_____

Level: (low/med) _____ low _____ Date Received:__7/29/99 _____

% Moisture: ____ NA _____ Date Analyzed:__8/4/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:____ 1_____

Soil Extract Volume: ____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	370	
74-85-1	Ethene	620	
74-84-0	Ethane	690	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3417-7(B) MSD

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990123-3 MSD

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTH_032_____

Level: (low/med) _____ low _____ Date Received:___7/29/99 _____

% Moisture: _____ NA _____ Date Analyzed:___8/4/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____1_____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	280	
74-85-1	Ethene	480	
74-84-0	Ethane	530	

METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK01

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Lab File ID: __KTH_026_____ Lab Sample I MB990123

Instrument ID: _____ HPGC#3_____ Date Analyzed:_8/4/99_____

Matrix: (soil/water) _____ water _____ Level: (low/med) _____ low _____

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES; MS AND MSD

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	LCS01	LCS990123	KTH_027	08/04/99
02	WP3417-1(H)	990123-1	KTH_028	08/04/99
03	WP3417-2(H)	990123-2	KTH_029	08/04/99
04	WP3417-7(C)	990123-3	KTH_030	08/04/99
05	WP3417-7(A) MS	990123-3 MS	KTH_031	08/04/99
06	WP3417-7(B) MSD	990123-3 MSD	KTH_032	08/04/99
07				
08				
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22				
23				
24				
25				
26				

COMMENTS:

LABORATORY CONTROL SPIKE RECOVERY

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case NO.: _____ SAS NO.: _____ SDG NO.: _____

Laboratory Control Sample No: _____ LCS01 _____

COMPOUND	SPIKE ADDED (µg/L)	LCS CONCENTRATION (µg/L)	LCS % REC #	QC LIMITS REC.
Methane	41.03	38.28	93%	50 - 150
Ethene	71.04	65.55	92%	50 - 150
Ethane	77.69	70.18	90%	50 - 150

* - Values outside of QC limits.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case NO.: _____ SAS NO.: _____ SDG NO.: _____

Matrix Spike - EPA Sample NO.: __WP3417-7 _____

COMPOUND	SPIKE ADDED (µg/L)	SAMPLE CONCENTRATION (µg/L)	MS CONCENTRATION (µg/L)	MS % REC #	QC LIMITS REC.
Methane	410.3	0	371.8	91%	50-150
Ethene	710.4	0	624.4	88%	50-150
Ethane	777.0	0	689.1	89%	50-150

COMPOUND	SPIKE ADDED (µg/L)	MSD CONCENTRATION (µg/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Methane	410.3	283.9	69%	27%	50	50-150
Ethene	710.4	484.5	68%	25%	50	50-150
Ethane	777.0	530.4	68%	26%	50	50-150

Spike recovery: _____ 0 _____ out of ____ 6 ___ outside limits.
RPD: _____ 0 ____ out of ___ 3 ____ outside limits.

Comments:

_____

_____

Katahdin
ANALYTICAL SERVICES

October 1, 1999

Mr. Paul Calligan

Tetra Tech Nus

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

RE: Katahdin Lab Number: WP3703

Project ID: CNC Charleston

Project Manager: Ms. Andrea J.Colby

Sample Receipt Date(s): 8/24/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Patricia Homey
Authorized Signature

10/1/99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on August 24, 1999 and were logged in under Katahdin Analytical Services work order number WP3703 for a hardcopy due date of September 23, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample Identification
WP3703-1	26GLM0801	
WP3703-2	26GLM10D01	
WP3703-3	26GLM0401	
WP3703-4	26GLM0601	
WP3703-5	26GLM0501	
WP3703-6	26GLM0701	
WP3703-7	26GLM0701D	
WP3703-8	13GLM0601	
WP3703-9	32GLM0601	
WP3703-10	21GLM0301	
WP3703-11	21GLM0201	
WP3703-12	21GLM0201D	
WP3703-13	21GLM07D01	
WP3703-14	21GLM0801	
WP3703-15	26GLM09D01	
WP3703-16	26GLM0301	
WP3703-17	26GLM0201	
WP3703-18	30GLM0301	
WP3703-19	30GLM0701	
WP3703-20	30GLM0101	
WP3703-21	30GLM0501	
WP3703-22	26TL00101	
WP3703-23	24SLB070405	
WP3703-24	24SLB040304	9908879-01
WP3703-25	24SLB020203	
WP3703-26	24SLB040304D	9908879-05
WP3703-27	42SLP200304	
WP3703-28	42SLP210304	

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Six soil/sediment and twenty-two aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on August 24, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5970-Q (aqueous), 5972-F (aqueous), 5973-U (low level soil), and 5972-M (low level soil) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. Matrix spike/matrix spike duplicate pairs were performed on samples WP3703-2 (aqueous) and WP3703-28 (soil).

Initial analysis of sample WP3703-20 yielded a concentration of naphthalene over the upper limit of the calibration curve. Reanalysis occurred at a 1:2 dilution successfully. Both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Six soil/sediment and twenty-one aqueous samples were received by Katahdin Analytical Services laboratory on August 24, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the soil samples occurred following USEPA method 3550 on August 24 and 25, 1999. A laboratory control spike was extracted in each batch, along with a matrix spike/matrix spike duplicate pair on sample WP3703-26 in the 08/25/99 extraction batch.

Extraction of aqueous samples WP3703 1-13, 15, 16, 18-21 were extracted following USEPA method 3510 on August 25, 1999. A laboratory control spike was extracted in the batch, along with a matrix spike/matrix spike duplicate pair on sample WP3703-2. Sample WP3703-17 was

extracted on August 26, 1999, following USEPA method 3510. A laboratory control spike was extracted in the batch.

The original extract for sample WP3703-14 was lost during the concentration process. This sample was reextracted on September 8, 1999, outside of extraction holding times. A laboratory control spike was extracted in this batch.

Analysis of sample WP3703-3 yielded a low recovery of the surrogate nitrobenzene-d5. No reextraction was performed due to the obvious matrix/chromatographic interferences.

Initial analysis of sample WP3703-13 yielded a low surrogate recovery. Reanalysis yielded a similar result. The sample was reextracted on September 10, 1999, outside of extraction holding times, following USEPA method 3510. Surrogate recoveries for this reextracted sample met QC windows. All three sets of data for this sample are included in this data package.

Initial analysis of sample WP3703-16 yielded low surrogate recoveries. The sample was reextracted on September 10, 1999, outside of extraction holding times, following USEPA method 3510. Surrogate recoveries for this reextracted sample met QC windows. Both sets of data for this sample are included in this data package.

Initial analysis of sample WP3703-20 yielded concentrations of naphthalene and 2-methylnaphthalene over the upper limit of the calibration curve. Reanalysis occurred at a 1:2 dilution successfully. Both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Wet Chemistry Analysis

Alternate method for analysis of nitrate was approved by Kelly Johnson-Carper due to holding time constraints upon sample arrival. All analyses were performed within hold time. No protocol deviations were noted by the Wet Chemistry staff.

Metals Analysis

The samples of Katahdin Work Order WP3703 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Soil-matrix Katahdin Sample Nos. WP3703-(24, 25, 26) were originally digested for ICP analysis on 08/26/99 (QC Batch PH26ICS0) in accordance with USEPA Method 3050B. The measured zinc concentration (0.16 mg/L) of the preparation blank that is associated with QC Batch PH26ICS0 exceeds the laboratory's acceptance limits, and therefore redigestion of Katahdin Sample Nos. WP3703-(24, 25, 26) for zinc was required. In addition, the digestate of Katahdin Sample No. WP3703-25 was spilled (and lost) before ICP analyses of antimony, arsenic, iron, lead, selenium, and thallium were completed, so redigestion of this sample was necessary to provide additional digestate volume for analysis. For these reasons, Katahdin Sample Nos. WP3703-(24, 25, 26) were redigested for ICP analysis on 09/02/99 (QC Batch PI02ICS0, containing Katahdin Sample No. WP3703-25) and 09/13/99 (QC Batch PI13ICS1, containing Katahdin Sample Nos. WP3703-24 and WP3703-26). These redigestates are identified throughout the raw data by the suffix "R" appended to the Katahdin sample number, e.g. "WP3703-025R".

The measured recovery (161.9%) for the laboratory control sample that is associated with QC Batch PI02ICS0 exceeds the laboratory's acceptance limits, and Katahdin Sample No. WP3703-25 therefore required redigestion for iron analysis. Katahdin Sample No. WP3703-25 was redigested a second time for ICP analysis on 09/14/99 (QC Batch PI14ICS0). This redigestate is identified throughout the raw data by the suffix "X" appended to the Katahdin sample number, e.g. "WP3703-025X".

ICP analyses of Katahdin Work Order WP3703 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Soil-matrix Katahdin Sample Nos. WP3703-(24, 25, 26) were digested for mercury analysis on 09/03/99 (QC Batch PI03HGS0) in accordance with USEPA Method 7470A. Katahdin Sample No. WP3703-24 was prepared with duplicate matrix-spiked aliquots.

Mercury analyses of Katahdin Work Order WP3703 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP 3703

PAGE: 1 OF 5

COOLER: 1 OF 5

COC# —
SDG#
DATE / TIME RECEIVED: 8-24-99 0850
DELIVERED BY: FedEx
RECEIVED BY: Sa
LIMS ENTRY BY: BEK
LIMS REVIEW BY / PM: AOL

CLIENT: Tetra Tech

PROJECT: CNC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED(1)?	☐	☐	☑		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES(1):

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP 3703

PAGE: 2 OF 5

COOLER: 2 OF 5

COC#: —
SDG#: —
DATE / TIME RECEIVED: 8-24-99 0850
DELIVERED BY: FedEx
RECEIVED BY: Sen
LIMS ENTRY BY: BKW
LIMS REVIEW BY / PM: ADC

CLIENT: Tetra Tech

PROJECT: CNC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☐	☑	☐		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.6	ADC notified Vonl Calliga by fax 8/24/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☐	☐	☑		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☐	☑		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

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KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT

Tel. (207) 874-2400
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LAB (WORK ORDER) #: WP 3703

PAGE: 3 OF 5

COOLER: 3 OF 5

CLIENT: TetraTech

PROJECT: CNC

COC#: —
SDG#: —
DATE / TIME RECEIVED: 8-24-99 0850
DELIVERED BY: FedEx
RECEIVED BY: Sa
LIMS ENTRY BY: BEK
LIMS REVIEW BY / PM: ADC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☐	☑	☐	TEMP BLANK TEMP (°C)=	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= 3.1 NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☐	☐	☑		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☐	☑		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
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LAB (WORK ORDER) #: WP 3703

PAGE: 4 OF 5

COOLER: 4 OF 5

COC#: —
SDG#: —
DATE / TIME RECEIVED: 8-24-99 0850
DELIVERED BY: FedEx
RECEIVED BY: Sa
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: ADC

CLIENT: Tetra Tech

PROJECT: CNC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.0	AK notified Dave Callisan by fax 8/24/99
6. SAMPLES RECEIVED AT 4°C +/- 2? (ICE) ICE PACKS PRESENT (Y) or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☐	☐	☑		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☐	☑		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3703

PAGE: 5 OF 5

COOLER: 5 OF 5

COC# —
SDG# —
DATE / TIME RECEIVED: 8-24-99 0850
DELIVERED BY: FedEx
RECEIVED BY: Sa
LIMS ENTRY BY: BKA
LIMS REVIEW BY / PM: AJC

CLIENT: Tetra Tech

PROJECT: CNC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑*	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.8	AJC notified Paul Calliga by fax 8/24/99.
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☐	☐	☑		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED(1)?	☐	☐	☑		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES(1): * 1 of 2 PAH bottles for sample 26GLM09D01 is labeled 26GLM0901 (date/time matches)

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000143

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client	Contact	Phone #	Fax #
Tetra Tech NUS	Bryn Howze	(843) 554-4925	( )

Address	City	State	Zip Code
NH-21 Ave. H	N. Charleston	SC	

Purchase Order # | Proj. Name / No. | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign) | Copies To:

LAB USE ONLY WORK ORDER #: WP3703 -*

KATAHDIN PROJECT MANAGER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE, EDB, Naph (Filt. ☐Y☐N)	PAH (Filt. ☐Y☐N)	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
	26GLM08Ø1	8/21/99/1513	aq	5	3	2								
	26GLM1ØDØ1M	8/21/99/1240	aq	5	3	2					←	MS/MSD		
	26GLM1ØDØ1	8/21/99/1240	aq	5	3	2								
	26GLMØ4Ø1	8/21/99/0945	aq	5	3	2								
	26GLMØ6Ø1	8/21/99/1005	aq	5	3	2								
	26GLMØ5Ø1	8/21/99/0945	aq	5	3	2								
	26GLMØ7Ø1	8/21/99/1155	aq	5	3	2								
	26GLMØ7Ø1D	8/21/99/	aq	5	3	2								
	13GLMØ6Ø1	8/21/99/1140	aq	5	3	2								
	32GLMØ6Ø1	8/21/99/1557	aq	5	3	2								
	21GLMØ3Ø1	8/22/99/1152	aq	5	3	2								
	21GLMØ2Ø1	8/22/99/0955	aq	5	3	2								
	21GLMØ2Ø1D	8/22/99	aq	5	3	2								
	21GLMØ7DØ1	8/22/99/1430	aq	5	3	2								
	21GLMØ8Ø1	8/22/99/1500	aq	5	3	2								
	24SLBØ7Ø4Ø5	8/23/99/0915	soil	5	4	1						4ppm		

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
E. J. Hamm	8/23/99 1850	8134Ø2681727		8-24-99 0850	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: Tetra Tech NUS
Contact: Bryn Hence
Phone #: (843) 554-4925 ( )
Fax #:
Address: NH-21 Ave. H
City: N. Charleston
State: SC
Zip Code:
Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign):
Copies To:

LAB USE ONLY
WORK ORDER #: WP3703 -
KATAHDIN PROJECT MANAGER
REMARKS:
SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE, EDB, Naph	PAH	TAL Metals	Grain Size	Dissolved methane	Anions				FID Rdφ
					Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
*	24SLBφ2φ2φ3	8/23/99 1045	soil	5	4	1	1							60ppm
*	24SLBφ4φ3φ4	8/23/99 0950	soil	6	4	1	1	+	X Run	Fac.	from	PAH	jar	50pp
*	24SLBφ4φ3φ4D	8/23/99	soil	5	4	1	1		X	Run	Fac.	from	PAH jar	50pp
	26GLMφ9Dφ1	8/22/99 1645	aq	5	3	2								
	26GLMφ3φ1	8/22/99 1515	aq	5	3	2								
	26GLMφ2φ1	8/22/99 1530	aq	5	3	2								
	30GLMφ1φ1	8/22/99 1810	aq	9	3	2			3	1				
	30GLMφ3φ1	8/22/99 1610	aq	5	3	2								
	30GLMφ5φ1	8/22/99 1225	aq	9	3	2			3	1				
	30GLMφ7φ1	8/22/99 1515	aq	5	3	2								
	42SLP200304	8/23/99 1400	soil	5	4	1	← 48 hour turn around							3.2 pp
	42SLP210304	8/23/99 1415	soil	5	4	1	← 48 hour turn around							2.6ppm
	26TL00101	8/23/99	aq	2	2									
		/												
		/												
		/												

COMMENTS
* Do TAL metals analysis from PAH jar.

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
	8-24-99 0850				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3703

Project Manager: Andrea J. Colby
ORDER DATE: 08/24/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 23 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 23 OCT

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3703-1	26GLM0801	21 AUG 1513	24 AUG	AQ
	WP3703-2	26GLM10D01	21 AUG 1240		
	WP3703-3	26GLM0401	21 AUG 0945		
	WP3703-4	26GLM0601	21 AUG 1005		
	WP3703-5	26GLM0501	21 AUG 0945		
	WP3703-6	26GLM0701	21 AUG 1155		
	WP3703-7	26GLM0701D	21 AUG		
	WP3703-8	13GLM0601	21 AUG 1140		
	WP3703-9	32GLM0601	21 AUG 1557		
	WP3703-10	21GLM0301	22 AUG 1152		
	WP3703-11	21GLM0201	22 AUG 0955		
	WP3703-12	21GLM0201D	22 AUG		
	WP3703-13	21GLM07D01	22 AUG 1430		
	WP3703-14	21GLM0801	22 AUG 1500		
	WP3703-15	26GLM09D01	23 AUG 1645		
	WP3703-16	26GLM0301	23 AUG 1515		
	WP3703-17	26GLM0201	23 AUG 1520		
	WP3703-18	30GLM0301	22 AUG 1610		
	WP3703-19	30GLM0701	22 AUG 1515		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	19	75.00	1425.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	19	125.00	2375.00
TOTALS		19	200.00	3800.00

LABORATORY ORDER CONTINUED ON PAGE 2

0000146 LMK 8/24/99

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3703

Project Manager: Andrea J. Colby
ORDER DATE: 08/24/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 23 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 23 OCT

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3703-20	30GLM0101	22 AUG 1210	24 AUG	AQ
	WP3703-21	30GLM0501	22 AUG 1225		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	125.00	250.00
Nitrate as N	353.2	2	30.00	60.00
Sulfate (as SO4)	E300	2	0.00	0.00
Methane Subcontract		2	95.00	190.00
TOTALS		2	325.00	650.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3703-22	26TL00101	23 AUG	24 AUG	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3703-23	24SLB070405	23 AUG 0915	24 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Volatile Organics by 8260B	SW8260	1	85.00	85.00
TOTALS		1	220.00	220.00

LABORATORY ORDER CONTINUED ON PAGE 3

0000147 MSD 10/6/99
~~0000129~~ 10/5/99

ORDER NO WP-3703

Project Manager: Andrea J. Colby
ORDER DATE: 08/24/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 23 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 23 OCT

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP3703-24	24SLB040304	23 AUG 0950	24 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Target Analyte List Metals, Total		1	100.00	100.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Grain Size Subcontract		1	110.00	110.00
Total Combustible Organics	ASTM D2974	1	30.00	30.00
TOC Subcontract		1	60.00	60.00
TPH Subcontract		1	75.00	75.00
TOTALS		1	595.00	595.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP3703-25	24SLB020203	23 AUG 1045	24 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Target Analyte List Metals, Total		1	100.00	100.00
TOTALS		1	320.00	320.00

LABORATORY ORDER CONTINUED ON PAGE 4

ORDER NO WP-3703

Project Manager: Andrea J. Colby
ORDER DATE: 08/24/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 23 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 23 OCT

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
7	WP3703-27	42SLP200304	23 AUG 1400	24 AUG	SL
	WP3703-28	42SLP210304	23 AUG 1415		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	85.00	170.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	135.00	270.00
Solids-Total Residue (TS)	CLP/CIP SO	2	0.00	0.00
TOTALS		2	220.00	440.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
8	WP3703-26	24SLB040304D	23 AUG	24 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Total Combustible Organics	ASTM D2974	1	30.00	30.00
TOC Subcontract		1	60.00	60.00
Target Analyte List Metals, Total		1	100.00	100.00
TPH Subcontract		1	75.00	75.00
TOTALS		1	485.00	485.00

LABORATORY ORDER CONTINUED ON PAGE 5

ORDER NO WP-3703

Project Manager: Andrea J. Colby
ORDER DATE: 08/24/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 23 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 23 OCT

ORDER NOTE: QC-II+ W/NARRATIVE
DD(KAS007QC-DB3)
CNC CHARLESTON
NFESC

REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH, PA 15220
REPORT AND DISK

INVOICE: With Report

TOTAL ORDER AMOUNT $6,585.00
This is NOT an Invoice

AJC/BKR/WEST.AJC(dw)
09-21Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

0000150
9/21/99

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-18
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/9/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0301	AQ	8/22/99	8/24/99	8/25/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	69	%	1.0		
2-FLUOROBIPHENYL	72	%	1.0		
TERPHENYL-D14	95	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-18
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0301	AQ	8/22/99	8/24/99	8/26/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	J4	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	97	%	1.0		
1,2-DICHLOROETHANE-D4	95	%	1.0		
TOLUENE-D8	101	%	1.0		
P-BROMOFLUOROBENZENE	100	%	1.0		

Report Notes: J

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-19
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/9/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0701	AQ	8/22/99	8/24/99	8/25/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	70	%	1.0		
2-FLUOROBIPHENYL	71	%	1.0		
TERPHENYL-D14	89	%	1.0		

Report Notes:

