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CONTAMINATION ASSESSMENT REPORT FOR SITE 323 CSS PANAMA CITY FL
12/1/1996
BROWN AND ROOT ENVIRONMENTAL

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Contamination Assessment Report
for
Site 323

Coastal Systems Station
Panama City, Florida

REC'D JAN 06 1997

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888

Contract Task Order 0008

December 1996

CONTAMINATION ASSESSMENT REPORT
FOR SITE 323

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:
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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0008

December 1996

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EXECUTIVE SUMMARY
of
CONTAMINATION ASSESSMENT for
Coastal Systems Station Site 323
Panama City, Florida
Facility ID No. 038518667

Brown & Root Environmental (B&R Environmental) has completed a Contamination Assessment (CA) at the above-referenced facility in accordance with the requirements of Chapter 62-770, Florida Administrative Code (FAC). The assessment report was submitted to the Florida Department of Environmental Protection for approval.

B&R Environmental performed the following tasks during the CA:

- Reviewed available Navy documents to identify potential sources and receptors for petroleum hydrocarbons in the vicinity, to evaluate private potable wells in a 0.25-mile radius and public supply water supply wells within 0.50-mile radius, and to locate nearby surface water bodies, and to determine surface hydrology and drainage;
- Reviewed soil data collected during removal of the oil/water separator to determine boring locations and monitoring well placements;
- Conducted site survey to identify utilities and to construct a site plan;
- Performed excavation of 14 soil borings for organic vapor analysis;
- Installed three shallow temporary groundwater monitoring points and collected groundwater samples for field screening with a portable gas chromatograph;
- Advanced one shallow permanent monitoring well to approximately 15 feet below land surface (bls);
- Collected groundwater samples from the permanent monitoring well for laboratory analysis for Gasoline and Kerosene Analytical Group parameters, including used oil parameter testing;
- Collected one composite soil sample for analysis of Metals, Priority Pollutant Volatile Organics, Priority Pollutant Extractable Organics, Non-priorty Pollutant Organics and Total Recoverable Hydrocarbons (TRPH) as required by Chapter 62-770.600(8)(c).

The results of the CA identified no "excessively contaminated" soil at the site, as defined by Chapter 62-770.200 FAC. Low levels of Total Volatile Organic Aromatics (VOAs) and TRPH were detected in the groundwater at concentrations below State Action Levels. All other groundwater parameters tested were

reported below State Action Levels. All soil parameters tested were reported at levels which meet FDEP clean soil criteria. Based on the results of the CA, B&R Environmental proposes the site be granted a **No Further Action** status.

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

A Contamination Assessment (CA) was conducted by Brown and Root Environmental (B&R Environmental) for the U.S. Navy (Navy) Southern Division Naval Facilities Engineering Command under Contract Task Order 0008, for the Comprehensive Long-term Environmental Action Navy (CLEAN III), Contract Number N62467-94-D-0888. The CA was conducted at Site 362 located at the Coastal Systems Station (CSS) in Panama City, Florida. The Florida Department of Environmental Protection (FDEP) Facility Identification Number is 038518667.

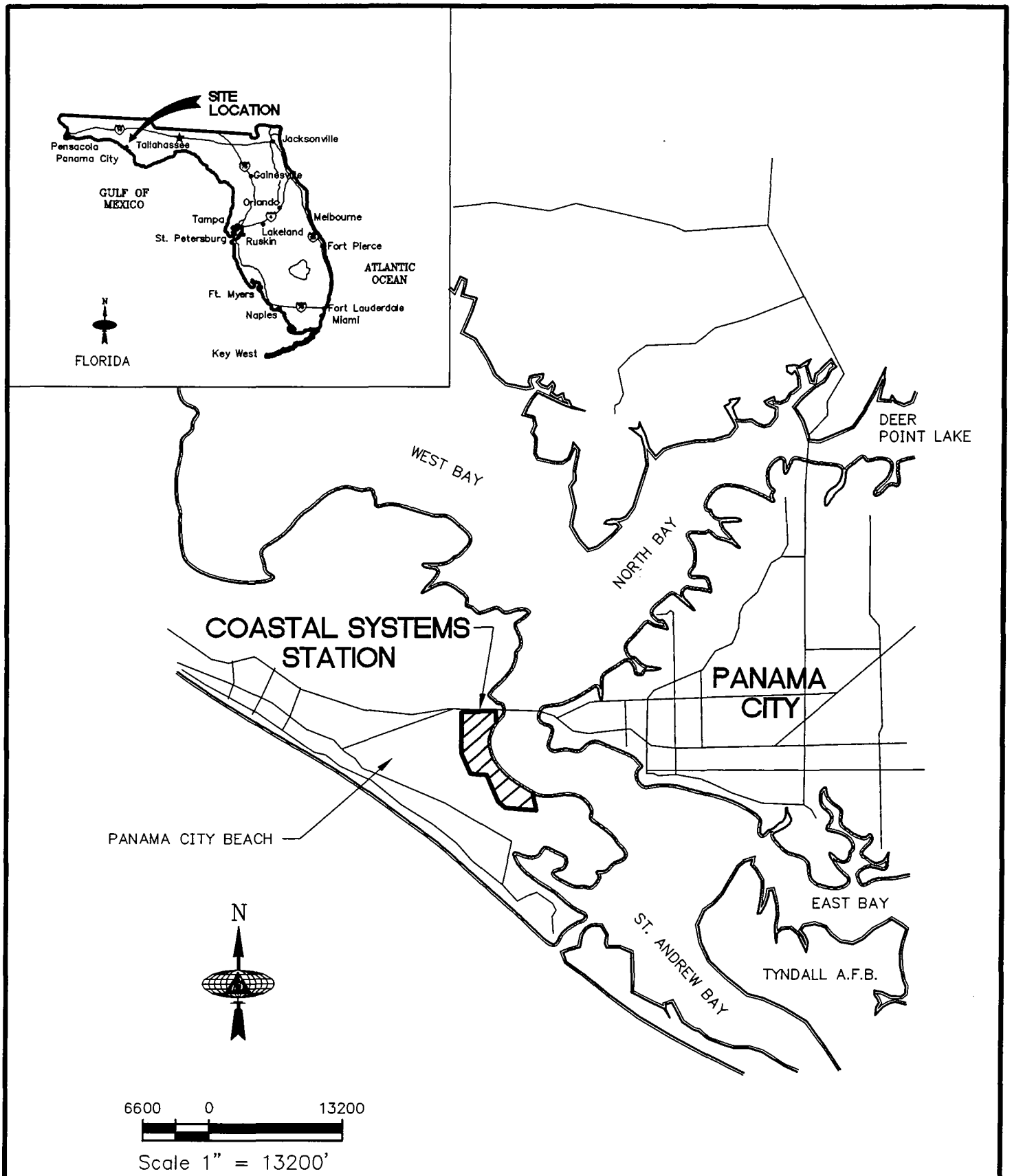
The purpose of this CA was to determine the nature and extent of petroleum hydrocarbons and used oil constituents on soil and groundwater in accordance with the requirements of Chapter 62-770 of the Florida Administrative Code (FAC). The Navy submitted a Discharge Notification Form (DNF) to the Bay County Health and Rehabilitative Services (HRS), Environmental Health Services Pollution Storage Tank Program on February 16, 1994. The discharge was reported based on soil vapor readings detected during removal of the site's oil/water separator. The DNF listed the type of substance used waste oil, diesel fuel, and jet fuel. The cause of the leak was reported on the DNF as unknown. A copy of the DNF report is included as Appendix A.

A CAR Summary Sheet, as required by Chapter 62-770, FAC is included as Appendix B.

1.2 SITE DESCRIPTION

1.2.1 Location

The CSS facility is located on the western shore of St. Andrew Bay in Panama City, Bay County, Florida. The facility is bounded by U.S. Highway 98 to the north, St. Andrew Bay to the east, State Road 292B (Magnolia Beach Road) to the south, and State Road 292 (Thomas Drive) to the west as shown on Figure 1-1. Specifically, the CSS facility is located within Section 33 of Township 3 South, Range 15 West and Section 4 of Township 4 South, Range 15 West, as shown on United States Geological Survey (USGS) Panama City Beach Quadrangle Florida 7.5 Minute Series (Topographic) presented as Figure 1-2.



MODIFIED RCRA FACILITY INVESTIGATION REPORT

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SCALE: 1" = 2.5 MI.	
CAD DWG. NO.: 323–VM	PROJ. NO.: 7113

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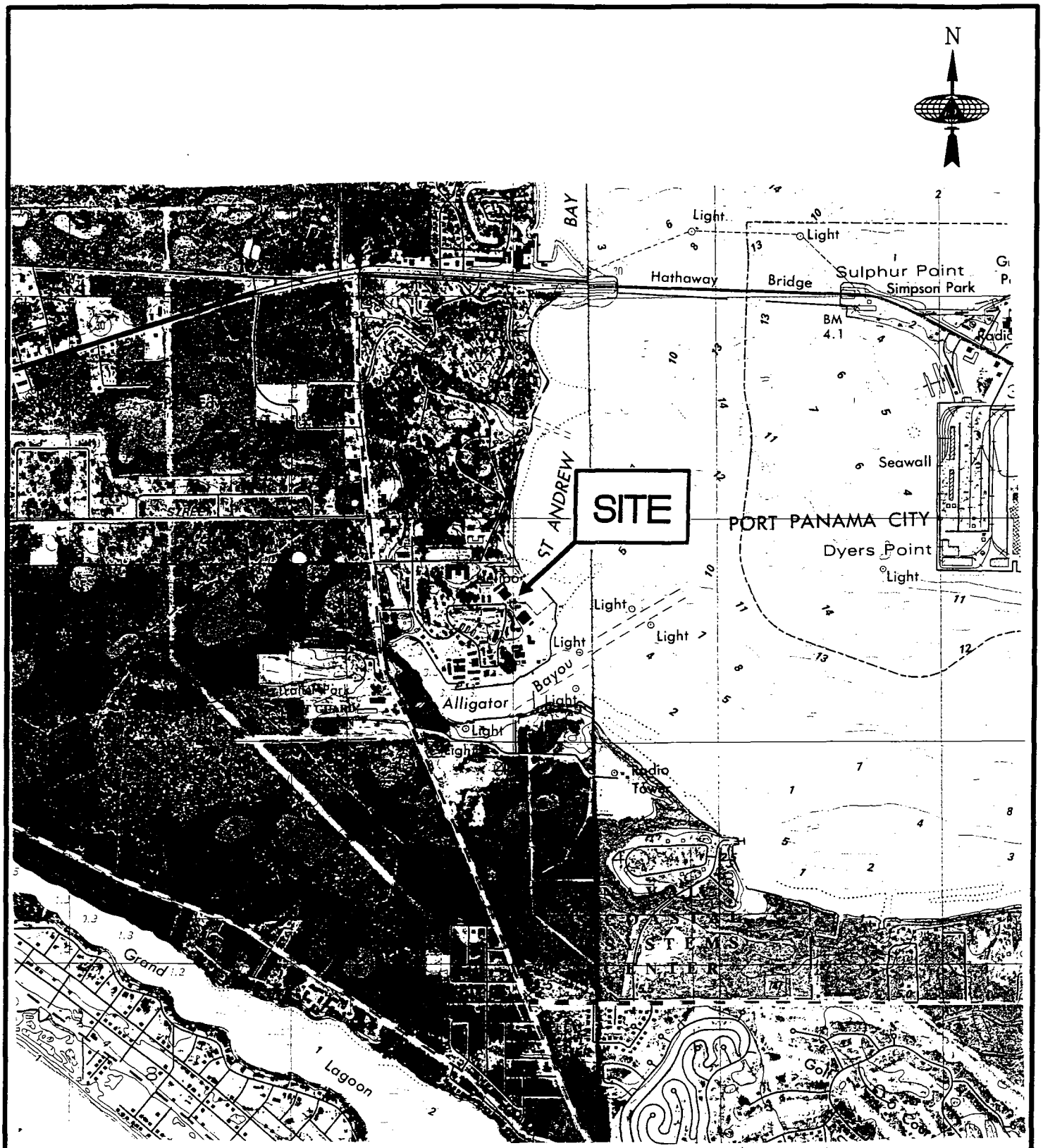
FIGURE 1–1

SITE VICINITY MAP
SITE 323

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



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KILOMETERS 1 .5 0 1 2
METERS 1000 0 1000 2000
MILES 1 .5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10 000

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CAD DWG. NO.: 323–VM	PROJ. NO.: 7113

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FIGURE 1–2
SITE LOCATION
SITE 323
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

1.2.2 Topography and Drainage

The topography at the site is relatively flat with a gentle surface slope towards the northeast. The site is located at an elevation of approximately 12 feet above National Geodetic Vertical Datum (NGVD). The land surface area where the former oil/water separator was located is capped by a concrete surface. Surface drainage from this area is towards a grass area located approximately 25 feet northeast of the former oil/water separator location. Surface water also drains toward Bullfinch Road which borders the site to the north. The nearest surface water body is St. Andrew Bay which is located approximately 450 feet east of the former oil/water separator location. St. Andrew Bay is designated as a Class III surface water by the State of Florida, suitable for fish and wildlife propagation and water sports (ABB Environmental Services Inc., RCRA Facility Investigation Report. 1995).

1.2.3 Regional Hydrogeology

The regional hydrogeology of CSS Panama City is described in the RCRA Facility Investigation Report (ABB Environmental Services, Inc., 1995). According to this report, surficial deposits at CSS are Pleistocene to Recent coastal plain sediments of marine and estuarine origin. They predominately consist of quartz sand, clayey sand, and gravel. These deposits vary in thickness from 70 to 100 feet in Bay County. The surficial aquifer is located within these deposits.

Underlying the surficial deposits is the Intercoastal Formation of middle Miocene to late Pliocene. The Intercoastal Formation is composed of sand and poorly consolidated limestone interbedded with discontinuous clay and low permeability sandy limestone. This formation is approximately 150 feet thick at CSS Panama City. The lower beds of the Intercoastal Formation are part of the Floridan aquifer system.

Groundwater at CSS occurs in two major aquifer systems: unconfined surficial aquifer and the Floridan aquifer system, which is under confined and artesian conditions. A third semi confined aquifer exists in thin permeable sand and shell zones within the Intercoastal Formation, and is separated from the water table aquifer and from the Floridan aquifer system by interbedded low-permeability clay and limestone. The Intercoastal Formation does not produce enough water to be considered a significant water source. The Floridan aquifer is under confined and artesian conditions where low-permeable clays and limestone beds of the Intracoastal Formation separate the water table aquifer from the Floridan aquifer. The surficial aquifer is reported to have insufficient thickness to produce significant quantities of water and its quality is generally undesirable for human use (i.e., dissolved solids, acidity, and iron content). Low

permeability clay lenses in the surficial aquifer and the Intercoastal Formation are discontinuous, the surficial aquifer may be hydraulically connected to the Floridan aquifer system through semiconfining strata of the Intercoastal Formation.

1.2.4 Land Use

Site 323 is located in the southeast area of the CSS property as shown on Figure 1-3. This area of the base is comprised of research facilities and various support activities. No regulated underground storage tank systems are located at facilities adjacent to Site 323 (E.C. Jordan Company, Release Detection Program For Underground Storage Tanks, May 1990). St. Andrew Bay is located approximately 450 feet east of the site.

1.2.5 Site Description

Site 323 consisted of an unregulated oil/water separator tank which was located on the northeast side of Building 323 as shown on Figure 1-4. The oil/water separator and drain piping was removed in March 1994 to accommodate a building addition being added onto Building 323. A new oil/water separator has been installed at the site and is located northeast of the former oil/water separator location, as shown on Figure 1-4.

Prior to removal, the oil/water separator collected fluids from both the motor pool catch basin for Building 5 and a floor drain for Building 323. Building 5 is located approximately 70 feet southwest of Building 323. Building 323 was utilized for light industrial mechanical work, including the prefabrication of hydraulic wenches. It is unknown if hydraulic oils used at Building 323 or solvents which may have been used during cleaning of the wenches, entered the floor drain. It is unknown what types of degreasers may have been used at the motor pool at Building 5. (Mike Clayton, February 2, 1996).