0000046

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-19
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0701	AQ	8/22/99	8/24/99	8/26/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	95	%	1.0		
1,2-DICHLOROETHANE-D4	96	%	1.0		
TOLUENE-D8	102	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3703-20
Report Date: 10/01/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30GLM0101	Aqueous	CLIENT	08/22/99	08/24/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N	<0.050	mg/L	1.0	0.050	353.2	08/24/99	CF	
Sulfate (as SO4)	1.2	mg/L	1.0	1.0	E300	09/17/99	CF	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/01/99

LJO/baeajc(dw)/msm
PH24NOW1
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-20
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/9/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0101	AQ	8/22/99	8/24/99	8/25/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	E160	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	E190	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	10	ug/L	1.0	10	10
PHENANTHRENE	J9	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	69	%	1.0		
2-FLUOROBIPHENYL	75	%	1.0		
TERPHENYL-D14	101	%	1.0		

Report Notes: J, E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-20DL
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0101	AQ	8/22/99	8/24/99	8/25/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	150	ug/L	2.0	20	10
2-METHYLNAPHTHALENE	180	ug/L	2.0	20	10
ACENAPHTHYLENE	<20	ug/L	2.0	20	10
ACENAPHTHENE	<20	ug/L	2.0	20	10
FLUORENE	<20	ug/L	2.0	20	10
PHENANTHRENE	<20	ug/L	2.0	20	10
ANTHRACENE	<20	ug/L	2.0	20	10
FLUORANTHENE	<20	ug/L	2.0	20	10
PYRENE	<20	ug/L	2.0	20	10
BENZO[A]ANTHRACENE	<20	ug/L	2.0	20	10
CHRYSENE	<20	ug/L	2.0	20	10
BENZO[B]FLUORANTHENE	<20	ug/L	2.0	20	10
BENZO[K]FLUORANTHENE	<20	ug/L	2.0	20	10
BENZO[A]PYRENE	<20	ug/L	2.0	20	10
INDENO[1,2,3-CD]PYRENE	<20	ug/L	2.0	20	10
DIBENZ[A,H]ANTHRACENE	<20	ug/L	2.0	20	10
BENZO[G,H,I]PERYLENE	<20	ug/L	2.0	20	10
NITROBENZENE-D5	60	%	2.0		
2-FLUOROBIPHENYL	64	%	2.0		
TERPHENYL-D14	79	%	2.0		

Report Notes: O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-20
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0101	AQ	8/22/99	8/24/99	8/27/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	38	ug/L	1.0	5	5
NAPHTHALENE	E260	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	29	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	91	%	1.0		
1,2-DICHLOROETHANE-D4	86	%	1.0		
TOLUENE-D8	105	%	1.0		
P-BROMOFLUOROBENZENE	102	%	1.0		

Report Notes: E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-20DL
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0101	AQ	8/22/99	8/24/99	8/28/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<10	ug/L	2.0	10	5
TOLUENE	<10	ug/L	2.0	10	5
1,2-DIBROMOETHANE	<10	ug/L	2.0	10	5
ETHYLBENZENE	34	ug/L	2.0	10	5
NAPHTHALENE	290	ug/L	2.0	10	5
MTBE	<10	ug/L	2.0	10	5
TOTAL XYLENES	26	ug/L	2.0	10	5
DIBROMOFLUOROMETHANE	94	%	2.0		
1,2-DICHLOROETHANE-D4	91	%	2.0		
TOLUENE-D8	103	%	2.0		
P-BROMOFLUOROBENZENE	105	%	2.0		

Report Notes: O-2

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3703-21
Report Date: 10/01/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30GLM0501	Aqueous	CLIENT	08/22/99	08/24/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N	0.79	mg/L	1.0	0.050	353.2	08/24/99	CF	
Sulfate (as SO4)	33.	mg/L	2.0	1.0	E300	09/17/99	CF	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/01/99

LJO/baeajc(dw)/msm
PH24NOW1
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-21
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/9/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0501	AQ	8/22/99	8/24/99	8/25/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	70	%	1.0		
2-FLUOROBIPHENYL	71	%	1.0		
TERPHENYL-D14	83	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3703-21
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30GLM0501	AQ	8/22/99	8/24/99	8/28/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	J4	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	94	%	1.0		
1,2-DICHLOROETHANE-D4	93	%	1.0		
TOLUENE-D8	105	%	1.0		
P-BROMOFLUOROBENZENE	108	%	1.0		

Report Notes: J

Katahdin Analytical Services, Inc
Quality Control Report

Duplicate and Matrix Spike/Matrix Spike Duplicate Results

Client:	Tetra Tech NUS
Work Order:	WP3703

			DUPLICATE RESULTS					*MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS*									
			Sample Measurements				Acceptance		Concentration or Quantity				Matrix Spike Recovery (%)				
Parameter	Katahdin Sample No	Units	Rep 1	Rep 2	Mean Conc	RPD (%)	Range for RPD (%)	Units	Sampl Only	Spike Added	Sample +Spike Dup 1	Sample +Spike Dup 2	Sample +Spike Dup 1	Sample +Spike Dup 2	Acceptance Range (%)	RPD (%)	Acceptance Range (%)
Nitrate - N	WP3703-21	mg/L	0.793	0.787	0.790	0.8	0-20	mg/L	0.79	1.0	1.77		98.0		75-125		0-20
TS	WP3703-23	wt%	79.251	78.554	78.903	0.9	0-20	MS/MSD Not Applicable for this Parameter									
TS	WP3703-24	wt%	82.140	81.710	81.925	0.5	0-20	MS/MSD Not Applicable for this Parameter									
TS	WP3703-27	wt%	87.074	85.189	86.132	2.2	0-20	MS/MSD Not Applicable for this Parameter									

RPD = Relative percent difference, which is the absolute value of the difference between two replicate results divided by the mean concentration then multiplied by 100%.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory or contract specified acceptance range except as noted. The laboratory does not use the sample duplicate and matrix spike acceptance ranges as acceptance criteria for a specific analysis. Sample duplicate and matrix spike data are used to evaluate method performance in the environmental sample matrix only. Please refer to LCS data for assessment of quality control for each parameter.

Katahdin Analytical Services, Inc.
Quality Control Report

Method Blank and Laboratory Control Sample Results

Client:	Tetra Tech NUS
Work Order:	WP3703

			METHOD BLANK RESULTS						LABORATORY CONTROL SAMPLE RESULTS					
Parameter	Date of Prep	Date of Analysis	Units		Concentration Measured in Blank		Acceptance Range	Practical Quantitation Level**	Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
Nitrate-Nitrogen	24-Aug-99	24-Aug-99	mg/L	<	0.050	<	0.050	0.050	mg/L	1.00	0.944	94.4	80-120	
Sulfate	17-Sep-99	17-Sep-99	mg/L	<	1.0	<	1.0	1.0	mg/L	10	9.72	97.2	80-120	
TS -Total Residue	24-Aug-99	25-Aug-99	wt %	<	0.10	<	0.10	0.10	wt %	90	89.9	99.9	80-120	
	25-Aug-99	26-Aug-99	wt %	<	0.10	<	0.10	0.10	wt %	90	89.9	99.9	80-120	
	27-Aug-99	30-Aug-99	wt %	<	0.10	<	0.10	0.10					80-120	

** Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK1;082599

Lab Name: Katahdin Analytical Services SDG No.: WP3703

Lab File ID: Z1964 Lab Sample ID: SBLK1;082599

Instrument ID: 5972-Z Date Extracted: 8/25/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 09/07/99

Matrix: (soil/water) WATER Time Analyzed: 14:09

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;082599	LCS;082599	Z1965	9/7/99	2:58:00 PM
26GLM0801	WP3703-1	Z1966	9/7/99	3:47:00 PM
26GLM10D01	WP3703-2	Z1967	9/7/99	4:36:00 PM
26GLM10D01MS	WP3703-2MS	Z1968	9/7/99	5:24:00 PM
26GLM10D01MSD	WP3703-2MSD	Z1969	9/7/99	6:12:00 PM
26GLM0401	WP3703-3	Z1970	9/7/99	7:00:00 PM
26GLM0601	WP3703-4	Z1971	9/7/99	7:51:00 PM
26GLM0501	WP3703-5	Z1972	9/7/99	8:39:00 PM
26GLM0701	WP3703-6	Z1973	9/7/99	9:29:00 PM
26GLM0701D	WP3703-7	Z1974	9/7/99	10:17:00 PM
13GLM0601	WP3703-8	Z1975	9/7/99	11:05:00 PM
32GLM0601	WP3703-9	Z1976	9/7/99	11:55:00 PM
21GLM0301	WP3703-10	Z1977	9/8/99	12:43:00 AM
21GLM0201D	WP3703-12	Z1990	9/8/99	9:34:00 AM
21GLM07D01	WP3703-13	Z1991	9/8/99	10:21:00 AM
26GLM09D01	WP3703-15	Z1992	9/8/99	11:10:00 AM
26GLM0301	WP3703-16	Z1993	9/8/99	11:59:00 AM
30GLM0301	WP3703-18	Z2010	9/9/99	2:01:00 PM
21GLM07D01	WP3703-13RA	Z2011	9/9/99	2:48:00 PM
30GLM0701	WP3703-19	Z2015	9/9/99	5:59:00 PM
30GLM0101	WP3703-20	Z2016	9/9/99	6:48:00 PM
30GLM0501	WP3703-21	Z2017	9/9/99	7:35:00 PM
21GLM0201	WP3703-11	Z2030	9/10/99	2:03:00 PM
30GLM0101	WP3703-20DL	Z2040	9/13/99	10:29:00 AM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK1;082599
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/7/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK1;082599	AQ	-	-	8/25/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	68	%	1.0		
2-FLUOROBIPHENYL	69	%	1.0		
TERPHENYL-D14	86	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: Z1909 **Sample ID: LCS1;082599** **Date Run: 8/31/99**

Analyst: KRT **Time Injected 5:19:00 PM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1530	92	60-140
ACENAPHTHENE	1667	1630	98	60-140
ACENAPHTHYLENE	1667	1600	96	60-140
ANTHRACENE	1667	1710	102	60-140
BENZO[A]ANTHRACENE	1667	1780	107	60-140
BENZO[A]PYRENE	1667	1750	105	60-140
BENZO[B]FLUORANTHENE	1667	1700	102	60-140
BENZO[G,H,I]PERYLENE	1667	1660	100	60-140
BENZO[K]FLUORANTHENE	1667	1930	116	60-140
CHRYSENE	1667	1930	116	60-140
DIBENZ[A,H]ANTHRACENE	1667	1800	108	60-140
FLUORANTHENE	1667	1790	107	60-140
FLUORENE	1667	1700	102	60-140
INDENO[1,2,3-CD]PYRENE	1667	1820	109	60-140
NAPHTHALENE	1667	1560	94	60-140
PHENANTHRENE	1667	1800	108	60-140
PYRENE	1667	1770	106	60-140

*** Out of Limits** *1*

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3703-2	Z1967	9/7/99	4:36:00 PM	KRT	AQ	8270_99
WP3703-2MS	Z1968	9/7/99	5:24:00 PM	KRT	AQ	8270_99
WP3703-2MSD	Z1969	9/7/99	6:12:00 PM	KRT	AQ	8270_99

Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
BENZO[G,H,I]PERYLENE	0	49	49	56.6	56.0	115	114	60-140	1.1	30
2-METHYLNAPHTHALENE	0	49	49	42.9	42.2	87	86	60-140	1.6	30
NAPHTHALENE	0	49	49	40.3	41.4	82	84	60-140	2.7	30
INDENO[1,2,3-CD]PYRENE	0	49	49	59.8	59.1	122	120	60-140	1.2	30
FLUORENE	0	49	49	47.2	43.1	96	88	60-140	9.1	30
FLUORANTHENE	0	49	49	46.7	43.3	95	88	60-140	7.6	30
DIBENZ[A,H]ANTHRACENE	0	49	49	52.8	52.3	108	107	60-140	0.95	30
PHENANTHRENE	0	49	49	47.8	46.9	97	96	60-140	1.9	30
BENZO[K]FLUORANTHENE	0	49	49	52.8	51.8	108	106	60-140	1.9	30
PYRENE	0	49	49	53.8	54.8	110	112	60-140	1.8	30
BENZO[B]FLUORANTHENE	0	49	49	40.7	40.0	83	82	60-140	1.7	30
BENZO[A]PYRENE	0	49	49	46.5	45.8	95	93	60-140	1.5	30
BENZO[A]ANTHRACENE	0	49	49	47.0	46.6	96	95	60-140	0.85	30
ANTHRACENE	0	49	49	46.6	45.1	95	92	60-140	3.3	30
ACENAPHTHYLENE	0	49	49	45.9	42.2	94	86	60-140	8.4	30
ACENAPHTHENE	0	49	49	45.8	42.3	94	86	60-140	7.9	30
CHRYSENE	0	49	49	53.2	52.6	108	107	60-140	1.1	30

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ26A

Lab Name: Katahdin Analytical Services SDG No.: WP3703

Lab File ID: Q6490 Lab Sample ID: VBLKQ26A

Date Analyzed: 08/26/99 Time Analyzed: 10:57

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ26A	LCSQ26A	Q6489	8/26/99	10:10:00 AM
21GLM0301	WP3703-10	Q6495	8/26/99	2:31:00 PM
21GLM0201	WP3703-11	Q6496	8/26/99	3:10:00 PM
21GLM0201D	WP3703-12	Q6497	8/26/99	3:48:00 PM
21GLM07D01	WP3703-13	Q6498	8/26/99	4:27:00 PM
21GLM0801	WP3703-14	Q6499	8/26/99	5:06:00 PM
26GLM09D01	WP3703-15	Q6500	8/26/99	5:45:00 PM
26GLM0301	WP3703-16	Q6501	8/26/99	6:24:00 PM
26GLM0201	WP3703-17	Q6502	8/26/99	7:03:00 PM
30GLM0301	WP3703-18	Q6503	8/26/99	7:42:00 PM
30GLM0701	WP3703-19	Q6504	8/26/99	8:21:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ26A
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ26A	AQ	-	-	8/26/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	94	%	1.0		
1,2-DICHLOROETHANE-D4	90	%	1.0		
TOLUENE-D8	101	%	1.0		
P-BROMOFLUOROBENZENE	106	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6489 **Sample ID: LCSQ26A** **Date Run: 8/26/99**

Analyst: HMP **Time Injected 10:10:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	53.1	106	60-140
BENZENE	50	49.9	100	60-140
ETHYLBENZENE	50	54.8	110	60-140
MTBE	50	38.8	78	60-140
NAPHTHALENE	50	43.3	86	60-140
TOLUENE	50	51.8	104	60-140
TOTAL XYLENES	150	153	102	60-140

*** Out of Limits** *1*

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ27A

Lab Name: Katahdin Analytical Services SDG No.: WP3703

Lab File ID: Q6507 Lab Sample ID: VBLKQ27A

Date Analyzed: 08/27/99 Time Analyzed: 11:21

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ27A	LCSQ27A	Q6506	8/27/99	10:32:00 AM
30GLM0101	WP3703-20	Q6508	8/27/99	12:15:00 PM
26TL00101	WP3703-22	Q6510	8/27/99	1:32:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ27A
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ27A	AQ	-	-	8/27/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	93	%	1.0		
1,2-DICHLOROETHANE-D4	94	%	1.0		
TOLUENE-D8	103	%	1.0		
P-BROMOFLUOROBENZENE	101	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6506 **Sample ID: LCSQ27A** **Date Run: 8/27/99**

Analyst: HMP **Time Injected 10:32:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	47.7	95	60-140
BENZENE	50	46.3	92	60-140
ETHYLBENZENE	50	47.3	94	60-140
MTBE	50	38.2	76	60-140
NAPHTHALENE	50	39.3	78	60-140
TOLUENE	50	46.4	93	60-140
TOTAL XYLENES	150	133	89	60-140

*** Out of Limits** *1*

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ28A

Lab Name: Katahdin Analytical Services SDG No.: WP3703

Lab File ID: Q6526 Lab Sample ID: VBLKQ28A

Date Analyzed: 08/28/99 Time Analyzed: 12:45

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ28C	LCSQ28C	Q6525	8/28/99	11:56:00 AM
30GLM0101	WP3703-20DL	Q6527	8/28/99	1:39:00 PM
30GLM0501	WP3703-21	Q6528	8/28/99	2:18:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ28A
SDG: WP3703
Report Date: 9/24/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ28A	AQ	-	-	8/28/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	95	%	1.0		
1,2-DICHLOROETHANE-D4	93	%	1.0		
TOLUENE-D8	102	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6525 **Sample ID: LCSQ28C** **Date Run: 8/28/99**

Analyst: HMP **Time Injected 11:56:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	49.4	99	60-140
BENZENE	50	52.8	106	60-140
ETHYLBENZENE	50	49.5	99	60-140
MTBE	50	39.8	80	60-140
NAPHTHALENE	50	31.4	63	60-140
TOLUENE	50	53.7	107	60-140
TOTAL XYLENES	150	138	92	60-140

*** Out of Limits** *1*

ENSR
Air Toxics Specialty Laboratory
42 Nagog Park
Acton, MA 01720

DATE: September 13, 1999

TO: Andrea Colby
Katahdin Analytical
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098

Re: Organic Analyses of Aqueous Samples by Gas Chromatography Flame Ionization Detection (GC/FID)- **WP3703**

PROJECT #: **8601-008-200**

LAB ID #: **990159**

ANALYTICAL PROCEDURE:

Two (2) aqueous samples were analyzed under the guidelines of EPA SW846 Method 3810.

A Hewlett Packard 5890 series II gas chromatograph (GC) equipped with a Hewlett Packard flame ionization detector (FID) was used for the analysis. A 1.0 mL headspace aliquot of each sample was injected into the column for analysis. The operating conditions of the GC/FID are listed in Table 1. A five point calibration was performed for the target analytes (methane, ethane, and ethylene).

No problems occurred during sample receipt or log-in.

QUALITY CONTROL:

1. A laboratory blank was analyzed daily in the same manner as the samples. Target analytes were not detected in the blank.

2. A MS/MSD was performed on a sample from another Katahdin job: WP3680-6

   All recoveries were within QC limits.

Date Samples Received by the Laboratory: 8/25/99

Date Analysis Started: 8/30/99

C:\My Documents\katrpt20.doc

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: _____ ENSR _____ Contract: _____ WP3703-20(C)

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990159-1

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTD__019_____

Level: (low/med) _____ low _____ Date Received:___8/25/99 _____

% Moisture: _____ NA _____ Date Analyzed:__8/30/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	6300	E
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3703-20(C) D

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990159-1 DIL

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTD__022_____

Level: (low/med) _____ low _____ Date Received:___8/25/99 _____

% Moisture: _____ NA _____ Date Analyzed:___8/30/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	9200	D
74-85-1	Ethene	90	U
74-84-0	Ethane	96	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3703-21(A)

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990159-2

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTD__020_____

Level: (low/med) _____ low _____ Date Received:___8/25/99 _____

% Moisture: _____ NA _____ Date Analyzed:___8/30/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	6.9	
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: _____ ENSR _____ Contract: _____ VBLK01

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: MB990154

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTD__002_____

Level: (low/med) _____ low _____ Date Received:___NA _____

% Moisture: _____ NA _____ Date Analyzed:___8/30/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	5.2	U
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: _____ ENSR _____ Contract: _____ LCS01

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: LCS990154

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTD__003_____

Level: (low/med) _____ low _____ Date Received:___NA _____

% Moisture: _____ NA _____ Date Analyzed:__8/30/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1_____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	200	
74-85-1	Ethene	410	
74-84-0	Ethane	450	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: _____ ENSR _____ Contract: _____ WP3680-6 MS

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990157-6 MS

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTD__017_____

Level: (low/med) _____ low _____ Date Received:___8/20/99 _____

% Moisture: _____ NA _____ Date Analyzed:__8/30/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1_____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	250	
74-85-1	Ethene	380	
74-84-0	Ethane	410	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3680-6 MSD

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990157-6 MSD

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KTD__018_____

Level: (low/med) _____ low _____ Date Received:___8/20/99 _____

% Moisture: _____ NA _____ Date Analyzed:___8/30/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____1_____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	260	
74-85-1	Ethene	380	
74-84-0	Ethane	410	

LABORATORY CONTROL SPIKE RECOVERY

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case NO.: _____ SAS NO.: _____ SDG NO.: _____

Laboratory Control Sample No: _____ LCS01 _____

COMPOUND	SPIKE ADDED (µg/L)	LCS CONCENTRATION (µg/L)	LCS % REC #	QC LIMITS REC.
Methane	205.0	204.1	100%	50 - 150
Ethene	362.4	407.8	113%	50 - 150
Ethane	388.4	445.4	115%	50 - 150

* - Values outside of QC limits.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case NO.: _____ SAS NO.: _____ SDG NO.: _____

Matrix Spike - EPA Sample NO.: __WP3680-6 _____

COMPOUND	SPIKE ADDED (µg/L)	SAMPLE CONCENTRATION (µg/L)	MS CONCENTRATION (µg/L)	MS % REC #	QC LIMITS REC.
Methane	205.0	68	249.5	89%	50-150
Ethene	362.4	0	377.0	104%	50-150
Ethane	388.4	0	408.8	105%	50-150

COMPOUND	SPIKE ADDED (µg/L)	MSD CONCENTRATION (µg/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Methane	205.0	257.8	93%	4.4%	50	50-150
Ethene	362.4	381.7	105%	1.2%	50	50-150
Ethane	388.4	413.4	106%	1.1%	50	50-150

Spike recovery: _____ 0 _____ out of ____ 6 ___ outside limits.
RPD: _____ 0 ____ out of ___ 3 ____ outside limits.