The former oil/water separator unit was 16 feet in length by 5 feet 4-inches wide, by 6 feet 8 inches in depth. The top of the unit was located at land surface grade and the bottom of the unit was situated on top of a 6-inch thick concrete foundation. (NAVFAC Drawing No. 5239420) The oil/water separator operated via gravity flow and contained no safety shut off devices. Water from the unit drained into the Navy's sanitary sewer system.

The new oil/water separator system consists of a 100 gallon per minute (gpm) oil/water separator and contains a 650 gallon internal reclaimed oil tank. The top of the new unit is installed flush with land surface (NAVFAC Drawing No. 5239421).

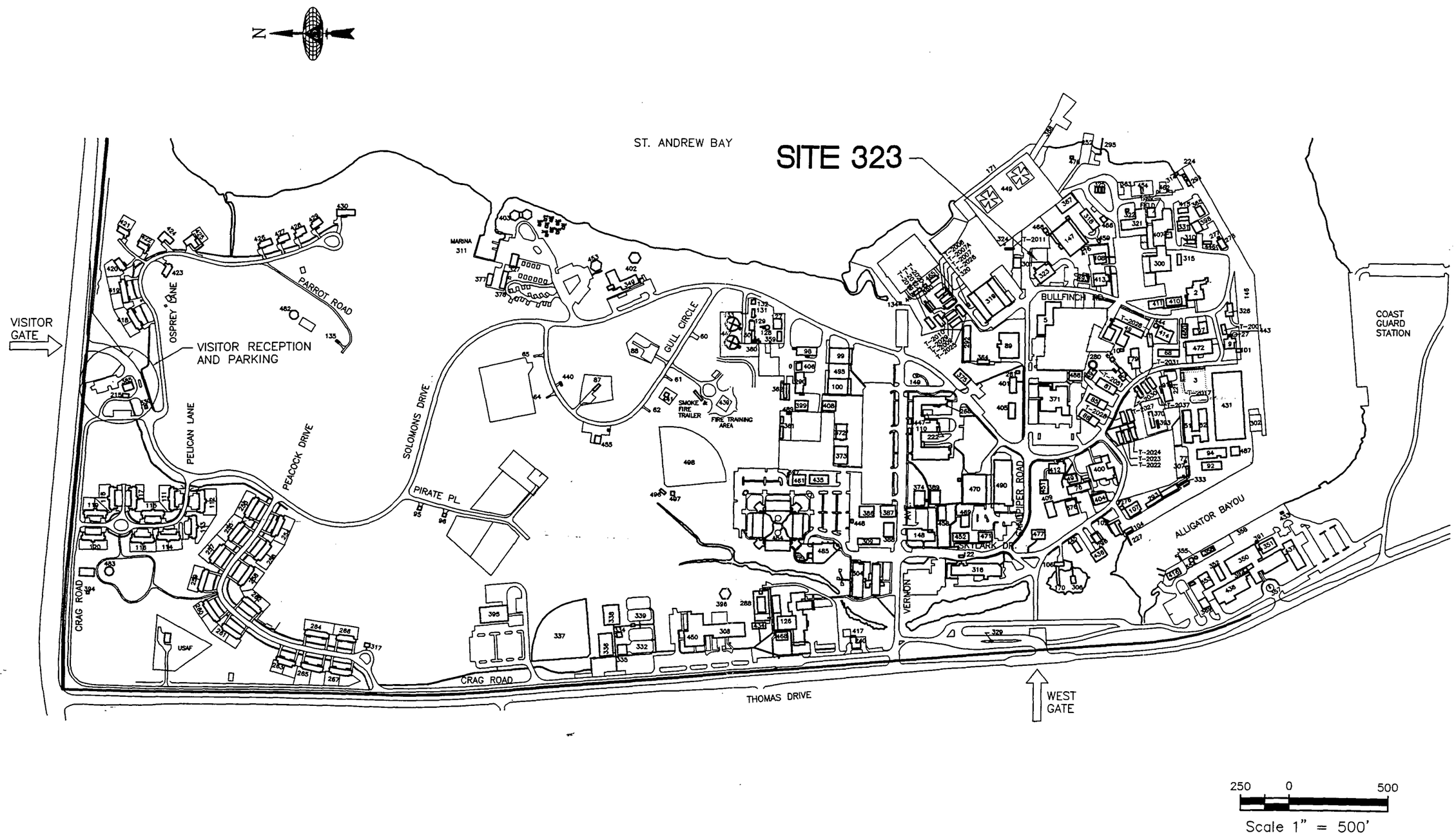

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FIGURE 1–3
NAVAL FACILITY SITE LOCATION
SITE 323
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

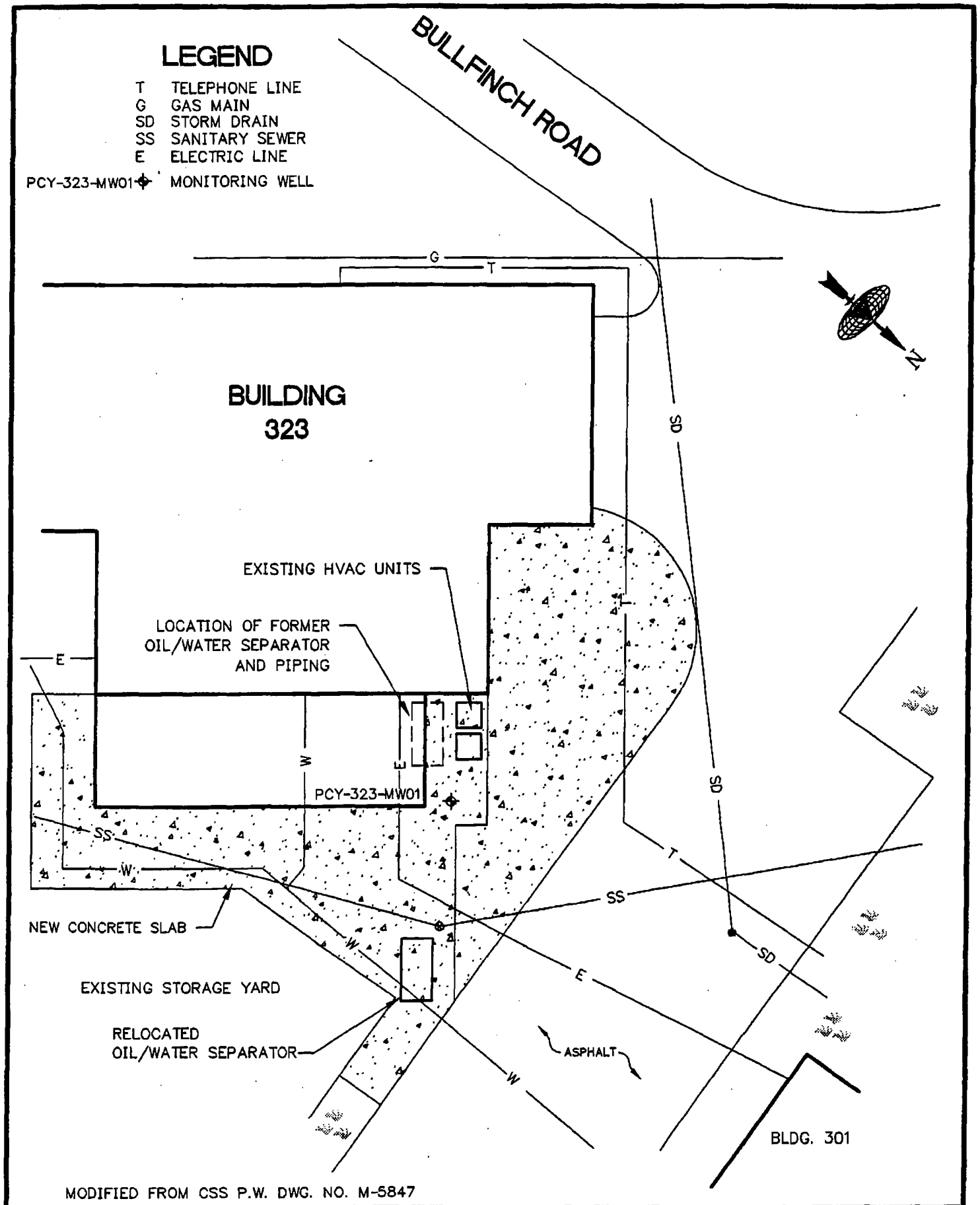

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FIGURE 1-4
SITE PLAN
SITE 323
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

1.2.6 Potable Water Well Survey

The potable water supply information presented in this report was obtained from the Resource Conservation and Recovery Act (RCRA) Facility Investigation completed for CSS (ABB Environmental Services Inc., 1995). According to this report, potable water for most of Panama City and Panama City Beach, including CSS, is supplied by surface water. Panama City Beach also uses groundwater from the Floridan aquifer system, as do private and domestic water systems throughout Bay County.

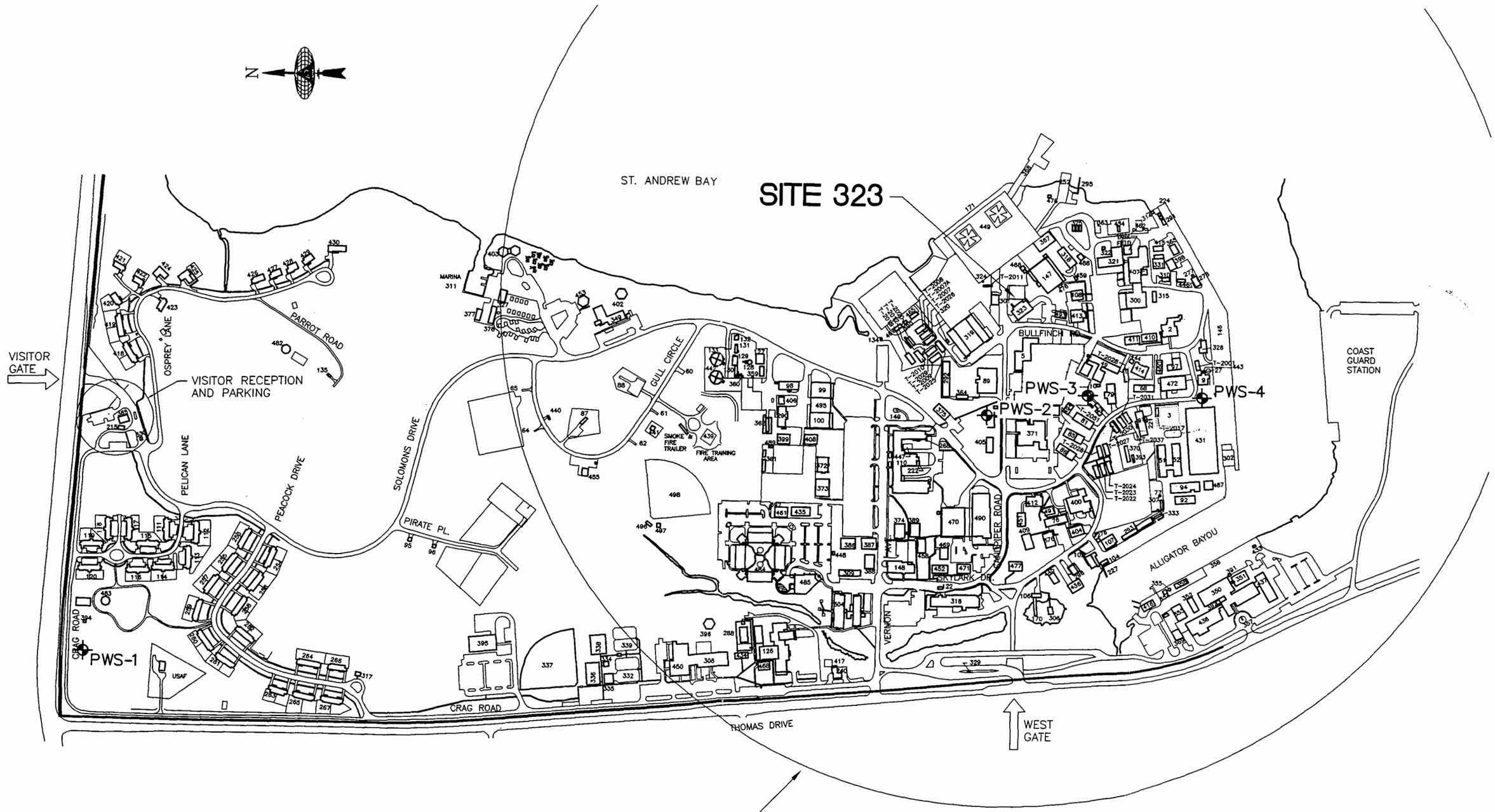
The CSS is provided potable water from the Bay County Water System, operated by the Bay County Public Utilities Department. The system draws surface water from Deer Point Lake, located 7 miles northeast of CSS. The use of county water in urban areas such as Panama City, has been reported at 83 to 95 percent.

Panama City Beach operates a public water system which uses a combination of groundwater withdrawal and surface water. The groundwater is obtained from 13 wells located in western Bay County and surface water is purchased from the county water system.

The RCRA Facility Investigation Report indicate records from the Northwest Florida Water Management District list 42 permitted wells screened in the surficial aquifer system in the vicinity of CSS. These 42 wells are classified as domestic or other public supply. The permitted wells are 2-inch and 4-inch diameter wells with capabilities generally less than 20 gallons per minute.

Four public water supply wells are located at CSS. The location of the wells are provided on Figure 1-5. These wells have 12-inch diameter casings and are completed at depths of 350 to 400 feet below land surface (bls). Of the four wells, only PWS-1, located near the housing area at Building 394 adjacent to highway 98, is currently in use. It is used to provide water for air conditioning and heat pumps only and draws water from the Floridan aquifer system at approximately 400 feet bls. The remaining wells are inactive.

No private potable wells or public potable supply wells were identified in the RCRA Facility Investigation Report as being within a 1/4-mile and 1/2-mile radius of the site, respectively.



LEGEND

PWS-1 PUBLIC WATER SUPPLY WELL

MODIFIED RCRA FACILITY INVESTIGATION REPORT

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SCALE: 1" = 500'	
CAD DWG. NO.: 323–PWEL	PROJ. NO.: 7113

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FIGURE 1–5
LOCATION OF PUBLIC WATER SUPPLY WELLS
SITE 323
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

1.3 SITE HISTORY AND OPERATIONS

1.3.1 Site History

CSS is one of seven major research, test, and evaluation laboratories of the Space and Naval Warfare Systems Command. The site was first established in 1942 as a harbor for World War II convoy ships and as a liaison with a nearby shipyard. It later became an amphibious landing craft operations school. Research and development began in 1945 when a facility was renamed the U.S. Navy Research Countermeasures Station. In 1952 a research and development program for the use of helicopters for mine countermeasures operations was implemented at the Base. The facility was redesignated as the Naval Coastal Systems Center in 1978 and again as Coastal Systems Station in January 1992 (ABB Environmental Services, Inc. 1995).

Site 323 is used for light industrial mechanical work. An oil/water separator system located on the northeast side of the building is used to collected fluids from both the motor pool catch basin for Building 5 and a floor drain for Building 323.

In March 1994, the oil/water separator was removed and a new oil/water separator unit was installed northeast of Building 323. The new unit continues to provide as a collection system for the motor pool drain in Building 5 and the floor drain in Building 323. Water from the oil/water separator drains into the Navy's sanitary sewer system.

1.3.2 Structural Integrity of Tanks and Lines

No structural integrity testing on the oil/water separator tank and lines were performed prior to removal.

1.3.3 Previous Investigations

On Feburary 16, 1994, Southern Earth Sciences, Inc. collected soil samples for hydrocarbon vapor screening using an organic vapor analyzer (OVA). The soil samples were collected from around the perimeter of the oil/water separator excavation and from the center of the tank excavation. Results of the soil vapor screening identified excessively contaminated soil, as defined by Chapter 62-770.200 FAC., in the area of the tank excavation. Hydrocarbon vapor concentrations in the soil samples ranged from 14 parts per million (ppm) to 166 ppm. During tank removal activities, a sludge sample was collected from inside the oil/water separator and analyzed for TCLP 8 RCRA metals, volatile organics, semivolatiles, herbicides, and pesticides. Results of the analysis reported all constituents below detection limits. The laboratory data sheet for the sludge analysis is provided in Appendix C. The

location of the soil samples and corresponding soil vapor readings are provided in Appendix D.