Comments:

METHOD BLANK SUMMARY

EPA SAMPLE NO.

Lab Name: _____ ENSR _____ Contract: _____ VBLK01

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Lab File ID: __KTD__002_____ Lab Sample I MB990154

Instrument ID: _____ HPGC#3_____ Date Analyzed:_8/30/99_____

Matrix: (soil/water) _____ water _____ Level: (low/med) _____ low _____

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES; MS AND MSD

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	LCS01	LCS990154	KTD_003	08/30/99
02	WP3680-6 MS	990157-6 MS	KTD_017	08/30/99
03	WP3680-6 MSD	990157-6 MSD	KTD_018	08/30/99
04	WP3703-20(C)	990159-1	KTD_019	08/30/99
05	WP3703-20(C)D	990159-1DIL	KTD_022	08/30/99
06	WP3703-21(A)	990159-2	KTD_020	08/30/99
07				
08				
09				
10				
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26				

COMMENTS:

Katahdin
ANALYTICAL SERVICES

August 19, 1999

Mr. Paul Calligan
Tetra Tech NUS
1401 Oven Park Drive, Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP-3079
Project ID: CNC Charleston
Project Manager: Ms. Andrea J. Colby
Sample Receipt Date: June 29, 1999

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Confirmation
* Chain of Custody

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Maria Crouch
Authorized Signature

08/19/99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on June 29, 1999 and were logged in under Katahdin Analytical Services work order number WP3079 for a hardcopy due date of July 29, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample No.
WP3079-1	30SLB050708	
WP3079-2	26SLB010405	9906925-06
WP3079-3	30SLB140304	9906925-03
WP3079-4	26SLB030304	9906925-08
WP3079-5	30SLB010708	
WP3079-6	30SLB160708	
WP3079-7	30SLB170910	9906925-04
WP3079-8	30SLB170910D	9906925-05
WP3079-9	26SLB260607	
WP3079-10	26SLB220304	
WP3079-11	26SLB120304	
WP3079-12	26SLB010405D	9906925-07
WP3079-13	26TL00101	
WP3079-14	30SLB140304D	9906925-02
WP3079-15	26SLB030304D	9906925-09

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

One aqueous and twelve soil samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on June 29, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5972-M (aqueous and medium level soil) and 5972-F (low level soil) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. A matrix spike/matrix spike duplicate pair was analyzed on sample WP3079-3 (low level soil).

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Method 8260B narrows this 20% maximum to 15%.

Three initial calibration curves are reported in this workorder. All three calibrations had several analytes exceeding the maximum allowable 15% RSD. Since the average %RSD values were 8.5%, 14.7%, and 6.5%, respectively, the curves were acceptable.

Initial analyses of samples WP3079-2, -3, -5, -9, 10, -11, and -12 yielded surrogate recovery deviations and/or internal standard area recovery deviations. Reanalyses yielded similar results, confirming matrix interference. Both sets of data are included in the data package for each sample.

Analysis of sample WP3079-7 was performed following medium level protocols due to the matrix and target analyte concentrations, with target analyte concentrations still over the upper limit of the calibration curve. Reanalysis of the medium level extract occurred at a 1:5 dilution successfully. Both sets of data are included in this data package.

Analysis of the QC sample WP3079-3MS yielded both internal standard and surrogate recovery deviations. In accordance with the method, no laboratory action was taken with this QC sample.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Twelve soil/sediment samples were received by Katahdin Analytical Services laboratory on June 29, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the samples occurred following USEPA method 3510 on June 30, 1999. A laboratory control spike consisting of all PAH analytes spiked into organic free sand, was extracted in the batch, along with a site specific matrix spike/matrix spike duplicate pair on sample WP3079-3.

The initial calibration curve analyzed in this SDG had some of the target analyte %RSD values exceeding 15 %.

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Section 7.3.7.1 of method 8270C (revision 3, 12/96) narrows this 20% maximum to 15%.

In the calibration curve analyzed in this SDG, the average %RSD for all analytes was 10.1%, making the curve acceptable.

Analyses of samples WP3079-7 and -10 were performed at 1:25 and 1:10 dilutions, respectively, due to extract viscosity and target analyte concentrations, resulting in elevated reporting limits.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Wet Chemistry Analysis

For work order WP3079 the analyses for Total Combustible Organics (TCO) have been performed in accordance with the "Annual Book of ASTM Standards", 1987. Analyses for Solids-Total Residue (TS) for work order WP3079 samples have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All analyses were performed within analytical hold time. No protocol deviations were noted by the Wet Chemistry laboratory staff.

Subcontracted Analysis

Analyses for Total Organic Carbon, Total Petroleum Hydrocarbons, and Grain size were subcontracted to outside laboratories.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP 3079

PAGE: 1 OF 2

COOLER: 1 OF 2

COC#: –

SDG#: –

DATE / TIME RECEIVED: 6-29-99 0945

DELIVERED BY: Fed Ex

RECEIVED BY: Sm

LIMS ENTRY BY: BKW

LIMS REVIEW BY / PM: KDC

CLIENT: Tetra Tech -SC

PROJECT: CNC Charleston

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☐	☑	☐	TEMP BLANK TEMP (°C)=	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= 4.2 NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000080

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3079

PAGE: 2 OF 2

COOLER: 2 OF 2

COC# —
SDG# —
DATE / TIME RECEIVED: 062999 0945
DELIVERED BY: FEDEX
RECEIVED BY: SAW
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

CLIENT: Tetra Tech

PROJECT: CNC Charleston

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☐	☑	☐	TEMP BLANK TEMP (°C)=	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or (N?)	☐	☑	☐	COOLER TEMP (°C)= 22.0 NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	Only grain size in this container - temp not an issue
7. VOLATILES FREE OF HEADSPACE?	☐	☐	☑	NA	
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☐	☑	↓	
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

00000081

Katahdin
ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of ____

Client: TetraTech NUS
Contact: Bryan Howze
Phone #: ( )
Fax #: ( )
Address: N421 Ave H
City: N. Charleston
State: SC
Zip Code: 29405
Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign): Roger Franklin
Copies To:

LAB USE ONLY
WORK ORDER #: WP3079
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☑ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO: 8134029 04657
TEMP°C _____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX/EDB	PAH	POC	Grain size						FID
	30SLB0107 08	6/28 / 0850	S	5	X	X								0
	30SLB05070 8	6/28 / 0915	"	6	X	X		X						0
	30SLB14 05070 4	6/28 / 1040	"	5	X	X	X	X						0
	30SLB14 05030 4 MS	6/28 / —	"	5	X	X	X			MS/MSD				0
	30SLB16 0708	6/28 / 0950	"	5	X	X								0
	30SLB17 0910	6/28/ 1140	"	5	X	X								0
	30SLB17 0910 D	6/28/ —	"	5	X	X								0
	~~30SLB01 0708~~	~~10 OA~~	~~"~~											0
	26SLB26 0607	6/28 / 1625	"	5	X	X								0
	26SLB22 0304	6/28 / 1610	"	5	X	X								0
	26SLB12 0304	6/28 / 1610	"	5	X	X								0
	26SLB03 0304	6/28 / 1450	"	5	X	X	X							0
	26SLB01 0405	6/28 / 1435	"	6	X	X		X						0
	26SLB01 0405 D	6/28 / 1435	"	5	X	X								0
	26TLB01 01	6/28/ —	H_2O	2	X									0
		/												

COMMENTS
FID readings suspect.

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
R. Franklin	6/29/99 1500	8134029 04657		06/29/99 0945	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3079

Project Manager: Andrea J. Colby
ORDER DATE: 06/29/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 29 JUL
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: R.FRANKLIN DELIVERED BY: FEDEX DISPOSE: AFTER 28 AUG

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3079-1	30SLB050708	28 JUN 0915	29 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Wet Lab Subcontract		1	110.00	110.00
TOTALS		1	330.00	330.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3079-3	30SLB140304	28 JUN 1040	29 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Total Combustible Organics	ASTM D2974	1	30.00	30.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Wet Lab Subcontract		1	135.00	135.00
TOTALS		1	385.00	385.00

LABORATORY ORDER CONTINUED ON PAGE 2

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3079

Project Manager: Andrea J. Colby
ORDER DATE: 06/29/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 29 JUL
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: R.FRANKLIN DELIVERED BY: FEDEX DISPOSE: AFTER 28 AUG

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3079-5	30SLB010708	28 JUN 0850	29 JUN	SL
	WP3079-6	30SLB160708	28 JUN 0950		
	WP3079-9	26SLB260607	28 JUN 1625		
	WP3079-10	26SLB220304	28 JUN 1610		
	WP3079-11	26SLB120304	28 JUN 1610		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	5	85.00	425.00
Solids-Total Residue (TS)	CLP/CIP SO	5	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	5	135.00	675.00
TOTALS		5	220.00	1100.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3079-13	26TL00101	28 JUN	29 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP3079-14	30SLB140304D	28 JUN 1040	28 JUN	SL
	WP3079-15	26SLB030304D	28 JUN 1450		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Wet Lab Subcontract		2	60.00	120.00

LABORATORY ORDER CONTINUED ON PAGE 3

09/07/99

ORDER NO WP-3079

Project Manager: Andrea J. Colby
ORDER DATE: 06/29/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 29 JUL
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: R.FRANKLIN DELIVERED BY: FEDEX DISPOSE: AFTER 28 AUG

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP3079-2	26SLB010405	28 JUN 1435	29 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Wet Lab Subcontract		1	185.00	185.00
TOTALS		1	405.00	405.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
7	WP3079-4	26SLB030304	28 JUN 1450	29 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Total Combustible Organics	ASTM D2974	1	30.00	30.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Wet Lab Subcontract		1	60.00	60.00
TOTALS		1	310.00	310.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
8	WP3079-7	30SLB170910	28 JUN 1100	29 JUN	SL
	WP3079-8	30SLB170910D	28 JUN		
	WP3079-12	26SLB010405D	28 JUN 1435		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	85.00	255.00
Solids-Total Residue (TS)	CLP/CIP SO	3	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	135.00	405.00
Wet Lab Subcontract		3	75.00	225.00
TOTALS		3	295.00	885.00

LABORATORY ORDER CONTINUED ON PAGE 4

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3079

Project Manager: Andrea J. Colby
ORDER DATE: 06/29/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 29 JUL
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: R.FRANKLIN DELIVERED BY: FEDEX DISPOSE: AFTER 28 AUG

ORDER NOTE: QC-IV NFESC-D
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA 15220
REPORT & DISK

FINAL PAGE

INVOICE: With Report

TOTAL ORDER AMOUNT $3,620.00
This is NOT an Invoice

AJC/BKR/WEST.AJC(dw)
07-02Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
DL	'DL' flag denotes inability to calculate surrogate recovery due to sample dilution.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-1	Sample dilution required due to matrix interference, sample viscosity or other matrix-related problem; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
$	'$' flag denotes surrogate compound recovery is out of criteria. Re-extraction or re-analysis confirmed matrix interference.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-1	Sample dilution required due to matrix interference, sample viscosity or other matrix-related problem; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.
O-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3079-1
Report Date: 08/19/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB050708	Solid	R.FRANKLIN	06/28/99	06/29/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	93.	wt %	1.0	0.10	CLP/CIP SOW	06/30/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/29/99 by JF

08/19/99

LJO/baeajc(dw)/msm
PF29TSS6
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-1
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 93
Method: EPA 8270
Date Analyzed: 7/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB050708	SL	6/28/99	6/29/99	6/30/99	GST	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<360	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	<360	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	<360	ug/Kg	1.1	360	330
PHENANTHRENE	<360	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	<360	ug/Kg	1.1	360	330
BENZO[A]ANTHRACENE	<360	ug/Kg	1.1	360	330
CHRYSENE	<360	ug/Kg	1.1	360	330
BENZO[B]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[K]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[A]PYRENE	<360	ug/Kg	1.1	360	330
INDENO[1,2,3-CD]PYRENE	<360	ug/Kg	1.1	360	330
DIBENZ[A,H]ANTHRACENE	<360	ug/Kg	1.1	360	330
BENZO[G,H,I]PERYLENE	<360	ug/Kg	1.1	360	330
NITROBENZENE-D5	56	%	1.1		
2-FLUOROBIPHENYL	56	%	1.1		
TERPHENYL-D14	82	%	1.1		

Report Notes:

0000008

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-1
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 93
Method: SW8260
Date Analyzed: 6/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB050708	SL	6/28/99	6/29/99	6/29/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	<6	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	107	%	1.2		
1,2-DICHLOROETHANE-D4	116	%	1.2		
TOLUENE-D8	107	%	1.2		
P-BROMOFLUOROBENZENE	126	%	1.2		

Report Notes:

0000009

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3079-3
Report Date: 08/19/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB140304	Solid	R.FRANKLIN	06/28/99	06/29/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	92.	wt %	1.0	0.10	CLP/CIP SOW	06/30/99	JF	1
Total Combustible Organics	2.7	wt %	1.0	0.1	ASTM D2974-8	06/30/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/29/99 by JF

08/19/99

LJO/baeajc(dw)/msm
PF29VSS7
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-3
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: EPA 8270
Date Analyzed: 7/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB140304	SL	6/28/99	6/29/99	6/30/99	GST	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<360	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	<360	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	<360	ug/Kg	1.1	360	330
PHENANTHRENE	<360	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	<360	ug/Kg	1.1	360	330
BENZO[A]ANTHRACENE	<360	ug/Kg	1.1	360	330
CHRYSENE	<360	ug/Kg	1.1	360	330
BENZO[B]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[K]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[A]PYRENE	<360	ug/Kg	1.1	360	330
INDENO[1,2,3-CD]PYRENE	<360	ug/Kg	1.1	360	330
DIBENZ[A,H]ANTHRACENE	<360	ug/Kg	1.1	360	330
BENZO[G,H,I]PERYLENE	<360	ug/Kg	1.1	360	330
NITROBENZENE-D5	54	%	1.1		
2-FLUOROBIPHENYL	54	%	1.1		
TERPHENYL-D14	67	%	1.1		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-3
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: SW8260
Date Analyzed: 6/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB140304	SL	6/28/99	6/29/99	6/29/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<7	ug/Kg	1.5	7	5
TOLUENE	<7	ug/Kg	1.5	7	5
1,2-DIBROMOETHANE	<7	ug/Kg	1.5	7	5
ETHYLBENZENE	<7	ug/Kg	1.5	7	5
NAPHTHALENE	<7	ug/Kg	1.5	7	5
MTBE	<7	ug/Kg	1.5	7	5
TOTAL XYLENES	<7	ug/Kg	1.5	7	5
DIBROMOFLUOROMETHANE	84	%	1.5		
1,2-DICHLOROETHANE-D4	93	%	1.5		
TOLUENE-D8	69	%	1.5		
P-BROMOFLUOROBENZENE	$40	%	1.5		

Report Notes: $

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-3RE
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: SW8260
Date Analyzed; 6/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB140304	SL	6/28/99	6/29/99	6/30/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.3	6	5
TOLUENE	<6	ug/Kg	1.3	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.3	6	5
ETHYLBENZENE	<6	ug/Kg	1.3	6	5
NAPHTHALENE	<6	ug/Kg	1.3	6	5
MTBE	<6	ug/Kg	1.3	6	5
TOTAL XYLENES	<6	ug/Kg	1.3	6	5
DIBROMOFLUOROMETHANE	90	%	1.3		
1,2-DICHLOROETHANE-D4	100	%	1.3		
TOLUENE-D8	$66	%	1.3		
P-BROMOFLUOROBENZENE	$36	%	1.3		

Report Notes: $

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3079-5
Report Date: 08/19/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB010708	Solid	R.FRANKLIN	06/28/99	06/29/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	92.	wt %	1.0	0.10	CLP/CIP SOW	06/30/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/29/99 by JF

08/19/99

LJO/baeajc(dw)/msm
PF29TSS6
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-5
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: EPA 8270
Date Analyzed: 7/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB010708	SL	6/28/99	6/29/99	6/30/99	GST	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<360	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	<360	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	<360	ug/Kg	1.1	360	330
PHENANTHRENE	<360	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	J240	ug/Kg	1.1	360	330
BENZO[A]ANTHRACENE	<360	ug/Kg	1.1	360	330
CHRYSENE	<360	ug/Kg	1.1	360	330
BENZO[B]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[K]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[A]PYRENE	<360	ug/Kg	1.1	360	330
INDENO[1,2,3-CD]PYRENE	<360	ug/Kg	1.1	360	330
DIBENZ[A,H]ANTHRACENE	<360	ug/Kg	1.1	360	330
BENZO[G,H,I]PERYLENE	<360	ug/Kg	1.1	360	330
NITROBENZENE-D5	77	%	1.1		
2-FLUOROBIPHENYL	63	%	1.1		
TERPHENYL-D14	70	%	1.1		

Report Notes: J

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-5
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: SW8260
Date Analyzed: 6/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB010708	SL	6/28/99	6/29/99	6/29/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.3	6	5
TOLUENE	<6	ug/Kg	1.3	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.3	6	5
ETHYLBENZENE	<6	ug/Kg	1.3	6	5
NAPHTHALENE	13	ug/Kg	1.3	6	5
MTBE	<6	ug/Kg	1.3	6	5
TOTAL XYLENES	<6	ug/Kg	1.3	6	5
DIBROMOFLUOROMETHANE	116	%	1.3		
1,2-DICHLOROETHANE-D4	134	%	1.3		
TOLUENE-D8	96	%	1.3		
P-BROMOFLUOROBENZENE	$48	%	1.3		

Report Notes: $, O-13

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-5RE
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: SW8260
Date Analyzed: 6/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB010708	SL	6/28/99	6/29/99	6/30/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<7	ug/Kg	1.4	7	5
TOLUENE	<7	ug/Kg	1.4	7	5
1,2-DIBROMOETHANE	<7	ug/Kg	1.4	7	5
ETHYLBENZENE	<7	ug/Kg	1.4	7	5
NAPHTHALENE	15	ug/Kg	1.4	7	5
MTBE	<7	ug/Kg	1.4	7	5
TOTAL XYLENES	<7	ug/Kg	1.4	7	5
DIBROMOFLUOROMETHANE	$29	%	1.4		
1,2-DICHLOROETHANE-D4	$62	%	1.4		
TOLUENE-D8	$2	%	1.4		
P-BROMOFLUOROBENZENE	$34	%	1.4		

Report Notes: $, O-13

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3079-6
Report Date: 08/19/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB160708	Solid	R.FRANKLIN	06/28/99	06/29/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	90.	wt %	1.0	0.10	CLP/CIP SOW	06/30/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/29/99 by JF

08/19/99

LJO/baeajc(dw)/msm
PF29TSS6
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-6
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 90
Method: EPA 8270
Date Analyzed: 7/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB160708	SL	6/28/99	6/29/99	6/30/99	GST	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<360	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	<360	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	<360	ug/Kg	1.1	360	330
PHENANTHRENE	<360	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	<360	ug/Kg	1.1	360	330
BENZO[A]ANTHRACENE	<360	ug/Kg	1.1	360	330
CHRYSENE	<360	ug/Kg	1.1	360	330
BENZO[B]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[K]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[A]PYRENE	<360	ug/Kg	1.1	360	330
INDENO[1,2,3-CD]PYRENE	<360	ug/Kg	1.1	360	330
DIBENZ[A,H]ANTHRACENE	<360	ug/Kg	1.1	360	330
BENZO[G,H,I]PERYLENE	<360	ug/Kg	1.1	360	330
NITROBENZENE-D5	57	%	1.1		
2-FLUOROBIPHENYL	58	%	1.1		
TERPHENYL-D14	74	%	1.1		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-6
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 90
Method: SW8260
Date Analyzed: 6/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB160708	SL	6/28/99	6/29/99	6/30/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<7	ug/Kg	1.4	7	5
TOLUENE	<7	ug/Kg	1.4	7	5
1,2-DIBROMOETHANE	<7	ug/Kg	1.4	7	5
ETHYLBENZENE	<7	ug/Kg	1.4	7	5
NAPHTHALENE	<7	ug/Kg	1.4	7	5
MTBE	<7	ug/Kg	1.4	7	5
TOTAL XYLENES	<7	ug/Kg	1.4	7	5
DIBROMOFLUOROMETHANE	114	%	1.4		
1,2-DICHLOROETHANE-D4	124	%	1.4		
TOLUENE-D8	88	%	1.4		
P-BROMOFLUOROBENZENE	87	%	1.4		