On March 9, 1994, Southern Earth Sciences collected additional soil samples for soil vapor screening at the former oil/water separator location. These soil samples were collected after 16 cubic yards of soil were removed from the former oil/water separator excavation and transported to Bay County Landfill for disposal. Samples were collected at depths of 5 feet around the excavation perimeter and at a depth of 7 feet from the bottom of the excavation. Excessive hydrocarbon vapor readings were reported in each of the samples. The highest hydrocarbon vapor concentrations were reported at the northeast and west side of the excavation at 238 and 240 ppm, respectively. The location of the soil samples and corresponding soil vapor readings are provided in Appendix D.

2.0 SUBSURFACE INVESTIGATION METHODS

2.1 QUALITY ASSURANCE

The site investigation was conducted in accordance with the Standard Operating Procedures prescribed by the FDEP Quality Assurance Section Document DER-001/92, and adopted by the B&R Environmental Comprehensive Quality Assurance Plan Number 870055G.

2.2 SOIL BORINGS PROCEDURES

2.2.1 Hand-Auguered Soil Borings

A soil hydrocarbon vapor assessment was conducted at the site by B&R Environmental on June 14 and 15, 1996. Thirteen soil borings (SB01 through SB13) were excavated in the immediate area surrounding the former oil/water separator. Soil samples were collected from each boring for the purpose of organic vapor screening and for lithologic description. Results of the soil vapor screening were collaborated with the soil vapor data collected during removal of the oil/water separator to determine the horizontal and vertical extent of petroleum contamination in the vadose zone. Soil borings were advanced using a 3.5 inch inner diameter (ID) stainless steel bucket auger. Soil samples were collected at two foot intervals until the water table was encountered. Wet soils were present at depths ranging from approximately 6 to 7 feet bls. Several soil borings terminated above the water table due to auger refusal. On July 12, 1996, an additional soil boring, SB14, was conducted to collect a composite soil sample for laboratory analysis. Soil boring locations and boring completion depths are summarized on Figure 2-1 and Table 2-1, respectively. Soil boring logs are provided in Appendix E.

Prior to the advancement of the hand auger at each boring location, the hand auger was decontaminated using the following procedure:

- Laboratory grade detergent and potable water wash
- Potable water rinse
- Isopropanol rinse
- Deionized water rinse
- Air dry

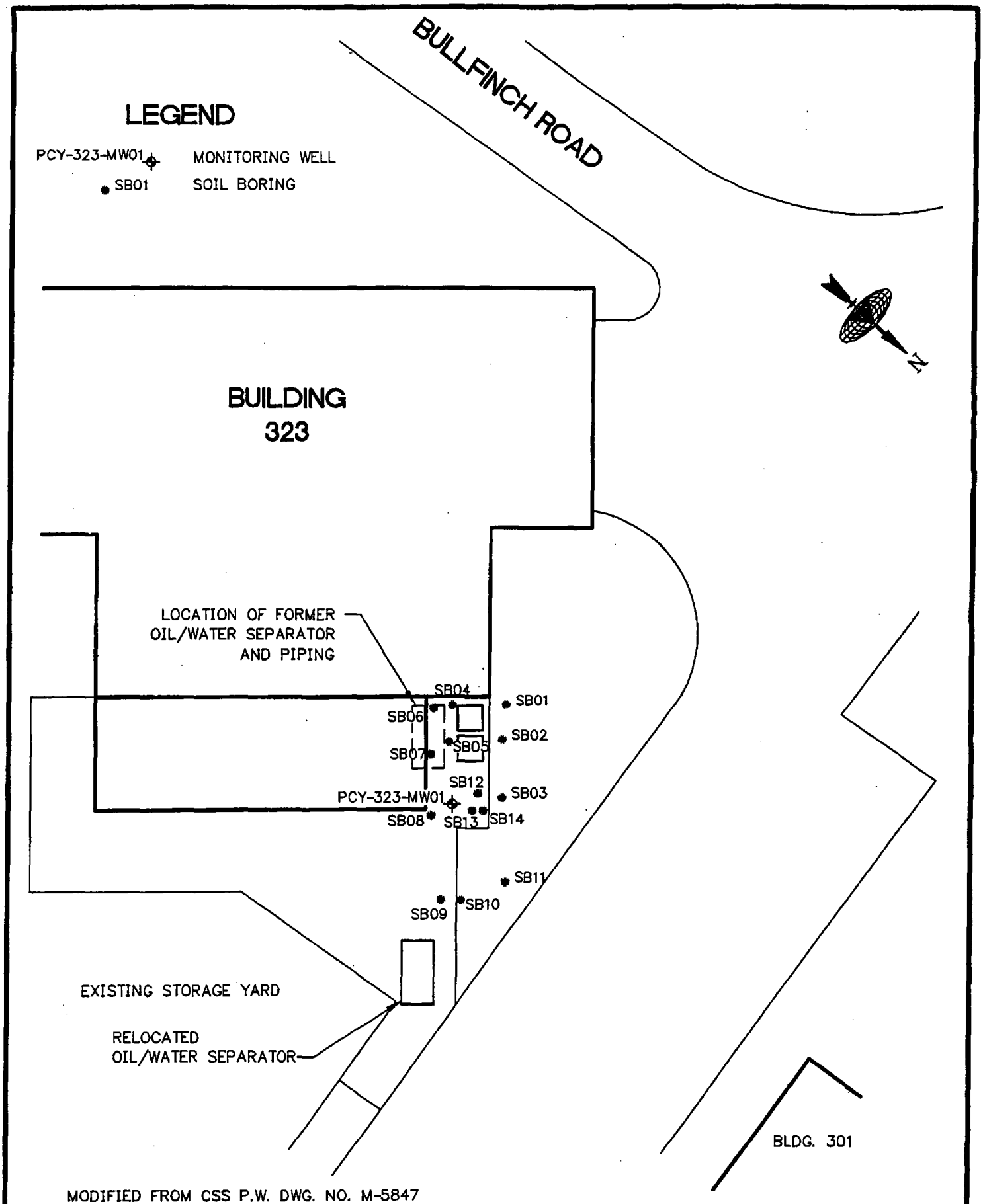

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FIGURE 2-1
SOIL BORING LOCATIONS
SITE 323
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

TABLE 2-1
SOIL VAPOR MEASUREMENTS
Coastal Systems Station
Site 323
Panama City, Florida
FDEP FACILITY No. 038518667

Soil Boring No.	Date of Measurement	Sample Interval (feet bls)	Headspace Readings (ppm)		
			Total Organic Reading	Carbon Filtered Reading	Net Reading
SB01	06-14-96	2	5	5	ND
		4	ND	-	ND
		6	ND	--	ND
SB02	06-14-96	2	ND	-	ND
		4	ND	-	ND
		6	ND	-	ND
SB03	06-14-96	2	1	ND	1
		4	ND	ND	ND
		6	23	5	18
SB04	06-14-96	2	ND	-	ND
		4	ND	-	ND
		6	ND	-	ND
SB05	06-15-96	2	ND	-	ND
		4	ND	-	ND
		auger refusal at 5 feet bls.			
SB06	06-14-96	2	3	ND	3
		auger refusal at 2.5 feet bls.			
SB07	06-14-96	2	11	1	10
		auger refusal at 3 feet bls.			
SB08	06-14-96	2	20	ND	20
		auger refusal at 3 feet bls			
SB09	06-14-96	2	ND	-	ND
		4	8	3	5
		auger refusal at 6 feet bls.			
SB10	6-14-96	2	25	10	15
		4	13	8	5
		6	19	3	13
SB11	6-14-96	2	4	ND	4
		4	ND	ND	ND
		6	300	5	295
SB12	6-15-96	2	ND	-	ND
		auger refusal at 2.5 feet bls.			
SB13	6-15-96	2	ND	ND	ND
		4	5	3	2
		6	380	12	368
SB14	7-12-96	2	3	ND	3
		4	5	ND	5
		6	5	ND	5
PCY-323-MW01	06-14-96	2	ND	-	ND
		4	ND	-	ND
		6	120	6	115

Notes:
- = not analyzed
bls = below land surface
ppm = part per million equivalent methane
Wet soils encountered at approximately 6 to 7 feet bls.

2.2.2 Drilling and Soil Sampling Methods

On June 14, 1996, monitoring well PCY-323-MW01 was drilled by Groundwater Protection, Inc. under the supervision of B&R Environmental geologist. The boring was advanced to facilitate the installation of a groundwater monitor well. Soil samples collected during borehole advancement were used to characterize the site lithology and provide additional assessment data on soil hydrocarbon vapor concentrations in the area. The location of the borings are shown on Figure 2-1, and soil boring logs are included in Appendix E.

Buried utilities were investigated at each boring location by advancing the soil boring with a post hole digger from 0 to 4 feet bls. The borings were continued with a truck mounted drill rig, using 4 1/4-inch inside diameter (ID) hollow stem augers. Soil samples were collected using a split spoon sampler and standard penetrations tests were conducted in accordance with the American Society for Testing and Materials (ASTM) recommended procedures.

Prior to the collection of the soil samples, the split spoons were decontaminated using the following procedures:

- Laboratory grade detergent and potable water wash
- Potable water rinse
- Isopropanol rinse
- Deionized water rinse
- Air dry

Prior to drilling at each boring location, the auger flights, drill rods, and split spoons were steam cleaned.

Headspace analysis was conducted on each soil sample collected above the water table during the soil vapor assessment. Grab samples were collected at two foot intervals from approximately 0 to 4 feet bls. Soil vapor analysis was performed in accordance with the headspace method presented in detail in Appendix F. Hydrocarbon vapor concentrations from soil vapor analysis are summarized in Table 2-1.

Soil cuttings generated during the well installations were placed in a 55-gallon steel drum. A composite soil sample was collected from the drum and analyzed for TCLP (SW-846 1311)

organic and metals, reactivity, and corrosivity. The soil was transported for disposal by a licensed Florida waste hauler.

2.3 WELL CONSTRUCTION

During the soil vapor assessment, temporary groundwater monitoring points TW01, TW02, and TW03, were installed in the hand augured soil borings for SB03, SB04, and SB10, respectively. These boring locations were selected for monitoring point installations based on the elevated hydrocarbon vapor readings in soil samples collected at the water table during the soil vapor survey. A groundwater sample was obtained from each of the temporary monitoring points using a disposable Teflon bailer. The sample was screened on-site for benzene, toluene, ethylbenzene, and xylenes, utilizing an HNU Systems Model 311D GC portable gas chromatograph (GC). Results of the GC screening were used to evaluate the optimum placement for a permanent monitoring well(s). Each temporary groundwater monitoring point was constructed of 2-inch ID threaded schedule 40 PVC solid riser and 0.010-inch slots with a silt trap and well bottom cap. Each monitor point was completed with 2 feet of well screen. The monitoring point was inserted into the boring annulus and hand-pushed into the top of the water table. Upon collection of the groundwater sample, the monitor point was pulled from the boring and a one foot plug of bentonite pellets was placed at the bottom of the boring and hydrated. The remainder of the boring was then backfilled with the soil cuttings. Each monitor point was delivered to the site factory wrapped in plastic. Prior to installing the monitor points, the casings and well screens were decontaminated as follows:

- Laboratory grade detergent and potable water wash
- Potable water rinse
- Isopropanol rinse
- Deionized water rinse
- Air dry

Groundwater Protection, Inc. under the supervision of a B&R Environmental geologist, installed permanent monitoring well PCY-323-MW01 on June 14, 1996. The well was installed in conjunction with the soil boring procedures discussed above in Section 2.2.2. The well was screened to intersect the water table and was located adjacent to the former oil/water separator location. Analysis of groundwater samples collected from the well would be used to evaluate water quality in the area of the former oil/water separator.

The boring for monitor well PCY-323-MW01 was drilled using a Diedrick D 120C Model drill rig. The boring was advanced using 4 1/4-inch (ID) hollow stem augers. The well was constructed of 2-inch ID threaded schedule 40 PVC solid riser and 0.010-inch slots with silt trap and well bottom cap. The well was completed at approximately 15 feet below land surface. The boring annulus was filled to approximately 1 foot above the well screen with 20/30 silica sand. A one foot layer of bentonite pellets was placed above the sand pack and hydrated. The remainder of the well annulus was grouted to within 3 inches of the top of well casing The well is secured with a locking, water-tight cap within a steel 8-inch diameter steel manhole. The manhole was set within a 24-inch square concrete apron finished slightly above grade. The top of the well is secured with a locking water-tight cap. Well completion logs are provided in Appendix G.

The well was developed using a centrifugal pump. During well development, field measurements of pH, temperature, and specific conductance were monitored from purge water generated during well development. The well was developed until water quality stabilization was determined using the following criteria: temperature +/-05°C, pH +/-0.1 unit, and specific conductivity +/-10 umhos/cm. The well was developed under the supervision of a geologist. All development water was removed for proper disposal by a Florida licensed waste hauler.

2.4 LITHOLOGIC SAMPLING

Representative soil samples were collected to assess the shallow subsurface geologic conditions at the site. Samples used for lithologic description were collected from a stainless steel hand auger or split spoon sampler during the soil boring and monitoring well installations. Soil boring logs are included as Appendix E.

2.5 SOIL VAPOR ANALYSIS

Headspace analysis was conducted on each soil sample using an Organic Vapor Analyzer-Flame Ionization Detector (OVA-FID). The soil vapor analysis was performed according to the headspace method prescribed in Rule 62-770.200 (2) FAC. Screened soil samples with corrected headspace levels in excess of 50 ppm are defined as "excessively contaminated" soil at diesel and used oil contaminated sites. The Headspace Methodology for Determining Soil Organic Vapor Concentrations is described in detail in Appendix F.

2.6 SOIL SAMPLE ANALYSIS

A soil sample was collected to determine the presence or absence of petroleum hydrocarbons or waste oil constituents in the area of the former oil/water separator. The soil sample was collected by B&R Environmental from boring location SB14 on July 12, 1996. Boring SB14 was installed adjacent to SB13, in the area where the highest hydrocarbon vapor concentrations were detected during the soil vapor survey conducted by B&R Environmental. Soils collected from SB13 registered a soil hydrocarbon vapor in reading of 368 ppm. Soil vapor screening data collected during tank removal activities also identified the highest soil vapor concentrations in soils near the north end of the former oil/water separator location.

A composite soil sample was collected using a stainless steel hand augur. The sample was collected from 6 to 8 feet bls at location SB14. Prior to collecting the sample, the hand-auger was cleaned as follows:

- Laboratory grade detergent and potable water wash
- Potable water rinse
- Isopropanol rinse
- Deionized water rinse
- Air dry

The soil sample collected from SB14 was analyzed using SW-846 Method 8260 for GC/MS Volatile Organics, SW-846 Method 8270A for GC/MS Semivolatile Organics, Analytical Methods S3550/9071/418.1 for Total Petroleum Hydrocarbons and ICP Serial Dilution for TCLP Metals and Total Metals. The soil sample was placed on ice and shipped to Quality Analytical Laboratories, Inc., Montgomery, Alabama.

The soil sample was collected in accordance with the FDEP approved comprehensive quality assurance (QA) plan. During the sampling events, quality control samples (i.e. equipment blanks) were prepared and submitted to the laboratory as required by the approved QA procedures. Sampling activities were documented in a site specific field logbook, and samples were transmitted under chain-of-custody protocols.

2.7 HYDROLOGIC INVESTIGATION

The depth to water in monitoring well PCY-323-MW01 was measured on June 15, 1996 and July 12, 1996. Measurements were collected from the top of well casings using an electronic water level indicator. The water level measurements were collected to document the depth to water to the surficial aquifer. The water level measurement field forms are provided in Appendix H. The hydraulic gradient and a tidal influence study was not conducted based on the groundwater analytical results (Section 3.3) from groundwater samples collected at the site.

2.8 WATER SAMPLING

2.8.1 Free Product Sampling

Prior to groundwater sampling on July 12, 1996, B&R Environmental personnel checked each well for free product using a pre-cleaned Teflon bailer. The Teflon bailer was used to extract a water sample from the top of the well's water column to visually inspect for free product. Free product was not encountered during the CA by B&R Environmental personnel.