Report Notes:

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3079-7
Report Date: 08/19/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB170910	Solid	R.FRANKLIN	06/28/99	06/29/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	92.	wt %	1.0	0.10	CLP/CIP SOW	06/30/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/29/99 by JF

08/19/99

LJO/baeajc(dw)/msm
PF29TSS6
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-8
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 96
Method: EPA 8270
Date Analyzed: 7/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB170910D	SL	6/28/99	6/29/99	6/30/99	GST	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<330	ug/Kg	1.0	330	330
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330
ACENAPHTHENE	<330	ug/Kg	1.0	330	330
FLUORENE	<330	ug/Kg	1.0	330	330
PHENANTHRENE	<330	ug/Kg	1.0	330	330
ANTHRACENE	<330	ug/Kg	1.0	330	330
FLUORANTHENE	<330	ug/Kg	1.0	330	330
PYRENE	<330	ug/Kg	1.0	330	330
BENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330
CHRYSENE	<330	ug/Kg	1.0	330	330
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[A]PYRENE	<330	ug/Kg	1.0	330	330
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330
BENZO[G,H,I]PERYLENE	<330	ug/Kg	1.0	330	330
NITROBENZENE-D5	58	%	1.0		
2-FLUOROBIPHENYL	59	%	1.0		
TERPHENYL-D14	79	%	1.0		

Report Notes:

0000033

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3079-8
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 96
Method: SW8260
Date Analyzed: 6/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB170910D	SL	6/28/99	6/29/99	6/30/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	<6	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	114	%	1.2		
1,2-DICHLOROETHANE-D4	126	%	1.2		
TOLUENE-D8	91	%	1.2		
P-BROMOFLUOROBENZENE	87	%	1.2		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;063099
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: EPA 8270
Date Analyzed: 7/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;063099	SL	-	-	6/30/99	GST	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<330	ug/Kg	1.0	330	330
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330
ACENAPHTHENE	<330	ug/Kg	1.0	330	330
FLUORENE	<330	ug/Kg	1.0	330	330
PHENANTHRENE	<330	ug/Kg	1.0	330	330
ANTHRACENE	<330	ug/Kg	1.0	330	330
FLUORANTHENE	<330	ug/Kg	1.0	330	330
PYRENE	<330	ug/Kg	1.0	330	330
BENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330
CHRYSENE	<330	ug/Kg	1.0	330	330
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[A]PYRENE	<330	ug/Kg	1.0	330	330
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330
BENZO[G,H,I]PERYLENE	<330	ug/Kg	1.0	330	330
NITROBENZENE-D5	59	%	1.0		
2-FLUOROBIPHENYL	60	%	1.0		
TERPHENYL-D14	74	%	1.0		

Report Notes:

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;063099

Lab Name: Katahdin Analytical Services SDG No.: WP3079

Lab File ID: Z1562

Lab Sample ID: SBLK;063099

Instrument ID: 5972-Z

Date Extracted: 6/30/99

GC Column: RTX-624 ID: 0.18 (mm)

Date Analyzed: 07/29/99

Matrix: (soil/water) SOIL

Time Analyzed: 9:28

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
30SLB050708	WP3079-1	Z1563	7/29/99	10:14:00 AM
26SLB010405	WP3079-2	Z1564	7/29/99	11:01:00 AM
26SLB030304	WP3079-4	Z1565	7/29/99	11:48:00 AM
30SLB160708	WP3079-6	Z1566	7/29/99	12:36:00 PM
30SLB170910D	WP3079-8	Z1567	7/29/99	1:21:00 PM
26SLB260607	WP3079-9	Z1568	7/29/99	2:07:00 PM
30SLB140304	WP3079-3	Z1569	7/29/99	2:53:00 PM
30SLB140304MS	WP3079-3MS	Z1570	7/29/99	3:40:00 PM
30SLB140304MSD	WP3079-3MSD	Z1571	7/29/99	4:25:00 PM
30SLB010708	WP3079-5	Z1572	7/29/99	5:13:00 PM
26SLB120304	WP3079-11	Z1586	7/30/99	10:22:00 PM
26SLB010405D	WP3079-12	Z1587	7/30/99	11:09:00 PM
30SLB170910	WP3079-7	Z1588	7/30/99	11:57:00 PM
LCS;063099	LCS;063099	Z1619	8/3/99	7:57:00 PM
26SLB220304	WP3079-10	Z1621	8/3/99	9:31:00 PM

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: Z1619 **Sample ID: LCS;063099** **Date Run: 8/3/99**

Analyst: KRT **Time Injected 7:57:00 PM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1230	74	60-140
ACENAPHTHENE	1667	1240	74	60-140
ACENAPHTHYLENE	1667	1160	70	60-140
ANTHRACENE	1667	1420	85	60-140
BENZO[A]ANTHRACENE	1667	1310	79	60-140
BENZO[A]PYRENE	1667	1250	75	60-140
BENZO[B]FLUORANTHENE	1667	1330	80	60-140
BENZO[G,H,I]PERYLENE	1667	1100	66	60-140
BENZO[K]FLUORANTHENE	1667	1520	91	60-140
CHRYSENE	1667	1400	84	60-140
DIBENZ[A,H]ANTHRACENE	1667	1050	63	60-140
FLUORANTHENE	1667	1410	85	60-140
FLUORENE	1667	1240	75	60-140
INDENO[1,2,3-CD]PYRENE	1667	928	*56	60-140
NAPHTHALENE	1667	1180	71	60-140
PHENANTHRENE	1667	1360	82	60-140
PYRENE	1667	1290	77	60-140

*** Out of Limits** *1*

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3079-3	Z1569	7/29/99	2:53:00 PM	KRT	SL	8270_99
WP3079-3MS	Z1570	7/29/99	3:40:00 PM	KRT	SL	8270_99
WP3079-3MSD	Z1571	7/29/99	4:25:00 PM	KRT	SL	8270_99

Compound Name	Native (ug/Kg)	MS Spk Amount (ug/Kg)	MSD Spk Amount (ug/Kg)	MS Result (ug/Kg)	MSD Result (ug/Kg)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	1820	1820	1260	1200	69	66	60-140	4.9	50
ACENAPHTHENE	0	1820	1820	1150	1080	63	*59	60-140	6.3	50
ACENAPHTHYLENE	0	1820	1820	1100	1010	60	*56	60-140	8.5	50
ANTHRACENE	0	1820	1820	1320	1250	72	69	60-140	5.4	50
BENZO[A]ANTHRACENE	0	1820	1820	1260	1180	69	65	60-140	6.6	50
BENZO[A]PYRENE	0	1820	1820	1140	1070	63	*59	60-140	6.3	50
BENZO[B]FLUORANTHENE	0	1820	1820	1260	1190	69	65	60-140	5.7	50
2-METHYLNAPHTHALENE	0	1820	1820	1140	1030	63	*56	60-140	10	50
BENZO[K]FLUORANTHENE	0	1820	1820	1390	1290	76	71	60-140	7.5	50
PYRENE	0	1820	1820	1340	1250	73	68	60-140	6.9	50
DIBENZ[A,H]ANTHRACENE	0	1820	1820	924	868	*51	*48	60-140	6.2	50
FLUORANTHENE	0	1820	1820	1310	1250	72	69	60-140	4.7	50
FLUORENE	0	1820	1820	1180	1100	65	60	60-140	7.0	50
INDENO[1,2,3-CD]PYRENE	0	1820	1820	708	692	*39	*38	60-140	2.3	50
NAPHTHALENE	0	1820	1820	1100	998	60	*55	60-140	9.7	50
PHENANTHRENE	0	1820	1820	1280	1210	70	67	60-140	5.6	50
BENZO[G,H,I]PERYLENE	0	1820	1820	903	850	*50	*47	60-140	6.0	50

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKF0629B

Lab Name: Katahdin Analytical Services SDG No.: WP3079

Lab File ID: F1143 Lab Sample ID: VBLKF0629B

Date Analyzed: 06/29/99 Time Analyzed: 17:39

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972-F

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSF0629C	LCSF0629C	F1141	6/29/99	4:27:00 PM
30SLB050708	WP3079-1	F1144	6/29/99	6:16:00 PM
30SLB140304	WP3079-3	F1145	6/29/99	6:52:00 PM
30SLB010708	WP3079-5	F1146	6/29/99	7:29:00 PM
26SLB030304	WP3079-4	F1150	6/29/99	9:55:00 PM
26SLB260607	WP3079-9	F1151	6/29/99	10:31:00 PM
26SLB220304	WP3079-10	F1152	6/29/99	11:08:00 PM
26SLB120304	WP3079-11	F1153	6/29/99	11:45:00 PM
26SLB010405D	WP3079-12	F1154	6/30/99	12:21:00 AM

000005A

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKF0629B
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 6/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF0629B	SL	-	-	6/29/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	105	%	1.0		
1,2-DICHLOROETHANE-D4	117	%	1.0		
TOLUENE-D8	109	%	1.0		
P-BROMOFLUOROBENZENE	99	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F1141 **Sample ID: LCSF0629C** **Date Run: 6/29/99**

Analyst: JSS **Time Injected 4:27:00 PM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	60.0	120	60-140
BENZENE	50	54.5	109	60-140
ETHYLBENZENE	50	57.0	114	60-140
MTBE	50	59.8	120	60-140
NAPHTHALENE	50	67.5	135	60-140
TOLUENE	50	54.2	108	60-140
TOTAL XYLENES	150	164	109	60-140

*** Out of Limits** *1*

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKM30B

Lab Name: Katahdin Analytical Services SDG No.: WP3079

Lab File ID: M0846 Lab Sample ID: VBLKM30B

Date Analyzed: 06/30/99 Time Analyzed: 11:05

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5972-M

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSM30A	LCSM30A	M0844	6/30/99	9:23:00 AM
30SLB170910	WP3079-7	M0854	6/30/99	4:57:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKM30B
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 6/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKM30B	AQ	-	-	6/30/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	100	%	1.0		
1,2-DICHLOROETHANE-D4	94	%	1.0		
TOLUENE-D8	102	%	1.0		
P-BROMOFLUOROBENZENE	95	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: M0844 **Sample ID: LCSM30A** **Date Run: 6/30/99**

Analyst: DJP **Time Injected 9:23:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	54.9	110	60-140
BENZENE	50	52.4	105	60-140
ETHYLBENZENE	50	54.6	109	60-140
MTBE	50	54.3	108	60-140
NAPHTHALENE	50	65.5	131	60-140
TOLUENE	50	54.6	109	60-140
TOTAL XYLENES	150	162	108	60-140

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKF30B

Lab Name: Katahdin Analytical Services SDG No.: WP3079

Lab File ID: F1160 Lab Sample ID: VBLKF30B

Date Analyzed: 06/30/99 Time Analyzed: 12:54

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972-F

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSF30A	LCSF30A	F1158	6/30/99	11:20:00 AM
26SLB010405	WP3079-2	F1161	6/30/99	1:50:00 PM
26SLB010405	WP3079-2RE	F1162	6/30/99	2:27:00 PM
30SLB140304	WP3079-3RE	F1163	6/30/99	3:04:00 PM
30SLB140304MS	WP3079-3MS	F1164	6/30/99	3:41:00 PM
30SLB140304MSD	WP3079-3MSD	F1165	6/30/99	4:18:00 PM
30SLB010708	WP3079-5RE	F1167	6/30/99	5:31:00 PM
30SLB160708	WP3079-6	F1168	6/30/99	6:07:00 PM
30SLB170910D	WP3079-8	F1169	6/30/99	6:44:00 PM
26SLB260607	WP3079-9RE	F1170	6/30/99	7:20:00 PM
26SLB220304	WP3079-10RE	F1171	6/30/99	7:57:00 PM
26SLB120304	WP3079-11RE	F1172	6/30/99	8:33:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKF30B
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 6/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF30B	SL	-	-	6/30/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	134	%	1.0		
1,2-DICHLOROETHANE-D4	147	%	1.0		
TOLUENE-D8	116	%	1.0		
P-BROMOFLUOROBENZENE	121	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F1158 **Sample ID: LCSF30A** **Date Run: 6/30/99**

Analyst: JSS **Time Injected 11:20:00 AM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	54.0	108	60-140
BENZENE	50	43.4	87	60-140
ETHYLBENZENE	50	49.4	99	60-140
MTBE	50	59.0	118	60-140
NAPHTHALENE	50	66.1	132	60-140
TOLUENE	50	45.4	91	60-140
TOTAL XYLENES	150	148	98	60-140

*** Out of Limits** *1*

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3079-3	F1145	6/29/99	6:52:00 PM	JSS	SL	8260_99
WP3079-3MS	F1164	6/30/99	3:41:00 PM	JSS	SL	8260_99
WP3079-3MSD	F1165	6/30/99	4:18:00 PM	JSS	SL	8260_99

Compound Name	Native (ug/Kg)	MS Spk Amount (ug/Kg)	MSD Spk Amount (ug/Kg)	MS Result (ug/Kg)	MSD Result (ug/Kg)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
TOTAL XYLENES	0	196	189	3.97	163	* 2.0	86	60-140	*190	30
TOLUENE	0	65.5	63.0	8.13	51.2	*12	81	60-140	*140	30
NAPHTHALENE	0	65.5	63.0	3.41	50.0	*5.2	79	60-140	*170	30
MTBE	0	65.5	63.0	41.9	68.4	64	108	60-140	*48	30
ETHYLBENZENE	0	65.5	63.0	2.67	56.0	*4.1	89	60-140	*180	30
BENZENE	0	65.5	63.0	13.4	52.1	*20	83	60-140	*120	30
1,2-DIBROMOETHANE	0	65.5	63.0	17.2	56.8	*26	90	60-140	*110	30

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKM01B

Lab Name: Katahdin Analytical Services SDG No.: WP3079

Lab File ID: M0862 Lab Sample ID: VBLKM01B

Date Analyzed: 07/01/99 Time Analyzed: 10:36

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5972-M

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSM01A	LCSM01A	M0860	7/1/99	9:07:00 AM
30SLB170910	WP3079-7DL	M0869	7/1/99	3:54:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKM01B
SDG: WP3079
Report Date: 8/18/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 7/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKM01B	AQ	-	-	7/1/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	97	%	1.0		
1,2-DICHLOROETHANE-D4	94	%	1.0		
TOLUENE-D8	105	%	1.0		
P-BROMOFLUOROBENZENE	102	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: M0860 **Sample ID: LCSM01A** **Date Run: 7/1/99**

Analyst: DJP **Time Injected 9:07:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	54.2	108	60-140
BENZENE	50	50.5	101	60-140
ETHYLBENZENE	50	51.0	102	60-140
MTBE	50	49.7	99	60-140
NAPHTHALENE	50	77.2	*154	60-140
TOLUENE	50	54.1	108	60-140
TOTAL XYLENES	150	155	103	60-140

*** Out of Limits** *1*

Quantum Analytical Services, Inc.
Quality Control Report

Method Blank and Laboratory Control Sample Results

Client:	Tetra Tech NUS
Work Order:	WP3079

			METHOD BLANK RESULTS						*LABORATORY CONTROL SAMPLE RESULTS*					
Parameter	Date of Prep	Date of Analysis	Units		Concentration Measured in Blank		Acceptance Range	Practical Quantitation Level**	Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
TS -Total Residue	29-Jun-99	30-Jun-99	wt %	<	0.10	<	0.10	0.10	wt %	90	89.9	99.9	80-120	
	29-Jun-99	30-Jun-99	wt %	<	0.10	<	0.10	0.10						
TCO-Total Combustible Organics	29-Jun-99	30-Jun-99	wt %	<	0.10	<	0.10	0.10						

** Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

0000075

[redacted]

Duplicate and Matrix Spike/Matrix Spike Duplicate Results

Client:	Tetra Tech NUS
Work Order:	WP3079

			DUPLICATE RESULTS					*MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS*								
			Sample Measurements		Mean		Acceptance Range	Concentration or Quantity				Matrix Spike Recovery (%)				
Parameter	Sample No	Units	Rep 1	Rep 2	Conc	RPD (%)	for RPD (%)	Units	Sampl Only	Spike Added	Sample +Spike Dup 1	Sample +Spike Dup 2	Sample +Spike Dup 1	Sample +Spike Dup 2	Acceptance Range (%)	RPD (%)	Acceptance Range (%)
TS	WP3079-3	wt%	92.0	91.7	91.9	0.3	0-20	MS/MSD Not Applicable for this Parameter									
	WP3079-5	wt%	91.7	91.7	91.7	0.0	0-20	MS/MSD Not Applicable for this Parameter									
TVS	WP3079-3	wt%	2.74	2.77	2.76	1.1	0-20	MS/MSD Not Applicable for this Parameter									

RPD = Relative percent difference, which is the absolute value of the difference between two replicate results divided by the mean concentration then multiplied by 100%.

DATA QUALITY COMMENTS:

Results of all quality control measurements are within the laboratory or contract specified acceptance range except as noted. The laboratory does not use the sample duplicate and matrix spike acceptance ranges as acceptance criteria for a specific analysis. Sample duplicate and matrix spike data are used to evaluate method performance in the environmental sample matrix only. Please refer to LCS data for assessment of quality control for each parameter.

S. W. COLE ENGINEERING, INC.

REPORT OF GRADATION
ASTM C-117, C-136

Project No. 99008
Date 06/30/1999

Project MISCELLANEOUS

Client KATAHDIN ANALYTICAL

Sample No. 32, SILTY SAND, WP3079-1

Sieve Size	Percent Passing	PROJECT Specifications %
1/2 "	100.0	
1/4 "	99.9	
# 4	99.9	
# 10	99.9	
# 20	99.9	
# 40	99.8	
# 60	95.2	
# 100	22.5	
# 200	1.0	

S. W. COLE ENGINEERING, INC.

REPORT OF GRADATION
ASTM C-117, C-136

Project No. 99008
Date 06/30/1999

Project MISCELLANEOUS

Client KATAHDIN ANALYTICAL

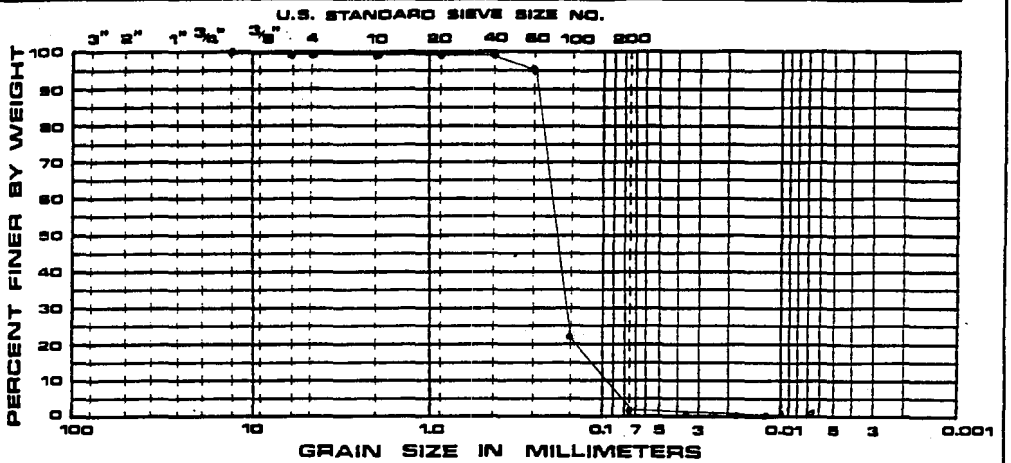
Sample No. 33, SAND, WP3079-2

Sieve Size	Percent Passing	PROJECT Specifications %
1/4 "	100.0	
# 4	99.9	
# 10	99.9	
# 20	98.9	
# 40	95.0	
# 60	83.5	
# 100	20.8	
# 200	5.3	

JOB NO: 77-000

GRAIN SIZE ANALYSIS

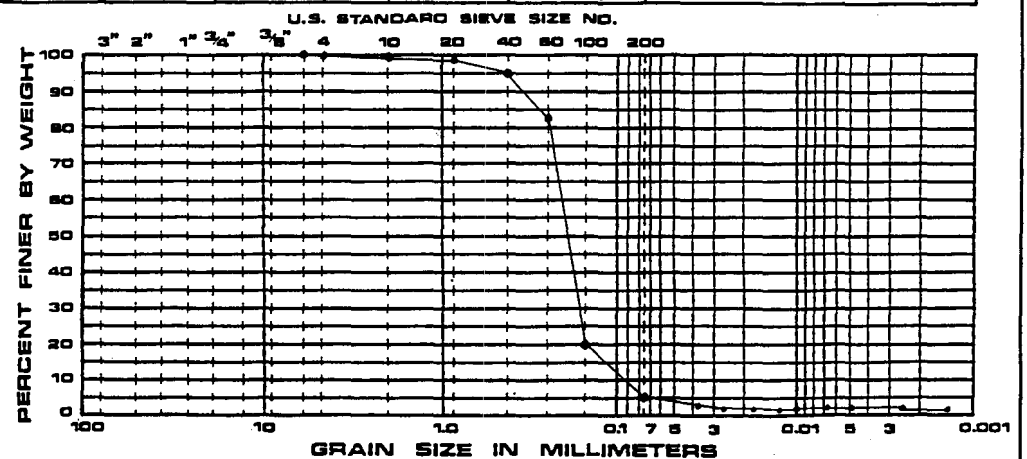
COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
•	WR9079-1	C22				

GRAIN SIZE ANALYSIS

COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
•	WR9079-2	C23				

CASE NARRATIVE
for
Katahdin Analytical
Westbrook, ME
Former Charleston Naval Complex Site
SDG #96925S

July 22, 1999

Laboratory Identification:

General Engineering Laboratories, Inc. (GEL)

Mailing Address:

P.O. Box 30712
Charleston, SC 29417

Express Mail Delivery and Shipping Address:

2040 Savage Rd
Charleston, SC 29414

Telephone Number:

(843) 556-8171

Summary:

Sample receipt

The samples from the former Charleston Naval Complex site arrived at General Engineering Laboratories, Inc., Charleston, SC on June 28, 1999, for environmental analyses. All sample containers arrived without any visible signs of tampering or breakage. The samples were delivered with chain of custody documentation and signatures.