2.8.2 Groundwater Sampling

Groundwater sampling was performed to determine the presence or absence of dissolved petroleum hydrocarbons or used oil constituents in shallow groundwater in the vicinity of the former oil/water separator. Groundwater samples were collected by B&R Environmental personnel from well PCY-323-MW01 on July 12, 1996. Groundwater samples collected from PCY-323-MW01 were analyzed by ICP Series for lead, arsenic, cadmium, and chromium (all metal analysis were unfiltered), EPA Method 504.1 for GC Extractable Volatile Organic (1-2-dibromoethane EDB), EPA Method 601 for GC Purgeable Halocarbons, and EPA Method 602 for GC Purgeable Aromatics (benzene, toluene, ethylbenzene, and methyl-tert butyl either), EPA Method 610 for GC PAHs, SW-846 Method 8260 for GC/MS Volatile Organics, SW-8468 Method 8270A for GC/MS Semivolatile Organics and EPA Method 418.1 for Total Petroleum Hydrocarbons. The lead, arsenic, and chromium samples were collected using new silicon tubing and a peristaltic pump. The remainder of the groundwater parameters analyzed during the sampling event were collected using pre-cleaned Teflon® bailers. Approximately five well volumes of groundwater were removed from each well using a pre-cleaned Teflon® bailer. Temperature, pH, conductivity measurements and well purge volumes were recorded at the time of sample collection and are provided in Appendix H Groundwater samples were placed on ice and shipped to Quality Analytical Laboratories, Inc., Montgomery, Alabama.

Groundwater samples were collected in accordance with the FDEP approved comprehensive quality assurance (QA) plan. During the sampling events, quality control samples (i.e. equipment blanks) were prepared and submitted to the laboratory as required by the approved QA procedures. Sampling activities were documented in a site specific field logbook, and samples were transmitted under chain-of-custody protocols.

3.0 RESULTS OF INVESTIGATION

3.1 SITE HYDROGEOLOGY

3.1.1 Lithology

The site is underlain by predominantly light brown to dark gray fine to medium grained quartz sand to a depth of approximately 9 feet bls. Due to the homogeneity of the subsurface, no lithologic cross-section was constructed. Soil boring logs are included as Appendix E.

3.1.2 Depth to Groundwater

The site is underlain by the surficial aquifer which is classified as a G-II aquifer by the State of Florida. Based on water level data collected on June 15 and July 12, 1996, the depth to the shallow aquifer at the site is approximately 6 feet bls. The depth to groundwater measurements are presented in Table 3-1. The water level measurement field forms are provided in Appendix H.

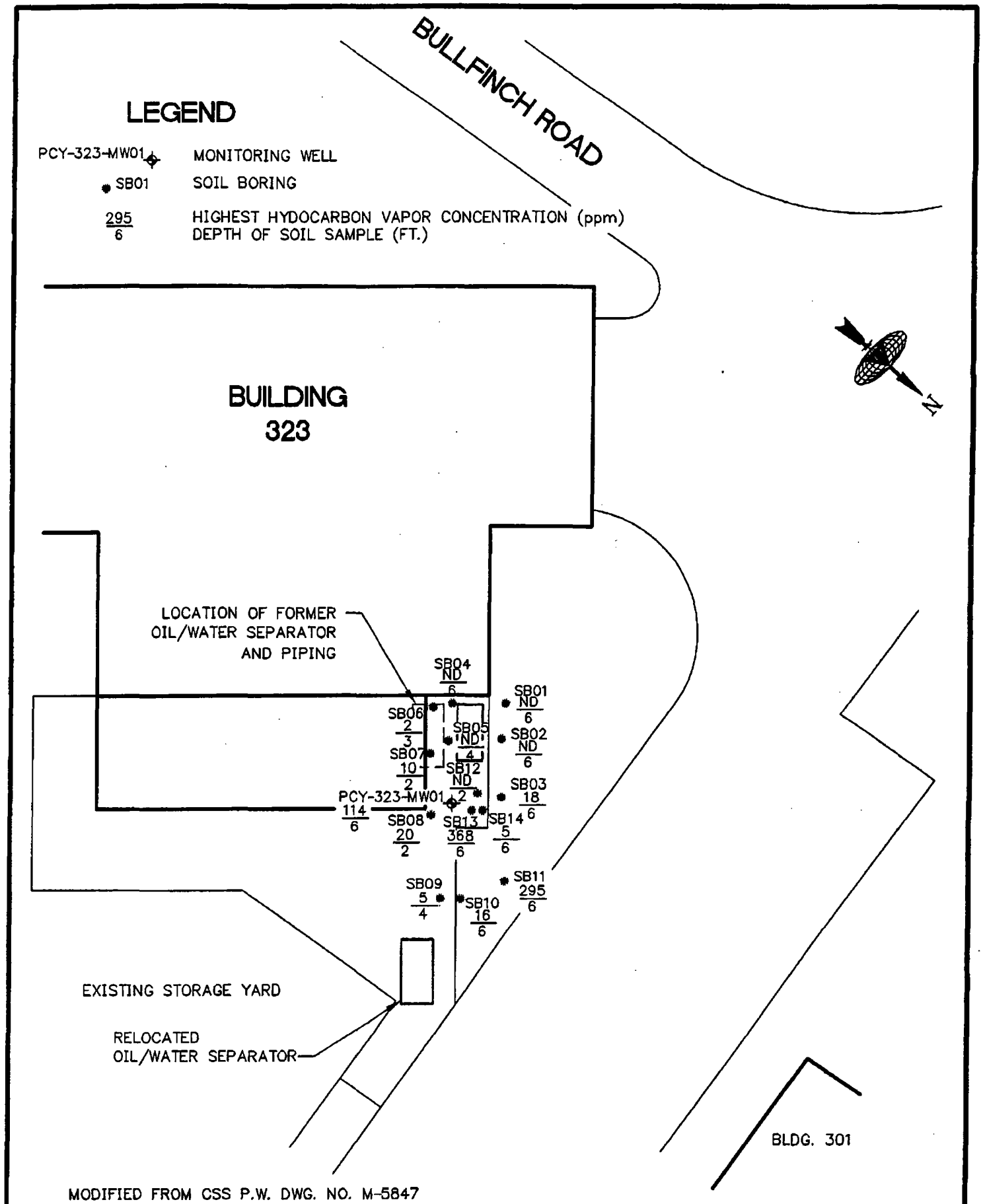
3.2 SOIL QUALITY

The highest soil hydrocarbon vapor concentrations detected from the soil vapor survey was 295 ppm and 368 ppm at boring locations SB11 and SB13, respectively. The soil samples with the highest vapor concentrations were collected at a depth of 6 feet bls at the water table interface. Borings SB11 and SB13 are located north of the area where the former oil/water separator was located. No "excessively contaminated" soil was detected in vadose zone soil samples collected above the water table interface. The highest vadose zone vapor readings were detected in soils from borings SB07 and SB08 at concentrations of 10 ppm and 20 ppm, respectively. A fuel like odor was detected in the soil sample at SB07. Oily stained soil was identified in a soil sample collected at a depth of 2 feet bls at SB06. Soil borings SB06, SB07, and SB08 could only be advanced to 3 feet bls where auger refusal was encountered due the concrete footers for the building. A fuel like odor was identified in soil samples collected at the water table interface at borings SB03, SB04, SB10, SB11, SB13, and monitoring well boring PCY-323-MW01. Soil vapor screening results are presented in Table 2-1. Soil boring locations and vapor readings are depicted on Figure 3-1.

TABLE 3-1
DEPTH TO GROUNDWATER MEASUREMENTS
Site 323
Coastal Systems Station, Panama City, Florida
FDEP Facility No. 038518667

Well Number	Date	Free Product Thickness (feet)	Depth to Water (feet)	Well Screen Interval (feet below land surface)
PCY-323-MW01	06/15/96	0.00	6.62	5 to 15
	07/12/96	0.00	6.30	

Notes:
All water levels are measured below top of casing.