The following samples were received by the laboratory:

Laboratory Identification	Sample Description
9906925-02	30SLB140304D
9906925-03	30SLB140304
9906925-04	30SLB170910
9906925-05	30SLB170910D
9906925-06	26SLB010405

9906925-07	26SLB010405D
9906925-08	26SLB030304
9906925-09	26SLB030304D

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

Internal Chain of Custody:

Custody was maintained for all samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, and General Chemistry.

The following are definitions of reporting limits used at General Engineering Laboratories:

DL — Detection Limit: The minimum level of an analyte that can be determined (identified not quantified) with 99% confidence. The values are normally achieved by preparing and analyzing seven aliquots of laboratory water spiked 1 to 5 times the estimated MDL, taking the standard deviation and multiplying it against the one-tailed t-statistic at 99%. This computed value is then verified for reasonableness by repeating the study using the concentration found in the initial study, calculating an F-ratio, and computing the final limit. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The detection limit is the minimum concentration of a substance that can be identified, measured, and reported with 99% confidence that the analyte concentration is above zero. It answers the question "Is It Present."

QL — Quantitation Limit: The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The QL is generally 5 to 10 times the MDL. However, it may be nominally chosen within these guidelines to simplify data reporting. For many analytes the QL analyte concentration is selected as the lowest non-zero standard in the calibration curve.

Sample QL's are highly matrix-dependent. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The QL is always $\geq$ DL.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Valerie S. Davis
Project Manager

fc:saic9906925%

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

CHAIN OF CUSTODY RECORD

Page_____ of _____

9906925 1.

Client Name/Facility Name: Katahdin

Collected by/Company: Tetratech

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	TPH	Remarks
01	3ØSLB14Ø3Ø4M	6/28	—		X			2		X														X	Matrix Spike
02	3ØSLB14Ø3Ø4D	"	1040		X			1		X															
03	3ØSLB14Ø3Ø4	"	1040		X			1		X														X	
04	3ØSLB17Ø91Ø	"	11ØØ		X			1																X	
05	3ØSLB17Ø91ØD	"	11ØØ		X			1																X	
06	26SLBØ1Ø4Ø5	"	1435		X			1																X	
07	26SLBØ1Ø4Ø5D	"	1435		X			1																X	
08	26SLBØ3Ø3Ø4	"	1450		X			1		X															
09	26SLBØ3Ø3Ø4D	"	1450		X			1		X															

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	6289	1800					

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
			[signature]	6/28/99	1809	

White = sample collector Yellow = file Pink = with report

6

FEDERAL SAMPLE RECEIPT REVIEW

Client KATA Received by [illegible] Date 6/28/99

GEL COOLER___ GEL POLY COOLER___ CLIENT COOLER___ OTHER___

SAMPLE REVIEW CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? If no, notify Project Manager	✓		
2. Was the Shipment screened following the radiochemistry survey procedure (EPI SOP S-007)?	✓		
Were the survey results negative? If no, notify Project Manager	✓		
Are any of the samples identified by the client as radioactive? If yes, did client provide RAD activity?		✓	
3. Were chain of custody documents included?	✓		
4. Were chain of custody documents completed correctly? (Ink, signed, match containers)	✓		
5. Were all sample containers properly labeled?	✓		
6. Were proper sample containers received?	✓		
7. Preserved samples checked for pH?	—		
8. Were samples preserved correctly? If no, list samples & tests	—		SO2
9. Shipping container temperature checked?	✓		
10. Was shipping conatiner temperature within specifications (4°± 2° C) If no, notify Project Manager	✓		4°C
11. Is temperature documented on the Chain of Custody?	—		
12. **Were samples received within holding time?** if No, notify Project Manger	✓		
13. **Were VOA vials free of headspace?**	—		
14. **ARCOC# IF REQUIRED**	—		
15. SDG# IF REQUIRED	✓		969255

REVIEW [illegible] DATE 6/28/99 SA - SEALS ATTACHED NSA - NO SEALS ATTACHED

Spike Analyses:

The post spike was run on the following Sample Number.

9906925-03

The analyte recoveries in the post spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

Additional Comments:

TOC solid samples are tested to determine if inorganic carbon such as carbonates and bicarbonates are present in the sample. If so, the sample is acidified to remove the inorganic carbon, then dried in a low temperature oven. Because the sample portion is dried before analysis, the percent moisture correction is not applied to the TOC solid result.

TOTAL PETROLEUM HYDROCABONS

Analytical Batch Number: 153636

Analytical Method: SW846 9071A

Laboratory Number	Sample Description
9906925-03	30SLB140304
9906925-04	30SLB170910
9906925-05	30SLB170910D
9906925-06	26SLB010405
9906925-07	26SLB010405D
QC629158	Blank
QC629159	Laboratory Control Sample
QC629160	Duplicate of 9906925-03
QC629161	Matrix Spike of 9906925-03

Instrument Calibration:

Because there is no EPA method for TPH-IR analysis of solid samples, the aqueous method was modified. The samples were prepped by sonication in accordance with SW846 3550.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The matrix spike was run on the following Sample Number.

9906925-03

All analyte recoveries in the matrix spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Sample Duplicates:

The sample and duplicate results were less than the PQL; therefore, the RPD is not applicable.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

The preceding narratives have been reviewed by: [signature] Date: 07/21/99

Client:	Katahdin Analytical
	340 County Road
	Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: July 20, 1999

Sample ID	: 30SLB140304D
Lab ID	: 9906925-02
Matrix	: Soil
Date Collected	: 06/28/99
Date Received	: 06/28/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Evaporative Loss @ 105 C		7.00	1.00	1.00	wt%	1.0	GJ	06/29/99	1540	152349	1
Total Organic Carbon		3240	43.1	100	mg/kg	1.0	LJB	07/07/99	1839	152551	2

M = Method	Method-Description
M 1	EPA 3550
M 2	SW846 9060 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: July 20, 1999

Sample ID	: 30SLB140304
Lab ID	: 9906925-03
Matrix	: Soil
Date Collected	: 06/28/99
Date Received	: 06/28/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	202	109	218	mg/kg	1.0	AAT	07/19/99	1000	153636	1
Evaporative Loss @ 105 C		8.00	1.00	1.00	wt%	1.0	GJ	06/29/99	1540	152349	2
Total Organic Carbon		6410	43.1	100	mg/kg	1.0	LIB	07/07/99	1443	152551	3

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550
M 3	SW846 9060 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: July 20, 1999

Sample ID	: 30SLB170910
Lab ID	: 9906925-04
Matrix	: Soil
Date Collected	: 06/28/99
Date Received	: 06/28/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		255	104	208	mg/kg	1.0	AAT	07/19/99	1000	153636	1
Evaporative Loss @ 105 C		4.00	1.00	1.00	wt%	1.0	GJ	06/29/99	1540	152349	2

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: July 20, 1999

Sample ID	: 30SLB170910D
Lab ID	: 9906925-05
Matrix	: Soil
Date Collected	: 06/28/99
Date Received	: 06/28/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		224	104	208	mg/kg	1.0	AAT	07/19/99	1000	153636	1
Evaporative Loss @ 105 C		4.00	1.00	1.00	wt%	1.0	GJ	06/29/99	1540	152349	2

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

QC Summary Report

Project Description: Former Naval Complex

cc: KATA00199 Lab. Sample ID: 9906925% Report Date: July 20, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
General Chemistry													
QC629158	BLANK	153636											
Total Rec. Petro. Hydrocarbons						30.0	mg/kg				AAT	07/19/99	1000
QC629161	9906925-03DUP	153636											
Total Rec. Petro. Hydrocarbons				201		261	mg/kg	25.9					
QC629159	LCS	153636											
Total Rec. Petro. Hydrocarbons			11000			10700	mg/kg		97.1	(70.0 - 116.)			
QC629160	9906925-03MS	153636											
Total Rec. Petro. Hydrocarbons			11300	201		11200	mg/kg		96.4	(70.0 - 130.)			
QC624237	BLANK	152349											
Evaporative Loss @ 105 C						0.00	wt%				GJ	06/29/99	1540
QC624236	9906925-09DUP	152349											
Evaporative Loss @ 105 C				6.00		6.00	wt%	0.00					
QC624957	BLANK	152551											
Total Organic Carbon						7.21	mg/kg				LIB	07/07/99	1414
QC624958	9906925-03DUP	152551											
Total Organic Carbon				6410		6280	mg/kg	1.91			LIB	07/07/99	1457
QC624960	LCS	152551											
Total Organic Carbon			3750			4730	mg/kg		126	(88.0 - 130.)	LIB	07/07/99	1400
QC624959	9906925-03PS	152551											
Total Organic Carbon			8890	6410		15200	mg/kg		98.4	(73.0 - 129.)	LIB	07/07/99	1507

Notes:
The qualifiers in this report are defined as follows:
J indicates presence of analyte < RL (Report Limit)
U indicates presence of analyte < DL (Detect Limit)

n/a indicates that spike recovery limits do not apply when
sample concentration exceeds spike conc by a factor of 4 or more

Katahdin
ANALYTICAL SERVICES

September 27, 1999

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP3683
Project ID: CNC Charleston
Project Manager: Ms. Andrea J.Colby
Sample Receipt Date(s): 8/19/99 and 8/20/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Patricia Homey
Authorized Signature

9/27/99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on August 20, 1999 and were logged in under Katahdin Analytical Services work order number WP3683 for a hardcopy due date of September 19, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample Identification
WP3683-1	30TL00101	
WP3683-2	31GLM0601	
WP3683-3	28SLB030102	9908592-05
WP3683-4	30SLB330506	
WP3683-5	30SLB210708	
WP3683-6	30SLB200607	
WP3683-7	28SLB020102	
WP3683-8	28SLB030102D	9908592-06
WP3683-9	24SLB120102	
WP3683-10	24SLB110102	
WP3683-11	28SLB050203	

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Nine soil/sediment and two aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on August 20, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5970-Q (aqueous and methanol soils) and the 5973-U (low level soil) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. A soil matrix spike/matrix spike duplicate pair was performed on sample WP3683-3.

Initial analyses of samples WP3683-3, -6, -8, -10, and -11 yielded internal standard area or surrogate recovery deviations. Reanalyses yielded similar results, confirming matrix interference. In the case of WP3683-3, analysis of the MS/MSD confirmed matrix interference in the parent sample. Both sets of data are included in this data package for each sample.

Initial analyses of samples WP3683-4 and -5 yielded target analyte concentrations over the upper limit of the calibration curve. Analysis of sample WP3683-5 also yielded internal standard area and surrogate recovery deviations. Reanalyses occurred using the methanol extruded samples. The methanol analysis of sample WP3683-5 still yielded concentrations over the upper limit of the curve; reanalysis occurred at a 1:2 dilution. All three sets of data for sample WP3683-5 and both sets of data for WP3683-4 are included in the data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

One aqueous and nine soil/sediment samples were received by Katahdin Analytical Services laboratory on August 20, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the soil samples occurred following USEPA method 3550 on August 23, 1999. A laboratory control spike, consisting of all PAH analytes spiked into organic free sand, was extracted in the batch, along with a site-specific MS/MSD pair on sample WP3683-3. Extraction of the aqueous sample occurred following USEPA method 3510 on August 23, 1999. A laboratory control spike/laboratory control spike duplicate pair was extracted in the batch.

Initial analysis of sample WP3683-4 was performed at a 1:5 dilution due to the matrix, with target analytes over the upper limit of the calibration curve. Reanalysis occurred at a 1:10 dilution successfully. Both sets of data for this sample are included in the data package.

Sample WP3683-5 could only be concentrated to a final volume of 2 ml due to extract viscosity. Analysis occurred at a 1:10 dilution due to this viscosity, resulting in elevated reporting limits.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP3683 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Soil-matrix Katahdin Sample Nos. WP3683-(9, 10) were digested for ICP analysis on 08/28/99 (QC Batch PH28ICS0) in accordance with USEPA Method 3050B. Katahdin Sample No. WP3683-9 was prepared with duplicate matrix-spiked aliquots. The measured aluminum (30.9 mg/kg dry wt.), calcium (63.6 mg/kg dry wt.), and magnesium (5.85 mg/kg dry wt.) concentrations of the preparation blank that is associated with this QC batch exceed the laboratory's acceptance limits for these elements. However, because the measured concentrations of these elements in all associated samples are more than ten times those of the preparation blank, no corrective action was required.

ICP analyses of Katahdin Work Order WP3683 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Soil-matrix Katahdin Sample Nos. WP3683-(9, 10) were digested for mercury analysis on 08/24/99 (QC Batch PH24HGS0) in accordance with USEPA Method 7471A.

Mercury analyses of Katahdin Work Order WP3683 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

For work order WP3683 the analyses for Total Combustible Organics (TCO) have been performed in accordance with the "Annual Book of ASTM Standards", 1987. Analyses for Solids-Total Residue (TS) for work order WP3683 samples have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All analyses were performed within analytical hold time. No protocol deviations were noted by the Wet Chemistry laboratory staff.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP3683

PAGE: 1 OF 1

COOLER: 1 OF 1

COC#: —

SDG#: —

DATE / TIME RECEIVED: 08-20-99 - 0845

DELIVERED BY: FEDEX

RECEIVED BY: BKR

LIMS ENTRY BY: BER

LIMS REVIEW BY / PM: MC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐	SAMPLER DID NOT SIGN COC.	
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☐	☑	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 4.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? (ICE) ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED(1)?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES(1): ⇒ 24 SLB050203 extra sample (VOC & PAH) sent yet not on C.O.C. contacted proj. mngr. client notified
client requested that extra sample be put on COC as 28SLB050203

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

TAL labels added to 24SLB120102 & 24SLB110102 8/23/99 by Bryn Hauze

0000085

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: Tetra Tech NUS | Contact: Bryn Howze | Phone #: (843) 554-4925 | Fax #: ( )

Address: N1121 Ave. H | City: N. Charleston | State: SC | Zip Code:

Purchase Order # | Proj. Name / No. | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign) | Copies To:

LAB USE ONLY | WORK ORDER #: WP 3683 - * | KATAHDIN PROJECT MANAGER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO: 813402904473

TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, EDB, Naph	PAH	Grain size	FOC	TAL metals						
	30SLB330506	8/19/99/0915	Soil	5	4	1							408 ppm		
	30SLB210708	8/19/99/1000	soil	5	4	1							1270 ppm		
	30SLB200607	8/19/99/1025	soil	5	4	1							3 ppm		
	28SLB020102	8/19/99/1325	soil	5	4	1							0 ppm		
*	28SLB030102	8/19/99/1410	soil	6	4	1	1	✓					0 ppm		
*	28SLB030102D	8/19/99/	soil	5	4	1		✓					0 ppm		
*	28SLB030102M	8/19/99/1410	soil	5	4	1		✓	-MS/MSD				0 ppm		
	24SLB120102	8/19/99/1545	soil	5	4	1			✓				0 ppm		
	24SLB110102	8/19/99/1600	soil	5	4	1			✓				0 ppm		
	30TL00101	8/19/99/	aq	2	2										
	31GLM0601	8/19/99/1740	aq	5	3	2									
	28SLB050203	8/19/99/1345	soil	5	4	1									
		/													
		/													
		/													
		/													

COMMENTS

* These samples also need to be tested for FOC from the 4oz PAH jar.

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
		813402904473		8-20-99 0845	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3683

Project Manager: Andrea J. Colby
ORDER DATE: 08/20/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 19 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 19 OCT

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3683-1	30TL00101	19 AUG	20 AUG	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3683-2	31GLM0601	19 AUG 1740	20 AUG	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00
TOTALS		1	200.00	200.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3683-3	28SLB030102	19 AUG 1410	20 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Grain Size Subcontract		1	110.00	110.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Total Combustible Organics	ASTM D2974	1	30.00	30.00
TOC Subcontract		1	60.00	60.00
TOTALS		1	420.00	420.00

LABORATORY ORDER CONTINUED ON PAGE 2

0000087/90

ORDER NO WP-3683

Project Manager: Andrea J. Colby
ORDER DATE: 08/20/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 19 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 19 OCT

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3683-4	30SLB330506	19 AUG 0915	20 AUG	SL
	WP3683-5	30SLB210708	19 AUG 1000		
	WP3683-6	30SLB200607	19 AUG 1025		
	WP3683-7	28SLB020102	19 AUG 1325		
	WP3683-11	28SLB050203	19 AUG 1345		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	5	85.00	425.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	5	135.00	675.00
Solids-Total Residue (TS)	CLP/CIP SO	5	0.00	0.00
TOTALS		5	220.00	1100.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP3683-8	28SLB030102D	19 AUG	20 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Total Combustible Organics	ASTM D2974	1	30.00	30.00
TOC Subcontract		1	60.00	60.00
TOTALS		1	310.00	310.00

LABORATORY ORDER CONTINUED ON PAGE 3

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3683

Project Manager: Andrea J. Colby
ORDER DATE: 08/20/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 19 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 19 OCT

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP3683-9	24SLB120102	19 AUG 1545	20 AUG	SL
	WP3683-10	24SLB110102	19 AUG 1600		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	85.00	170.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	135.00	270.00
Solids-Total Residue (TS)	CLP/CIP SO	2	0.00	0.00
Target Analyte List Metals, Total		2	100.00	200.00
TOTALS		2	320.00	640.00

ORDER NOTE: QC-II+ W/NARRATIVE
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH, PA 15220
REPORT AND DISK

INVOICE: With Report

TOTAL ORDER AMOUNT $2,745.00
This is NOT an Invoice

AJC/BKR/WEST.AJC(dw)
08-23Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

0000089 N/8/2-40C

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
$	'$' flag denotes surrogate compound recovery is out of criteria. Re-extraction or re-analysis confirmed matrix interference.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-1	Sample dilution required due to matrix interference, sample viscosity or other matrix-related problem; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.
O-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
DL	'DL' flag denotes inability to calculate surrogate recovery due to sample dilution.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-1	Sample dilution required due to matrix interference, sample viscosity or other matrix-related problem; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-1
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30TL00101	AQ	8/19/99	8/20/99	8/23/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	96	%	1.0		
1,2-DICHLOROETHANE-D4	93	%	1.0		
TOLUENE-D8	102	%	1.0		
P-BROMOFLUOROBENZENE	100	%	1.0		

Report Notes:

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3683-4
Report Date: 09/27/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB330506	Solid	CLIENT	08/19/99	08/20/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	79.	wt %	1.0	0.10	CLP/CIP SOW	08/25/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/24/99 by JF

09/27/99

LJO/msmajc(dw)
PH24TSS8
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-4
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 79
Method: EPA 8270
Date Analyzed: 9/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB330506	SL	8/19/99	8/20/99	8/23/99	LAP	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	9100	ug/Kg	6.3	2100	330
2-METHYLNAPHTHALENE	E40000	ug/Kg	6.3	2100	330
ACENAPHTHYLENE	<2100	ug/Kg	6.3	2100	330
ACENAPHTHENE	2600	ug/Kg	6.3	2100	330
FLUORENE	5500	ug/Kg	6.3	2100	330
PHENANTHRENE	11000	ug/Kg	6.3	2100	330
ANTHRACENE	<2100	ug/Kg	6.3	2100	330
FLUORANTHENE	<2100	ug/Kg	6.3	2100	330
PYRENE	<2100	ug/Kg	6.3	2100	330
BENZO[A]ANTHRACENE	<2100	ug/Kg	6.3	2100	330
CHRYSENE	<2100	ug/Kg	6.3	2100	330
BENZO[B]FLUORANTHENE	<2100	ug/Kg	6.3	2100	330
BENZO[K]FLUORANTHENE	<2100	ug/Kg	6.3	2100	330
BENZO[A]PYRENE	<2100	ug/Kg	6.3	2100	330
INDENO[1,2,3-CD]PYRENE	<2100	ug/Kg	6.3	2100	330
DIBENZ[A,H]ANTHRACENE	<2100	ug/Kg	6.3	2100	330
BENZO[G,H,I]PERYLENE	<2100	ug/Kg	6.3	2100	330
NITROBENZENE-D5	102	%	6.3		
2-FLUOROBIPHENYL	91	%	6.3		
TERPHENYL-D14	84	%	6.3		

Report Notes: E, O-1

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-4DL
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 79
Method: EPA 8270
Date Analyzed: 9/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB330506	SL	8/19/99	8/20/99	8/23/99	KRT	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	9100	ug/Kg	13	4300	330
2-METHYLNAPHTHALENE	39000	ug/Kg	13	4300	330
ACENAPHTHYLENE	<4300	ug/Kg	13	4300	330
ACENAPHTHENE	J2300	ug/Kg	13	4300	330
FLUORENE	5700	ug/Kg	13	4300	330
PHENANTHRENE	11000	ug/Kg	13	4300	330
ANTHRACENE	<4300	ug/Kg	13	4300	330
FLUORANTHENE	<4300	ug/Kg	13	4300	330
PYRENE	<4300	ug/Kg	13	4300	330
BENZO[A]ANTHRACENE	<4300	ug/Kg	13	4300	330
CHRYSENE	<4300	ug/Kg	13	4300	330
BENZO[B]FLUORANTHENE	<4300	ug/Kg	13	4300	330
BENZO[K]FLUORANTHENE	<4300	ug/Kg	13	4300	330
BENZO[A]PYRENE	<4300	ug/Kg	13	4300	330
INDENO[1,2,3-CD]PYRENE	<4300	ug/Kg	13	4300	330
DIBENZ[A,H]ANTHRACENE	<4300	ug/Kg	13	4300	330
BENZO[G,H,I]PERYLENE	<4300	ug/Kg	13	4300	330
NITROBENZENE-D5	96	%	13		
2-FLUOROBIPHENYL	100	%	13		
TERPHENYL-D14	79	%	13		

Report Notes: J, O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-4DL
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 79
Method: SW8260
Date Analyzed: 8/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB330506	SL	8/19/99	8/20/99	8/28/99	HMP	5035	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<340	ug/Kgdrywt	67	340	5
TOLUENE	<340	ug/Kgdrywt	67	340	5
1,2-DIBROMOETHANE	<340	ug/Kgdrywt	67	340	5
ETHYLBENZENE	3000	ug/Kgdrywt	67	340	5
NAPHTHALENE	11000	ug/Kgdrywt	67	340	5
MTBE	<340	ug/Kgdrywt	67	340	5
TOTAL XYLENES	<340	ug/Kgdrywt	67	340	5
DIBROMOFLUOROMETHANE	99	%	67		
1,2-DICHLOROETHANE-D4	97	%	67		
TOLUENE-D8	101	%	67		
P-BROMOFLUOROBENZENE	107	%	67		

Report Notes: O-1, O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-4
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 79
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB330506	SL	8/19/99	8/20/99	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.3	6	5
TOLUENE	<6	ug/Kg	1.3	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.3	6	5
ETHYLBENZENE	E320	ug/Kg	1.3	6	5
NAPHTHALENE	E1600	ug/Kg	1.3	6	5
MTBE	<6	ug/Kg	1.3	6	5
TOTAL XYLENES	7	ug/Kg	1.3	6	5
DIBROMOFLUOROMETHANE	$26	%	1.3		
1,2-DICHLOROETHANE-D4	$62	%	1.3		
TOLUENE-D8	$4	%	1.3		
P-BROMOFLUOROBENZENE	$176	%	1.3		

Report Notes: E, $

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3683-5
Report Date: 09/27/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB210708	Solid	CLIENT	08/19/99	08/20/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	80.	wt %	1.0	0.10	CLP/CIP SOW	08/25/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/24/99 by JF

09/27/99

LJO/msmajc(dw)
PH24TSS8
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-5
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 80
Method: EPA 8270
Date Analyzed: 9/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB210708	SL	8/19/99	8/20/99	8/23/99	LAP	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	9200	ug/Kg	25	8200	330
2-METHYLNAPHTHALENE	32000	ug/Kg	25	8200	330
ACENAPHTHYLENE	<8200	ug/Kg	25	8200	330
ACENAPHTHENE	<8200	ug/Kg	25	8200	330
FLUORENE	J5600	ug/Kg	25	8200	330
PHENANTHRENE	9300	ug/Kg	25	8200	330
ANTHRACENE	<8200	ug/Kg	25	8200	330
FLUORANTHENE	<8200	ug/Kg	25	8200	330
PYRENE	<8200	ug/Kg	25	8200	330
BENZO[A]ANTHRACENE	<8200	ug/Kg	25	8200	330
CHRYSENE	<8200	ug/Kg	25	8200	330
BENZO[B]FLUORANTHENE	<8200	ug/Kg	25	8200	330
BENZO[K]FLUORANTHENE	<8200	ug/Kg	25	8200	330
BENZO[A]PYRENE	<8200	ug/Kg	25	8200	330
INDENO[1,2,3-CD]PYRENE	<8200	ug/Kg	25	8200	330
DIBENZ[A,H]ANTHRACENE	<8200	ug/Kg	25	8200	330
BENZO[G,H,I]PERYLENE	<8200	ug/Kg	25	8200	330
NITROBENZENE-D5	DL	%	25		
2-FLUOROBIPHENYL	DL	%	25		
TERPHENYL-D14	DL	%	25		

Report Notes: J, DL, O-1

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-5DL
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 80
Method: SW8260
Date Analyzed: 8/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB210708	SL	8/19/99	8/20/99	8/28/99	HMP	5035	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<300	ug/Kgdrywt	59	300	5
TOLUENE	<300	ug/Kgdrywt	59	300	5
1,2-DIBROMOETHANE	<300	ug/Kgdrywt	59	300	5
ETHYLBENZENE	3900	ug/Kgdrywt	59	300	5
NAPHTHALENE	7600	ug/Kgdrywt	59	300	5
MTBE	<300	ug/Kgdrywt	59	300	5
TOTAL XYLENES	5400	ug/Kgdrywt	59	300	5
DIBROMOFLUOROMETHANE	102	%	59		
1,2-DICHLOROETHANE-D4	103	%	59		
TOLUENE-D8	98	%	59		
P-BROMOFLUOROBENZENE	109	%	59		

Report Notes: E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-5DL2
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 80
Method: SW8260
Date Analyzed: 8/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB210708	SL	8/19/99	8/20/99	8/30/99	KMC	5035	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<600	ug/Kgdrywt	120	600	5
TOLUENE	<600	ug/Kgdrywt	120	600	5
1,2-DIBROMOETHANE	<600	ug/Kgdrywt	120	600	5
ETHYLBENZENE	3800	ug/Kgdrywt	120	600	5
NAPHTHALENE	5700	ug/Kgdrywt	120	600	5
MTBE	<600	ug/Kgdrywt	120	600	5
TOTAL XYLENES	5600	ug/Kgdrywt	120	600	5
DIBROMOFLUOROMETHANE	92	%	120		
1,2-DICHLOROETHANE-D4	86	%	120		
TOLUENE-D8	100	%	120		
P-BROMOFLUOROBENZENE	102	%	120		

Report Notes: O-1, O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-5
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 80
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB210708	SL	8/19/99	8/20/99	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	7	ug/Kg	1.2	6	5
TOLUENE	50	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	E1600	ug/Kg	1.2	6	5
NAPHTHALENE	E760	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	E2500	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	$190	%	1.2		
1,2-DICHLOROETHANE-D4	$225	%	1.2		
TOLUENE-D8	$81	%	1.2		
P-BROMOFLUOROBENZENE	$530	%	1.2		

Report Notes: E, $, O-13

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3683-6
Report Date: 09/27/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB200607	Solid	CLIENT	08/19/99	08/20/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	96.	wt %	1.0	0.10	CLP/CIP SOW	08/25/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/24/99 by JF

09/27/99

LJO/msmajc(dw)
PH24TSS8
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-6
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 96
Method: EPA 8270
Date Analyzed: 9/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB200607	SL	8/19/99	8/20/99	8/23/99	LAP	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<330	ug/Kg	1.0	330	330
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330
ACENAPHTHENE	<330	ug/Kg	1.0	330	330
FLUORENE	<330	ug/Kg	1.0	330	330
PHENANTHRENE	<330	ug/Kg	1.0	330	330
ANTHRACENE	<330	ug/Kg	1.0	330	330
FLUORANTHENE	<330	ug/Kg	1.0	330	330
PYRENE	<330	ug/Kg	1.0	330	330
BENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330
CHRYSENE	<330	ug/Kg	1.0	330	330
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[A]PYRENE	<330	ug/Kg	1.0	330	330
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330
BENZO[G,H,I]PERYLENE	<330	ug/Kg	1.0	330	330
NITROBENZENE-D5	63	%	1.0		
2-FLUOROBIPHENYL	81	%	1.0		
TERPHENYL-D14	89	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-6
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 96
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB200607	SL	8/19/99	8/20/99	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	10	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	17	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	114	%	1.2		
1,2-DICHLOROETHANE-D4	132	%	1.2		
TOLUENE-D8	$58	%	1.2		
P-BROMOFLUOROBENZENE	$23	%	1.2		

Report Notes: $

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3683-6RA
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 96
Method: SW8260
Date Analyzed: 8/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB200607	SL	8/19/99	8/20/99	8/28/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	<6	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	$6	%	1.2		
1,2-DICHLOROETHANE-D4	$11	%	1.2		
TOLUENE-D8	$2	%	1.2		
P-BROMOFLUOROBENZENE	$3	%	1.2		

Report Notes: $

Katahdin Analytical Services, Inc
Quality Control Report

Method Blank and Laboratory Control Sample Results

Client:	Tetra Tech NUS
Work Order:	WP3683

				METHOD BLANK RESULTS				*LABORATORY CONTROL SAMPLE RESULTS*					
Parameter	Date of Prep	Date of Analysis	Units		Concentration Measured in Blank		Acceptance Range	Practical Quantitation Level**	Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
TS -Total Residue	23-Sep-99	26-Sep-99	wt %	<	0.10	<	0.10	0.10	wt %	NA			80-120	
	24-Sep-99	25-Sep-99	wt %	<	0.10	<	0.10	0.10	wt %	90.0	89.9	100	80-120	
	24-Sep-99	25-Sep-99	wt %	<	0.10	<	0.10	0.10	wt %	90.0	89.9	100	80-120	
TCO - Combustible	23-Sep-99	26-Sep-99	wt %	<	0.10	<	0.10	0.10	wt %	NA			80-120	

** Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

0000054

Saltillo Analytical Services, Inc
Quality Control Report

Duplicate and Matrix Spike/Matrix Spike Duplicate Results

Client:	Tetra Tech NUS
Work Order:	WP3683

			DUPLICATE RESULTS					*MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS*								
			Sample Measurements		Mean		Acceptance Range		Concentration or Quantity				Matrix Spike Recovery (%)			
Parameter	Sample No	Units	Rep 1	Rep 2	Conc	RPD (%)	for RPD (%)	Units	Sampl Only	Spike Added	Sample +Spike Dup 1	Sample +Spike Dup 2	Sample +Spike Dup 1	Sample +Spike Dup 2	Acceptance Range (%)	RPD (%)	Acceptance Range (%)
TS	WP3683-11	wt%	66.6	67.5	67.1	1.3	0-20	MS/MSD Not Applicable for this Parameter									

RPD = Relative percent difference, which is the absolute value of the difference between two replicate results divided by the mean concentration then multiplied by 100%.

NA = Not applicable.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory or contract specified acceptance range except as noted. The laboratory does not use the sample duplicate and matrix spike acceptance ranges as acceptance criteria for a specific analysis. Sample duplicate and matrix spike data are used to evaluate method performance in the environmental sample matrix only. Please refer to LCS data for assessment of quality control for each parameter.

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;082399B

Lab Name: Katahdin Analytical Services SDG No.: WP3683

Lab File ID: Z2031

Lab Sample ID: SBLK;082399B

Instrument ID: 5972-Z

Date Extracted: 8/23/99

GC Column: RTX-5 ID: 0.25 (mm)

Date Analyzed: 09/10/99

Matrix: (soil/water) SOIL

Time Analyzed: 14:50

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
28SLB030102	WP3683-3	Z2020	9/9/99	9:59:00 PM
28SLB030102MS	WP3683-3MS	Z2021	9/9/99	10:48:00 PM
28SLB030102MSD	WP3683-3MSD	Z2022	9/9/99	11:36:00 PM
LCS;082399B	LCS;082399B	Z2032	9/10/99	3:38:00 PM
30SLB200607	WP3683-6	Z2033	9/10/99	4:26:00 PM
28SLB020102	WP3683-7	Z2034	9/10/99	5:14:00 PM
28SLB030102D	WP3683-8	Z2035	9/10/99	6:01:00 PM
24SLB120102	WP3683-9	Z2036	9/10/99	6:48:00 PM
24SLB110102	WP3683-10	Z2037	9/10/99	7:35:00 PM
28SLB050203	WP3683-11	Z2042	9/13/99	12:03:00 PM
30SLB330506	WP3683-4	Z2043	9/13/99	12:50:00 PM
30SLB330506	WP3683-4DL	Z2049	9/13/99	5:38:00 PM
30SLB210708	WP3683-5	Z2050	9/13/99	6:28:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;082399B
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: EPA 8270
Date Analyzed: 9/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;082399B	SL	-	-	8/23/99	LAP	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<330	ug/Kg	1.0	330	330
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330
ACENAPHTHENE	<330	ug/Kg	1.0	330	330
FLUORENE	<330	ug/Kg	1.0	330	330
PHENANTHRENE	<330	ug/Kg	1.0	330	330
ANTHRACENE	<330	ug/Kg	1.0	330	330
FLUORANTHENE	<330	ug/Kg	1.0	330	330
PYRENE	<330	ug/Kg	1.0	330	330
BENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330
CHRYSENE	<330	ug/Kg	1.0	330	330
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[A]PYRENE	<330	ug/Kg	1.0	330	330
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330
BENZO[G,H,I]PERYLENE	<330	ug/Kg	1.0	330	330
NITROBENZENE-D5	86	%	1.0		
2-FLUOROBIPHENYL	88	%	1.0		
TERPHENYL-D14	109	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: Z2032 **Sample ID: LCS;082399** **Date Run: 9/10/99**

Analyst: KRT **Time Injected 3:38:00 PM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1360	82	60-140
ACENAPHTHENE	1667	1420	85	60-140
ACENAPHTHYLENE	1667	1450	87	60-140
ANTHRACENE	1667	1450	87	60-140
BENZO[A]ANTHRACENE	1667	1510	91	60-140
BENZO[A]PYRENE	1667	1470	88	60-140
BENZO[B]FLUORANTHENE	1667	1380	82	60-140
BENZO[G,H,I]PERYLENE	1667	1670	100	60-140
BENZO[K]FLUORANTHENE	1667	1680	100	60-140
CHRYSENE	1667	1740	104	60-140
DIBENZ[A,H]ANTHRACENE	1667	1570	94	60-140
FLUORANTHENE	1667	1450	87	60-140
FLUORENE	1667	1420	85	60-140
INDENO[1,2,3-CD]PYRENE	1667	1670	100	60-140
NAPHTHALENE	1667	1380	83	60-140
PHENANTHRENE	1667	1500	90	60-140
PYRENE	1667	1670	100	60-140

*** Out of Limits** *1*

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3683-3	Z2020	9/9/99	9:59:00 PM	KRT	SL	8270_99
WP3683-3MS	Z2021	9/9/99	10:48:00 PM	KRT	SL	8270_99
WP3683-3MSD	Z2022	9/9/99	11:36:00 PM	KRT	SL	8270_99

Compound Name	Native (ug/Kg)	MS Spk Amount (ug/Kg)	MSD Spk Amount (ug/Kg)	MS Result (ug/Kg)	MSD Result (ug/Kg)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	1810	1810	1330	1420	73	78	60-140	6.5	50
ACENAPHTHENE	0	1810	1810	1050	1120	*58	62	60-140	6.4	50
ACENAPHTHYLENE	0	1810	1810	1060	1170	*59	64	60-140	9.9	50
ANTHRACENE	0	1810	1810	1110	1150	61	64	60-140	3.5	50
BENZO[A]ANTHRACENE	0	1810	1810	1180	1240	65	68	60-140	5.0	50
BENZO[A]PYRENE	0	1810	1810	1150	1180	63	66	60-140	2.6	50
BENZO[B]FLUORANTHENE	0	1810	1810	1020	1050	*56	*58	60-140	2.9	50
2-METHYLNAPHTHALENE	0	1810	1810	856	949	*47	*52	60-140	10	50
BENZO[K]FLUORANTHENE	0	1810	1810	1280	1320	71	73	60-140	3.1	50
PYRENE	0	1810	1810	1360	1400	75	77	60-140	2.9	50
DIBENZ[A,H]ANTHRACENE	0	1810	1810	1190	1250	66	69	60-140	4.9	50
FLUORANTHENE	0	1810	1810	1080	1100	60	61	60-140	1.8	50
FLUORENE	0	1810	1810	1110	1160	61	64	60-140	4.4	50
INDENO[1,2,3-CD]PYRENE	0	1810	1810	1320	1410	73	78	60-140	6.6	50
NAPHTHALENE	0	1810	1810	676	875	*37	*48	60-140	26	50
PHENANTHRENE	0	1810	1810	1150	1210	64	67	60-140	5.1	50
BENZO[G,H,I]PERYLENE	0	1810	1810	1270	1330	70	74	60-140	4.6	50

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ23A

Lab Name: Katahdin Analytical Services SDG No.: WP3683

Lab File ID: Q6436 Lab Sample ID: VBLKQ23A

Date Analyzed: 08/23/99 Time Analyzed: 10:14

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ23A	LCSQ23A	Q6435	8/23/99	9:24:00 AM
30TL00101	WP3683-1	Q6444	8/23/99	3:39:00 PM
31GLM0601	WP3683-2	Q6445	8/23/99	4:18:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ23A
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ23A	AQ	-	-	8/23/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	93	%	1.0		
1,2-DICHLOROETHANE-D4	86	%	1.0		
TOLUENE-D8	101	%	1.0		
P-BROMOFLUOROBENZENE	100	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6435 **Sample ID: LCSQ23A** **Date Run: 8/23/99**

Analyst: KMC **Time Injected 9:24:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	53.8	108	60-140
BENZENE	50	48.4	97	60-140
ETHYLBENZENE	50	57.9	116	60-140
MTBE	50	40.8	82	60-140
NAPHTHALENE	50	50.0	100	60-140
TOLUENE	50	51.7	103	60-140
TOTAL XYLENES	150	164	109	60-140

*** Out of Limits** *1*

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKM26B

Lab Name: Katahdin Analytical Services SDG No.: WP3683

Lab File ID: M1632 Lab Sample ID: VBLKM26B

Date Analyzed: 08/26/99 Time Analyzed: 10:17

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972-M

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSM26B	LCSM26B	M1631	8/26/99	9:33:00 AM
28SLB030102	WP3683-3	M1643	8/26/99	5:25:00 PM
28SLB030102MS	WP3683-3MS	M1644	8/26/99	6:04:00 PM
28SLB030102MSD	WP3683-3MSD	M1645	8/26/99	6:43:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKM26B
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKM26B	SL	-	-	8/26/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	J3	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	104	%	1.0		
1,2-DICHLOROETHANE-D4	95	%	1.0		
TOLUENE-D8	116	%	1.0		
P-BROMOFLUOROBENZENE	114	%	1.0		

Report Notes: J

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: M1631 **Sample ID: LCSM26B** **Date Run: 8/26/99**

Analyst: DJP **Time Injected 9:33:00 AM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	51.6	103	60-140
BENZENE	50	52.1	104	60-140
ETHYLBENZENE	50	53.9	108	60-140
MTBE	50	55.2	110	60-140
NAPHTHALENE	50	61.5	123	60-140
TOLUENE	50	50.8	102	60-140
TOTAL XYLENES	150	161	107	60-140

*** Out of Limits**

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3683-3	M1643	8/26/99	5:25:00 PM	DJP	SL	8260_99
WP3683-3MS	M1644	8/26/99	6:04:00 PM	DJP	SL	8260_99
WP3683-3MSD	M1645	8/26/99	6:43:00 PM	DJP	SL	8260_99

Compound Name	Native (ug/Kg)	MS Spk Amount (ug/Kg)	MSD Spk Amount (ug/Kg)	MS Result (ug/Kg)	MSD Result (ug/Kg)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
TOTAL XYLENES	0	172	178	145	63.9	84	*36	60-140	*78	30
TOLUENE	6.99	57.5	59.5	50.3	28.2	75	*36	60-140	*56	30
NAPHTHALENE	0	57.5	59.5	23.2	24.5	*40	*41	60-140	5.4	30
MTBE	0	57.5	59.5	48.0	77.6	84	130	60-140	*47	30
ETHYLBENZENE	0	57.5	59.5	50.5	19.4	88	*33	60-140	*89	30
BENZENE	0	57.5	59.5	51.6	31.1	90	*52	60-140	*50	30
1,2-DIBROMOETHANE	0	57.5	59.5	41.5	64.8	72	109	60-140	*44	30

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ28A

Lab Name: Katahdin Analytical Services SDG No.: WP3683

Lab File ID: Q6526 Lab Sample ID: VBLKQ28A

Date Analyzed: 08/28/99 Time Analyzed: 12:45

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ28C	LCSQ28C	Q6525	8/28/99	11:56:00 AM
30SLB330506	WP3683-4DL	Q6533	8/28/99	5:30:00 PM
30SLB210708	WP3683-5DL	Q6534	8/28/99	6:09:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ28A
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ28A	AQ	-	-	8/28/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	95	%	1.0		
1,2-DICHLOROETHANE-D4	93	%	1.0		
TOLUENE-D8	102	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6525 **Sample ID: LCSQ28C** **Date Run: 8/28/99**

Analyst: HMP **Time Injected 11:56:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	49.4	99	60-140
BENZENE	50	52.8	106	60-140
ETHYLBENZENE	50	49.5	99	60-140
MTBE	50	39.8	80	60-140
NAPHTHALENE	50	31.4	63	60-140
TOLUENE	50	53.7	107	60-140
TOTAL XYLENES	150	138	92	60-140

*** Out of Limits** *1*

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKU27A

Lab Name: Katahdin Analytical Services SDG No.: WP3683

Lab File ID: U0671 Lab Sample ID: VBLKU27A

Date Analyzed: 08/27/99 Time Analyzed: 11:31

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU27A	LCSU27A	U0670	8/27/99	10:50:00 AM
30SLB330506	WP3683-4	U0677	8/27/99	3:15:00 PM
30SLB210708	WP3683-5	U0678	8/27/99	3:51:00 PM
30SLB200607	WP3683-6	U0679	8/27/99	4:26:00 PM
28SLB030102D	WP3683-8	U0681	8/27/99	5:37:00 PM
24SLB120102	WP3683-9	U0682	8/27/99	6:12:00 PM
24SLB110102	WP3683-10	U0683	8/27/99	6:47:00 PM
28SLB050203	WP3683-11	U0684	8/27/99	7:23:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKU27A
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU27A	SL	-	-	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	104	%	1.0		
1,2-DICHLOROETHANE-D4	107	%	1.0		
TOLUENE-D8	93	%	1.0		
P-BROMOFLUOROBENZENE	89	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: U0670 **Sample ID:** LCSU27A **Date Run:** 8/27/99

Analyst: JSS **Time Injected** 10:50:00 AM **Matrix:** SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	55.0	110	60-140
BENZENE	50	52.7	105	60-140
ETHYLBENZENE	50	52.0	104	60-140
MTBE	50	55.1	110	60-140
NAPHTHALENE	50	45.6	91	60-140
TOLUENE	50	51.9	104	60-140
TOTAL XYLENES	150	151	101	60-140

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKU28A

Lab Name: Katahdin Analytical Services SDG No.: WP3683

Lab File ID: U0687 Lab Sample ID: VBLKU28A

Date Analyzed: 08/28/99 Time Analyzed: 10:48

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU28A	LCSU28A	U0686	8/28/99	10:05:00 AM
30SLB200607	WP3683-6RA	U0688	8/28/99	11:34:00 AM
28SLB020102	WP3683-7	U0689	8/28/99	12:09:00 PM
28SLB030102D	WP3683-8RA	U0690	8/28/99	12:44:00 PM
24SLB110102	WP3683-10RA	U0691	8/28/99	1:19:00 PM
28SLB050203	WP3683-11RA	U0692	8/28/99	1:54:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKU28A
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 8/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU28A	SL	-	-	8/28/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	107	%	1.0		
1,2-DICHLOROETHANE-D4	110	%	1.0		
TOLUENE-D8	101	%	1.0		
P-BROMOFLUOROBENZENE	94	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: U0686 **Sample ID: LCSU28A** **Date Run: 8/28/99**

Analyst: JSS **Time Injected 10:05:00 AM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	54.3	109	60-140
BENZENE	50	50.5	101	60-140
ETHYLBENZENE	50	51.4	103	60-140
MTBE	50	54.5	109	60-140
NAPHTHALENE	50	47.0	94	60-140
TOLUENE	50	50.5	101	60-140
TOTAL XYLENES	150	151	101	60-140

*** Out of Limits** *1*

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ30A

Lab Name: Katahdin Analytical Services SDG No.: WP3683

Lab File ID: Q6539 Lab Sample ID: VBLKQ30A

Date Analyzed: 08/30/99 Time Analyzed: 10:07

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ30A	LCSQ30A	Q6538	8/30/99	9:16:00 AM
30SLB210708	WP3683-5DL2	Q6541	8/30/99	11:38:00 AM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ30A
SDG: WP3683
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ30A	AQ	-	-	8/30/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	92	%	1.0		
1,2-DICHLOROETHANE-D4	85	%	1.0		
TOLUENE-D8	103	%	1.0		
P-BROMOFLUOROBENZENE	105	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6538 **Sample ID: LCSQ30A** **Date Run: 8/30/99**

Analyst: KMC **Time Injected 9:16:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	59.2	118	60-140
BENZENE	50	56.0	112	60-140
ETHYLBENZENE	50	62.8	126	60-140
MTBE	50	48.4	97	60-140
NAPHTHALENE	50	59.6	119	60-140
TOLUENE	50	58.6	117	60-140
TOTAL XYLENES	150	177	118	60-140

*** Out of Limits** *1*

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on June 29, 1999 and were logged in under Katahdin Analytical Services work order number WP3079 for a hardcopy due date of July 29, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample No.
WP3079-1	30SLB050708	
WP3079-2	26SLB010405	9906925-06
WP3079-3	30SLB140304	9906925-03
WP3079-4	26SLB030304	9906925-08
WP3079-5	30SLB010708	
WP3079-6	30SLB160708	
WP3079-7	30SLB170910	9906925-04
WP3079-8	30SLB170910D	9906925-05
WP3079-9	26SLB260607	
WP3079-10	26SLB220304	
WP3079-11	26SLB120304	
WP3079-12	26SLB010405D	9906925-07
WP3079-13	26TL00101	
WP3079-14	30SLB140304D	9906925-02
WP3079-15	26SLB030304D	9906925-09

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

One aqueous and twelve soil samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on June 29, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5972-M (aqueous and medium level soil) and 5972-F (low level soil) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

S. W. COLE ENGINEERING, INC.

REPORT OF GRADATION
ASTM C-117, C-136

Project No. 99008
Date 06/30/1999

Project MISCELLANEOUS

Client KATAHDIN ANALYTICAL

Sample No. 32, SILTY SAND, WP3079-1

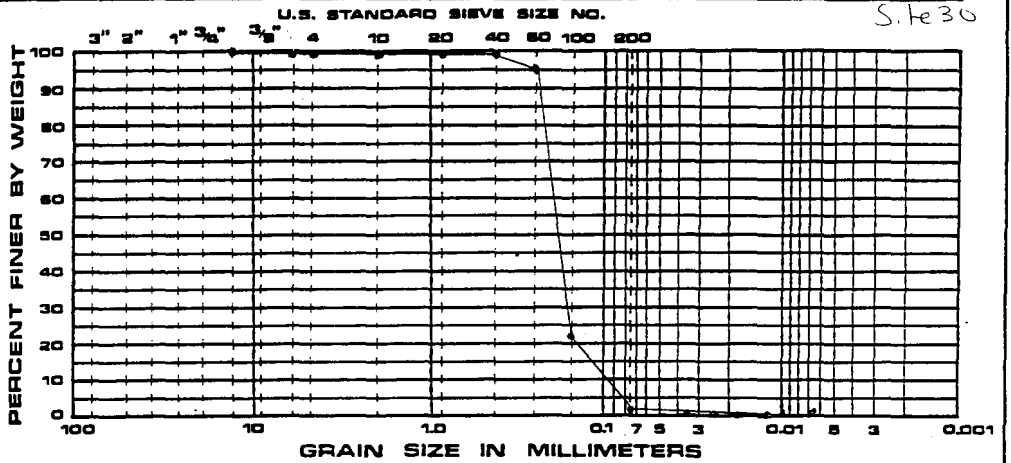
Sieve Size	Percent Passing	PROJECT Specifications %
1/2 "	100.0	
1/4 "	99.9	
# 4	99.9	
# 10	99.9	
# 20	99.9	
# 40	99.8	
# 60	95.2	
# 100	22.5	
# 200	1.0	

JOB NO: 77-000

GRAIN SIZE ANALYSIS

COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	

Site 30

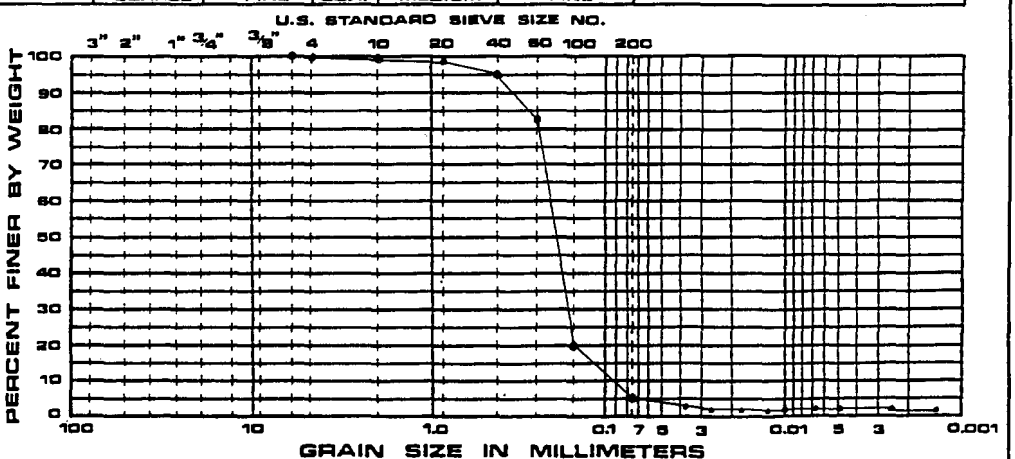


PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
•	WR8079-1	C32				

GRAIN SIZE ANALYSIS

Site 26

COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
•	WR8079-2	C33				

APPENDIX E

BORING LOG OF MONITORING WELL USED IN AQUIFER CHARACTERIZATION EVALUATION

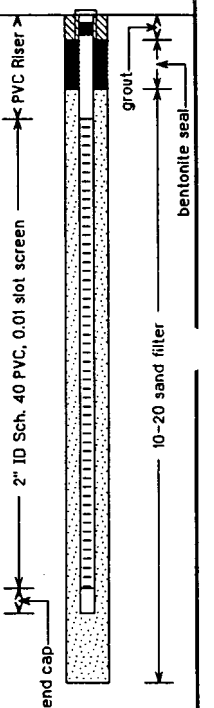
EnSafe/Allen & Hoshall

Monitoring Well NBCC047006

Project: *Zone C – Naval Base Charleston*	Coordinates: *2315164.71 E, 377240.48 N*
Location: *Charleston, SC*	Surface Elevation: *9.8 feet msl*
Started at *1330 on 4-5-95*	TOC Elevation: *12.27 feet msl*
Completed at *1445 on 4-5-95*	Depth to Groundwater: *7.53 feet TOC* Measured: *6-21-95*
Drilling Method: *4.25" ID (7.5" OD) HSA with split spoon*	Groundwater Elevation: *4.74 feet msl*
Drilling Company: *Alliance Environmental*	Total Well Depth: *12.1 feet bgs*
Geologist: *Peter Bayley*	Well Screen: *2.1 to 12.1 feet bgs*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Surface conditions: soil and grass	
							SP	Sand: brown to dark gray, very fine to fine with some medium, trace of silt, soft, wet at 3.5'.	6.8 / 6.1
5			1	37	0				
10			2	0	0		SP	Sand: gray with orange FeOx banding in upper 3", very fine to fine with trace medium, trace silt, soft, wet; more brown in upper 5".	2 / 1.7
			3	75	0				
							SP	Sand: brown to dark brown, very fine to fine, trace silt, soft, wet, some granule to pebbly layer at 13.2-13.4'.	3.2 / 3.9
15			4	37	0				
20									

WELL DIAGRAM



APPENDIX F

DOMENICO 10 YEAR AND 20 YEAR SIMULATION SPREADSHEETS AND SITE-SPECIFIC RBSL CALCULATIONS

SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 10-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_s = Saturated Hydraulic Conductivity	m/sec
i = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_s = Soil Bulk Density	g/cm^3
f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
α_X = Longitudinal Dispersivity = x/10	m
α_Y = Transverse Dispersivity = $\alpha_X/3$	m
α_Z = Vertical Dispersivity = $\alpha_X/20$	m
k_{OC} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_C = Constituent Retardation Factor	
V/R_C = Maximum Transport Rate of Dissolved Constituent = $\{K_s i\}/\{\theta R_C\}$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_S m/sec	i m/m	θ m^3/cm^3	ρ_S g/cm^3	α_X m	α_Y m	α_Z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-soil	V m/sec	R_C	C_{POE}/C_{SOURCE}
Naphthalene	45	13.7162	15	2	3.15E+08	1.43E-05	0.0150	0.47	1.45	1.37	0.46	0.07	4.83E-03	1543	7.444975	4.57E-07	23.969	2.392E-02

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	C_{SOURCE} mg/L	C_X mg/L
Naphthalene	0.410	0.010

Prepared By: _____

Reviewed By: _____

SITE 30, BUILDING NH 46
ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 20-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_s = Saturated Hydraulic Conductivity	m/sec
i = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Paramater Descriptions:	Units
ρ_s = Soil Bulk Density	g/cm^3
f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
α_X = Longitudinal Dispersivity = x/10	m
α_Y = Transverse Dispersivity = $\alpha_X/3$	m
α_Z = Vertical Dispersivity = $\alpha_X/20$	m
k_{OC} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_C = Constituent Retardation Factor	
V/R_C = Maximum Transport Rate of Dissolved Constituent = $(K_s i)/(\theta R_C)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_S m/sec	i m/m	θ m^3/cm^3	ρ_S g/cm^3	α_X m	α_Y m	α_Z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-soil	V m/sec	R_C	C_{POE}/C_{SOURCE}
Naphthalene	80	24.3843	15	2	6.31E+08	1.43E-05	0.0150	0.47	1.45	2.44	0.81	0.12	4.83E-03	1543	7.444975	4.57E-07	23.969	2.403E-02

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	C_{SOURCE} mg/L	C_X mg/L
Naphthalene	0.410	0.010

Prepared By: _____

Reviewed By: _____

ZONE C, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
Site 30

Groundwater SSTLs

Constituent	POE RBSLs mg/L	$SSTL_{SOURCE}$ mg/L	$SSTL_{COMP}$ mg/L
Naphthalene	0.01	0.010	5.658

$SSTL_{SOURCE}$ - Groundwater SSTLs in the source area protective of RBSLs at the off-site POE.
$SSTL_{COMP}$ - Groundwater SSTLs at the compliance well that are protective of RBSLs at the off-site POE.

Prepared By: _____ Reviewed By: _____

Minimum Construction Worker RBSLs

	Dermal	Incidental Ingestion	Inhalation	Minimum
	RBSL	RBSL	RBSL	RBSL
	mg/L	mg/L	mg/L	mg/L
Benzene	0.85	68.52	0.15	0.15
Ethylbenzene	6.05	2838.89	14.50	6.05
Naphthalene	1.63	1135.56	2.63	1.63

*No inhalation reference dose is available for xylenes; therefore, no inhalation RBSL can be calculated.

Prepared By: _____ Reviewed By: _____

Volatilization Factor: Groundwater to Ambient Air (VFwamb)

Chemical	Dair	Dwater	H	θ_{acap}	θ_{wcap}	θ_{as}	θ_{ws}	θ_T	Deff-cap	Deff-s
	cm^2/s	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Benzene	0.093	1.10E-05	2.20E-01	0.038	0.342	0.33	0.15	0.48	1.36E-05	1.01E-02
Ethylbenzene	0.076	8.50E-06	3.20E-01	0.038	0.342	0.33	0.15	0.48	9.39E-06	8.22E-03
Naphthalene	0.072	9.40E-06	4.90E-02	0.038	0.342	0.33	0.15	0.48	2.92E-05	7.79E-03

Chemical	hcap	hv	Deff-ws	Uair	δair	Lgw	W	VFwamb	TR (carc)	HI (nonc)
	cm	cm	cm^2/s	cm/sec	cm	cm	cm	$mg/m^3/mg/L$		
Benzene	5	117	3.22E-04	225	200	122	1500	1.94E-05	1.00E-06	NA
Ethylbenzene	5	117	2.23E-04	225	200	122	1500	1.95E-05	NA	1
Naphthalene	5	117	6.55E-04	225	200	122	1500	8.77E-06	NA	1

Chemical	BWadult	AT	Sfi (carc)	RfD (nonc)	IR air	EF	ED	RBSLair	RBSLwater
	kg	yr	$[mg/kg\text{-}day]^{-1}$	[mg/kg-day]	m^3/day	day/yr	yr	mg/m^3	mg/L
Benzene	70	70	2.90E-02	NA	20	90	1	3.43E-02	1769.4
Ethylbenzene	70	1	NA	2.86E-01	20	90	1	4.06E+00	2.08E+05
Naphthalene	70	1	NA	3.71E-04	20	90	1	5.27E-03	6.00E+02

Reference: American Society for Testing and Materials (ASTM). 1997. *Standard Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites* . Designation E 1739-95[ε1]

*No inhalation reference dose is available for xylenes; therefore, no RBSLs can be calculated.

= South Carolina value
= Site-specific value or based on site-specific value
= Calculated value
= ASTM default value
= Value from EPA Integrated Risk Information System
= Assumptions for construction worker scenario

Construction Worker Inhalation RBSLs

Chemical	Dair	Dwater	H	θ_{acap}	θ_{wcap}	θ_{as}	θ_{ws}	θ_T	Deff-cap	Deff-s
	cm^2/s	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Benzene	0.093	1.10E-05	2.20E-01	0.038	0.342	0.33	0.15	0.48	1.36E-05	1.01E-02
Ethylbenzene	0.076	8.50E-06	3.20E-01	0.038	0.342	0.33	0.15	0.48	9.39E-06	8.22E-03
Naphthalene	0.072	9.40E-06	4.90E-02	0.038	0.342	0.33	0.15	0.48	2.92E-05	7.79E-03

Chemical	hcap	hv	Deff-ws	Uair	δair	Lgw	W	VFwamb	TR (carc)	HI (nonc)
	cm	cm	cm^2/s	cm/sec	cm	cm	cm	$mg/m^3/mg/L$		
Benzene	5	117	3.22E-04	225	200	122	1500	1.94E-05	1.00E-06	NA
Ethylbenzene	5	117	2.23E-04	225	200	122	1500	1.95E-05	NA	1
Naphthalene	5	117	6.55E-04	225	200	122	1500	8.77E-06	NA	1

Chemical	BWadult	AT	Sfi (carc)	RfD (nonc)	IR air	EF	ED	RBSLair	RBSLwater
	kg	yr	$[mg/kg\text{-}day]^{-1}$	[mg/kg-day]	m^3/day	day/yr	yr	mg/m^3	mg/L
Benzene	70	70	2.90E-02	NA	20	90	1	3.43E-02	1769.4
Ethylbenzene	70	1	NA	2.86E-01	20	90	1	4.06E+00	2.08E+05
Naphthalene	70	1	NA	3.71E-04	20	90	1	5.27E-03	6.00E+02

*No inhalation reference dose is available for xylenes; therefore, no RBSL can be calculated for xylene.

Construction Worker Inhalation RBSLs

Chemical			Dair	Dwater	H	θ_{acap}	θ_{wcap}	θ_{as}	θ_{ws}	θ_T	Deff-cap	Deff-s
			cm^2/s	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Benzene			0.093	1.10E-05	2.26E-01	0.038	0.342	0.33	0.15	0.48	1.35E-05	1.01E-02
Ethylbenzene			0.076	8.50E-06	2.80E-01	0.038	0.342	0.33	0.15	0.48	9.85E-06	8.22E-03
Naphthalene			0.072	9.40E-06	2.00E-03	0.038	0.342	0.33	0.15	0.48	5.79E-04	7.83E-03

Chemical			hcap	hv	Deff-ws	Uair	δair	Lgw	W	VFwamb	TR (carc)	HI (nonc)
			cm	cm	cm^2/s	cm/sec	cm	cm	cm	$mg/m^3/mg/L$		
Benzene			5	117	3.18E-04	225	200	122	1500	1.97E-05	1.00E-06	NA
Ethylbenzene			5	117	2.34E-04	225	200	122	1500	1.79E-05	NA	1
Naphthalene			5	117	5.17E-03	225	200	122	1500	2.83E-06	NA	1

Chemical	TR (carc)	HI (nonc)	BWadult	AT	Sfi (carc)	RfD (nonc)	IR air	EF	ED	RBSLair	H	RBSLwater
			kg	yr	$[mg/kg\text{-}day]^{-1}$	[mg/kg-day]	m^3/day	day/yr	yr	mg/m^3	cm^3/cm^3	mg/L
Benzene	1.00E-06	NA	70	70	2.90E-02	NA	20	90	1	3.43E-02	2.26E-01	0.15
Ethylbenzene	NA	1	70	1	NA	2.86E-01	20	90	1	4.06E+00	2.80E-01	14.50
Naphthalene	NA	1	70	1	NA	3.71E-04	20	90	1	5.27E-03	2.00E-03	2.63

*No inhalation reference dose is available for xylenes; therefore, no RBSL can be calculated for xylene.

Prepared By: _____

Reviewed By: _____

Construction Worker Incidental Ingestion RBSLs

	BW	AT	IR	ED	EF	Target	CSF oral	Rfd oral	RBSL
	kg	day	L/day	yrs	days/yr	Risk or HQ			mg/L
Benzene	70	25550	0.01	1	90	1.00E-06	2.90E-02		6.85E+01
Ethylbenzene	70	365	0.01	1	90	1.0	NA	1.00E-01	2838.889
Naphthalene	70	365	0.01	1	90	1.0	NA	4.00E-02	1135.556

Prepared By: _____ Reviewed By: _____

Construction Worker Dermal RBSLs

	Kow	MW	Kp	B	τ_{event}	c	b	t*	t_{event}	DAevent
			cm/hr	unitless	hr/event			hr	hr/event	
Benzene	199.526231	78.1	0.11551543	0.39263786	2.87E-01	6.32E-01	6.03E-01	6.90E-01	1	eq 3.3
Ethylbenzene	1412.53754	106.2	0.5692198	2.25615488	4.13E-01	2.36E+00	4.39E+00	1.70E+00	1	eq 3.2
Naphthalene	1995.26231	128.2	0.60545239	2.63663896	5.48E-01	2.73E+00	5.69E+00	2.29E+00	1	eq 3.2

	BW	AT	EV	ED	EF	SA	CSF derm	Rfd derm	Target	RBSL	RBSL
	kg	day	events/day	yrs	days/yr	cm^2	$(mg/kg\text{-}day)^{-1}$	mg/kg-day	Risk or HQ	mg/L	mg/L
Benzene	70	25550	1	1	90	4500	2.99E-02	NA	1.00E-06		8.52E-01
Ethylbenzene	70	365	1	1	90	4500	NA	9.70E-02	1.0	6.05E+00	
Naphthalene	70	365	1	1	90	4500	NA	3.20E-02	1.0	1.63E+00	

Factor A	Factor 1	Factor 2
	7.18E-01	0.782661
1.01E+00		
1.24E+00		

* Kow and MW values for xylene, m-

Prepared By: _____ Reviewed By: _____

APPENDIX G

SOIL LEACHABILITY MODEL

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID #		COUNTY	Charleston
FACILITY NAME	Site 30, Building NH 46		
STREET ADDRESS	Charleston Naval Complex, North Charleston, SC		

Soil Risk Evaluation Data

					Figure
TPH		**5720**	mg/kg		
Soil % SAND (Estimated)		**97**	%		
Soil % CLAY (Estimated)		**3**	%		
Worst Case	Benzene	**0.34**	mg/kg	Cs	
Soil Analyses	Toluene		mg/kg	Cs	
	Ethylbenzene	**3.9**	mg/kg	Cs	
	Xylenes		mg/kg	Cs	
	Naphthalene	**50**	mg/kg	Cs	
	MTBE		mg/kg	Cs	
Natural Organic Carbon Content		**4825**	mg/kg	foc	
Average Annual Recharge		25	cm	Hw	
Distance from highest Soil Impact to water table		**76**	cm	L	
Bulk Density of Soil		1.45	g/cc	Bd	1
Wetting Front Suction		10	cm	Hf	2
Soil Hydraulic Conductivity		**1.43E-03**	cm/sec	Kf	3
Porosity		0.47	decimal %	Φ	4
Residual Water Content		0.04	decimal %	Wr	5

List possible human exposure pathways from surface soil.
Soil leaching to groundwater - utility trench

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 0
FACILITY NAME Site 30, Building NH 46

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: BENZENE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	16	days	t 1/2	1
Soil/water partitioning coefficient	81	ml/g	K oc	1

Results

				Equation Set	Step
Total Organic Carbon Content	0.0081	decimal %	f cs	I	1
Leachate Concentration	0.463	mg/l	C w	I	2
Air Filled Porosity	0.43	decimal %	f	II	1
Infiltration Rate Time	10,690	seconds	t	II	2
Velocity of Water	7,348	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.3908	ml/g	K d	III	1
Contaminant Percolation Rate	3,331	ft/year	V c	III	2
Time to Reach Groundwater	0.27	days	T c	IV	1
Concentration reaching Groundwater	0.1518	mg/l	C p	IV	2
Site Specific Target Level	**0.8912**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? NO

Risk of Human Exposure due to contaminated soil.

_____ **YES** X **NO**

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR BENZENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site: [redacted]

Location: [redacted]

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		BENZENE
Bd	Soil Bulk Density (1)	g/cm3	1.45
Crsbl	Risk Based Screening Level	mg/L	0.15
Cs	Concentration of COC in soil	mg/kg	0.34
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	4825
H'	Henry's Law Constant (4)	unitless	0.23
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25.00
Kf	Soil Hydraulic Conductivity (6)	cm/s	1.43E-03
Koc	Soil/Water Partioning Coefficient (2)	ml/g	81
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	76
Φ	Porosity (7)	unitless	0.47
t1/2	Biodegradation "half life" (2)	days	16
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	5720
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc +TPH/1.724)*1E-6 = 0.0081 decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc+Bd)/((Bd*Koc*fcs)+Wr+((ø-Wr)*H'))) = 0.4633 mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = Ø - Wr = 0.43 decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-((Hw-Hf)*(ln((Hw+L-Hf)/(Hw-Hf))))) = 10,690 seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = 7,348 ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 0.390825 ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw/(1+((Bd*Kd)/ø)) = 3,331 ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 0.27 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 0.1518 mg/l

COC concentration in soil pore water (Cp) is greater than concentration necessary to protect groundwater (Cw), therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for BENZENE in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H'''))/(Wr*1g/cc+Bd)) = 0.891201 mg/kg

PREPARED BY:_____

Date

CHECKED BY:_____

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 0
FACILITY NAME Site 30, Building NH 46

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: ETHYLBENZENE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	10	days	t 1/2	1
Soil/water partitioning coefficient	176	ml/g	K oc	1

Results

				Equation Set	Step
Total Organic Carbon Content	0.0081	decimal %	f cs	I	1
Leachate Concentration	1.01E-01	mg/l	C w	I	2
Air Filled Porosity	0.43	decimal %	f	II	1
Infiltration Rate Time	10,690	seconds	t	II	2
Velocity of Water	7,348	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.8492	ml/g	K d	III	1
Contaminant Percolation Rate	2,030	ft/year	V c	III	2
Time to Reach Groundwater	0	days	T c	IV	1
Concentration reaching Groundwater	6	mg/l	C p	IV	2
Site Specific Target Level	**75**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? NO

Risk of Human Exposure due to contaminated soil.

_____ **YES** X **NO**

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR ETHYLBENZENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site:	Site 30, Building NH 46
Location:	Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		ETHYLBENZENE
Bd	Soil Bulk Density (1)	g/cm3	1.45
Crsbl	Risk Based Screening Level	mg/L	6.05
Cs	Concentration of COC in soil	mg/kg	3.9
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	4825
H'	Henry's Law Constant (4)	unitless	0.28
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25
Kf	Soil Hydraulic Conductivity (6)	cm/s	0.0014
Koc	Soil/Water Partioning Coefficient (2)	ml/g	176
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	76
Ø	Porosity (7)	unitless	0.47
t1/2	Biodegradation "half life" (2)	days	10
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	5720
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc +TPH/1.724)*1E-6 = 0.0081 decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc+Bd)/((Bd*Koc*fcs)+Wr+((ø-Wr)*H'))) = 0.1010516 mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = Ø - Wr = 0.43 decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-(Hw-Hf))*(ln(Hw+((L-Hf)/(Hw-Hf)))) = 10,690 seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = 7,348 ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 0.8492 ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1+((Bd*Kd)/ø)) = 2,030 ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 0.45 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 6.24 mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for HYLBENZENE in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H'''))/(Wr*1g/cc+Bd)) = 75.009766 mg/kg

PREPARED BY:_____

Date

CHECKED BY:_____

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 0
FACILITY NAME Site 30, Building NH 46

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: NAPHTHALENE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	48	days	t 1/2	1
Soil/water partitioning coefficient	1543	ml/g	K oc	1

Results

				Equation Set	Step
Total Organic Carbon Content	0.0081	decimal %	f cs	I	1
Leachate Concentration	0.159	mg/l	C w	I	2
Air Filled Porosity	0.43	decimal %	f	II	1
Infiltration Rate Time	10,690	seconds	t	II	2
Velocity of Water	7,348	ft/year	V w	II	3
Soil/Water Distribution Coefficient	7.44	ml/g	K d	III	1
Contaminant Percolation Rate	307	ft/year	V c	III	2
Time to Reach Groundwater	3	days	T c	IV	1
Concentration reaching Groundwater	1.70	mg/l	C p	IV	2
Site Specific Target Level	**167**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? NO

Risk of Human Exposure due to contaminated soil.

_____ **YES** X **NO**

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR NAPHTHALENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site:	Site 30, Building NH 46
Location:	Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		NAPHTHALENE
Bd	Soil Bulk Density (1)	g/cm3	1.45
Crsbl	Risk Based Screening Level	mg/L	1.63
Cs	Concentration of COC in soil	mg/kg	50
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	4825
H'	Henry's Law Constant (4)	unitless	0.002
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25
Kf	Soil Hydraulic Conductivity (6)	cm/s	0.0014
Koc	Soil/Water Partioning Coefficient (2)	ml/g	1543
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	76
Ø	Porosity (7)	unitless	0.47
t1/2	Biodegradation "half life" (2)	days	48
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	5720
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc +TPH/1.724)*1E-6 = 0.0081 decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc+Bd)/((Bd*Koc*fcs)+Wr+((ø-Wr)*H'))) = 0.16 mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = Ø - Wr = 0.43 decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-(Hw-Hf))*(ln(Hw+((L-Hf)/(Hw-Hf)))) = 10,690 seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = 7348 ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 7.444975 ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1+((Bd*Kd)/ø)) = 307 ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 2.97 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 1.70 mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for APHTHALENE in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H'''))/(Wr^1g/cc+Bd)) = 166.805822 mg/kg

PREPARED BY:_____

Date

CHECKED BY:_____

Date

Katahdin
ANALYTICAL SERVICES

November 12, 1999

Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP-4272
Project ID: CTO #68
Project Manager: Ms. Andrea J. Colby
Sample Receipt Date: 10/13/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Confirmation
* Chain of Custody

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Patricia Homes
Authorized Signature

11/12/99
Date

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Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on October 13, 1999 and were logged in under Katahdin Analytical Services work order number WP4272 for a hardcopy due date of November 10, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample ID
WP4272-1	30SLB170708	9910461-01
WP4272-2	27SLB0701	9910461-02

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Two soil/sediment samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on October 13, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5972-F (methanol soil) and 5972-M (low level soil) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb.No matrix spike/matrix spike duplicate analysis was performed on either of the samples in this workorder.

Initial analysis of soil sample WP4272-1 yielded internal standard area recovery deviations and a concentration of the target analyte naphthalene over the upper limit of the calibration curve. Reanalysis yielded similar results, confirming matrix interference. A methanol preserved analysis was then performed successfully. All three sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed

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and approved by the GC/MS supervisor. Copies of each manual integration are included in thepertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Two soil/sediment samples were received by Katahdin Analytical Services laboratory on October 13, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the soil samples occurred following USEPA method 3550 on October 15, 1999. A laboratory control spike/laboratory control spike duplicate pair was extracted in the batch.

Analysis of sample WP4272-1 was performed at a 1:10 dilution due to matrix/chromatographic interferences and high target analyte concentrations, resulting in elevated reporting limits. This analysis also yielded a high recovery of the surrogate nitrobenzene-d5 due to the matrix.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP4272 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Soil-matrix Katahdin Sample No. WP4272-2 was digested for ICP analysis on 10/21/99 (QC Batch PJ21ICS0) in accordance with USEPA Method 3050B.

ICP analyses of Katahdin Work Order WP4272 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Soil-matrix Katahdin Sample No. WP4272-2 was digested for mercury analysis on 10/15/99 (QC Batch PJ15HGS1) in accordance with USEPA Method 7471A.

Mercury analyses of Katahdin Work Order WP4272 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

For work order WP4272 the analyses for Total Combustible Organics (TCO) have been performed in accordance with the "Annual Book of ASTM Standards", 1987. Analyses for Solids-Total Residue (TS) have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All analyses were performed within analytical hold time. No protocol deviations were noted by the Wet Chemistry laboratory staff.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
$	'$' flag denotes surrogate compound recovery is out of criteria. Re-extraction or re-analysis confirmed matrix interference.
B	'B' flag denotes detection of this analyte in the laboratory method blank analyzed concurrently with the sample.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-1	Sample dilution required due to matrix interference, sample viscosity or other matrix-related problem; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-4272-1
Report Date: 11/10/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
30SLB170708	Solid	P.CALLIGAN	10/12/99	10/13/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	92.	wt %	1.0	0.10	CLP/CIP SOW	10/18/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 10/15/99 by JF

11/10/99

LJO/baeajc(dw)/msm

CC: MS LEE LECK
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FOSTER PLAZA 7
661 ANDERSEN DR.

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11/12/99 15:27 FAX 2077754029 KATAHDIN ANALYTICAL 008

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4272-1
SDG: WP4272
Report Date: 11/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: EPA 8270
Date Analyzed: 10/18/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB170708	SL	10/12/99	10/13/99	10/15/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	11000	ug/Kg	11	3600	330
2-METHYLNAPHTHALENE	40000	ug/Kg	11	3600	330
ACENAPHTHYLENE	<3600	ug/Kg	11	3600	330
ACENAPHTHENE	J2600	ug/Kg	11	3600	330
FLUORENE	9600	ug/Kg	11	3600	330
PHENANTHRENE	14000	ug/Kg	11	3600	330
ANTHRACENE	<3600	ug/Kg	11	3600	330
FLUORANTHENE	<3600	ug/Kg	11	3600	330
PYRENE	J740	ug/Kg	11	3600	330
BENZO[A]ANTHRACENE	<3600	ug/Kg	11	3600	330
CHRYSENE	<3600	ug/Kg	11	3600	330
BENZO[B]FLUORANTHENE	<3600	ug/Kg	11	3600	330
BENZO[K]FLUORANTHENE	<3600	ug/Kg	11	3600	330
BENZO[A]PYRENE	<3600	ug/Kg	11	3600	330
INDENO[1,2,3-CD]PYRENE	<3600	ug/Kg	11	3600	330
DIBENZ[A,H]ANTHRACENE	<3600	ug/Kg	11	3600	330
BENZO[G,H,I]PERYLENE	<3600	ug/Kg	11	3600	330
NITROBENZENE-D5	#134	%	11		
2-FLUOROBIPHENYL	92	%	11		
TERPHENYL-D14	77	%	11		

Report Notes: J, #, O-1, O-2

11/12/99 15:27 FAX 2077194029 KATAHDIN ANALYTICAL 009

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4272-1
SDG: WP4272
Report Date: 11/3/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: SW8260
Date Analyzed: 10/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB170708	SL	10/12/99	10/13/99	10/13/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.1	6	5
TOLUENE	<6	ug/Kg	1.1	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.1	6	5
ETHYLBENZENE	200	ug/Kg	1.1	6	5
NAPHTHALENE	E1500	ug/Kg	1.1	6	5
MTBE	<6	ug/Kg	1.1	6	5
TOTAL XYLENES	150	ug/Kg	1.1	6	5
DIBROMOFLUOROMETHANE	136	%	1.1		
1,2-DICHLOROETHANE-D4	142	%	1.1		
TOLUENE-D8	94	%	1.1		
P-BROMOFLUOROBENZENE	87	%	1.1		

Report Notes: E,INTERNAL STANDARD AREA RECOVERY DEVIATIONS

11/12/99 15:28 FAX 2077754029 KATAHDIN ANALYTICAL 010

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4272-1RA
SDG: WP4272
Report Date: 11/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: SW8260
Date Analyzed: 10/14/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB170708	SL	10/12/99	10/13/99	10/14/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	E460	ug/Kg	1.2	6	5
NAPHTHALENE	BE2200	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	360	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	176	%	1.2		
1,2-DICHLOROETHANE-D4	$211	%	1.2		
TOLUENE-D8	96	%	1.2		
P-BROMOFLUOROBENZENE	$161	%	1.2		

Report Notes: B, E, $

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4272-1DL
SDG: WP4272
Report Date: 11/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: SW8260
Date Analyzed: 10/14/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
30SLB170708	SL	10/12/99	10/13/99	10/14/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<300	ug/Kgdrywt	60	300	5
TOLUENE	<300	ug/Kgdrywt	60	300	5
1,2-DIBROMOETHANE	<300	ug/Kgdrywt	60	300	5
ETHYLBENZENE	490	ug/Kgdrywt	60	300	5
NAPHTHALENE	5900	ug/Kgdrywt	60	300	5
MTBE	<300	ug/Kgdrywt	60	300	5
TOTAL XYLENES	470	ug/Kgdrywt	60	300	5
DIBROMOFLUOROMETHANE	114	%	60		
1,2-DICHLOROETHANE-D4	115	%	60		
TOLUENE-D8	102	%	60		
P-BROMOFLUOROBENZENE	113	%	60		

Report Notes:

11/12/99 18:26 FAX 2017/940629 KATAHDIN ANALYTICAL 012

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: November 04, 1999

Sample ID	: 30SLB170708
Lab ID	: 9910461-01
Matrix	: Soil
Date Collected	: 10/12/99
Date Received	: 10/13/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		16700	110	220	mg/kg	1.0	AAT	10/15/99	1030	160780	1
Evaporative Loss @ 105 C		9.00	1.00	1.00	wt%	1.0	GJ	10/18/99	1620	160962	2

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

11/12/99 15:01 FAX 2077734029 KATAHDIN ANALYTICAL 019