MODIFIED FROM CSS P.W. DWG. NO. M-5847

SITE MANAGER: GFG	CHECKED BY: –
DRAWN BY: TCB	DRAWING DATE: 5/22/96
SURVEYED BY:	SURVEY DATE:
SCALE: 1"=20'	
CAD DWG. NO.: 7113ESIT	PROJ. NO.: 7113

Brown & Root Environmental

FIGURE 3-1

SOIL HYDROCARBON VAPOR CONCENTRATIONS – SITE 323

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

B&R Environmental collected a composite soil sample from boring SB14 on July 12, 1996 for laboratory analysis. The soil sample was collected at the water table at a sample interval of 6 to 8 feet bls. Analysis from the composite sample adjacent to the former oil/water separator location. reported volatile and semi volatile organic compounds below laboratory detection limits. RCRA metal concentrations of arsenic, barium, chromium, and lead were reported at 0.48, 2.2, 2.1 and 3.7 micrograms per kilogram (mg/kg), respectively. All reported RCRA metal concentrations were at concentrations below FDEP Soil Clean-up Goals FDEP (John M. Ruddell, FDEP Memorandum, September 29, 1995), TCLP metal analysis reported concentrations of arsenic, barium, cadmium, chromium, lead, and silver at 20.9, 500, 3.4, 5.7, 30.2, and 2.8 ug/L, respectively. TRPH was detected in the soil at 22 mg/kg The reported concentrations for the TCLP metals and the TRPH compounds were reported at concentrations which meet criteria for clean soil as established in Chapter 17-775.400. The laboratory data sheets for the soil analysis are provided in Appendix I.

3.3 WATER QUALITY

Results of field screening groundwater samples with a portable GC identified dissolved hydrocarbons at TW01 (SB03) and TW02 (SB04). The groundwater sample from TW01 reported toluene, ethylbenzene, and xylenes at concentrations of 0.588, 14.589, and 37.187 parts per billion (ppb), respectively. Groundwater in well TW02 contained benzene and toluene at concentrations of 12.034 and 2.081 ppb, respectively. Dissolved hydrocarbons were not detected in the groundwater sample collected form TW03 (SB10). Based on the field screening water quality results, the permanent monitoring well, PCY-323-MW01 was located between temporary well points TW01 and TW02 near the northeast end of the former oil/water separator. The field GC groundwater quality reports are provided in Appendix J.

B&R Environmental collected a groundwater sample from monitor well PCY-323-MW01 on July 12, 1996. Laboratory analysis of the groundwater sample for all parameters analyzed under EPA Methods 601, 602, 610, and 504.1, SW-846 Method 8260, and SW-846 Method 8280A were reported below laboratory detection limits. A Total VOA concentration of 7.6 microgram per liter (ug/L) was report in the groundwater sample. Benzene was reported below laboratory detection limits. The concentration of Total VOA is well below the State Action Level of 50 ug/L. Total lead was reported at 3.5 ug/L which is below the State Target Level of 50 ug/L. Arsenic and chromium were detected in the groundwater at 3.1 and 3.2 ug/L. These concentrations are below the Florida Primary Drinking Water Standards for arsenic and chromium. TRPH was detected at 1.67 milligrams per liter (mg/L) which is below the State Action Level of 5 mg/L.

Trace amounts of lead, arsenic, chromium, and toluene were reported in the equipment blank. The detection of these constituents are at levels which do not effect the interpretation of the data and the water quality data is considered acceptable. A summary of groundwater analytical results are presented in Table 3-2. Groundwater laboratory analytical results are provided as Appendix K. Field sampling forms are included in Appendix H.

TABLE 3-2
SUMMARY OF GROUNDWATER QUALITY:
SELECTED PARAMETERS FROM THE GASOLINE AND KEROSENE ANALYTICAL GROUP
Site 323
Coastal Systems Station, Panama City, Florida
FDEP ID No. 038518667

Well ID	Date Sampled	Benzene (µg/L)	Total VOA (µg/L)	MTBE (µg/L)	DCE (µg/L)	EDB (µg/L)	NAP (µg/L)	Total NAPS (µg/L)	TRPH (mg/L)	Volatile Organics (µg/L)	Semi Volatile Organics (µg/L)	Arsenic Unfiltered Samples (µg/L)	Cadmium Unfiltered Samples (µg/L)	Chromium Unfiltered Samples (µg/L)	Lead Unfiltered Samples (µg/L)
PCY-323-MW01	07/12/96	<1.0	7.6	< 1.0	<1.0	<0.02	<4	NCD	1.67	NCD	NCD	3.1	<3.3	3.2	3.5
Trip Blank	07/12/96	<1.0	1.7	<1.0	<1.0	NA	NA	NA	NA	NCD	NA	NA	NA	NA.	NA
Equipment Blank	07/12/96	< 1.0	1.3	< 1.0	<1.0	<0.02	NA	NA	<0.05	NCD	NCD	1.2	<3.3	2.6	2.4

NA = not analyzed
Total VOA = total volatile organic aromatics = sum of benzene, toluene, ethylbenzene, and xylenes
MTBE = methyl tert-butyl ether
DCE = 1,2-Dichloroethane
EDB = 1,2-Dibromoethane = ethylene dibromide
NCD = no constituents detected
TRPH = total petroluem hydrocarbons
NAP = naphthalene
Total NAPS = sum of total naphthalene constituents detected in sample

Notes:
An equipment blank analysis was not performed for GC Polynuclear Aromatic Hydrocarbons due to a crack in the equipment blank sample bottle received during sample shipment.

4.0 DISCUSSION

In March 1994, approximately 16 cubic yards of "excessively contaminated soil, as defined by Chapter 62-770 FAC, was removed from an excavation which contain an oil/water separator near Building 323. Since removal of the separator, a building addition has been added onto Building 323. Part of the building addition now covers the southeast end of the area where the former oil/water separator was previously located. During June 1996, B&R Environmental conducted a soil vapor survey in the area of the former oil/water separator. "Excessively contaminated" soil was not encountered within the vadose zone soils during the assessment. The removal of excessively contaminated soil from the vadose zone appears to have been completed during removal of soils in March 1994. An oily stained soil was observed in a soil sample collected adjacent to the building. The location of the building's addition has restricted access for subsurface borings to the southeast of where the former oil/water separator was located.

The highest concentration of hydrocarbon vapors were detected in soils at the water table interface located at approximately 6 feet bls. A composite soil sample collected from 6 to 8 feet bls, show all constituents analyzed for the Gasoline and Kerosene Analytical Groups, including used oil constituents, meet criteria for clean soil as established in Chapter 17-775.400 FAC, and the FDEP Soil Clean-up Goals. Free product was not encountered during the CA.

Laboratory analysis of groundwater samples collected near the former oil/water separator location report low levels of Total VOAs and TRPH in the groundwater. Trace amounts of lead, arsenic, and chromium were also detected in the groundwater.

The oil/water separator operated via gravity flow and contained no safety shut off devices. The source of the soil contamination is likely from overflows which may have occurred at the oil/water separator as documented from soil vapor data collected during removal of the tank.

Depth to water to the surficial aquifer (water table) has been documented at approximately 6 feet bls. The total dissolved solids content in the surficial aquifer in the area of CSS, qualifies the aquifer for classification as a G-II aquifer (Chapter 62-3.403 FAC).

Well fields and surface water intakes which supply drinking water to the local area are located outside a 0.50-mile radius of the site. Domestic water wells were not identified within 0.25-mile of the site. Surface water bodies and freshwater aquifers utilized in the study area are not likely to be threatened by the levels of hydrocarbons detected at the site.

5.0 CONCLUSIONS AND RECOMMENDATION

The results of B&R Environmentals's CA at CSS Building 323 suggest the following:

- Groundwater in the surficial aquifer at the site has a G-II classification;
- Private potable water wells were not identified within 0.25-mile radius of the site;
- Municipal well fields and surface water intakes were not identified within a 0.50-mile radius of the site;
- Excessively contaminated soil was not encountered during the CA;
- Laboratory results of a composite soil sample collected near the former oil/water separator report all compounds and analytes at levels which meet the FDEP clean soil criteria;
- Free product was not encountered at the site; and
- Total VOAs, TRPH, lead, arsenic, and chromium were detected in a groundwater sample collected from a monitor well installed near the former location of the oil/water separator. The Total VOA concentration was 7.6 ug/L which is below the State Action Level of 50 ug/L. TRPH was detected at 1.67 milligrams per liter (mg/L) which is below the State Action Level of 5 mg/L. Total lead was reported at 3.5 ug/L which is below the State Target Level of 50 ug/L. Arsenic and chromium were detected in the groundwater at 3.1 and 3.2 ug/L. These concentrations are below the Florida Primary Drinking Water Standards for arsenic and chromium. All other dissolved petroleum constituents analyzed in groundwater samples collected at the site were reported below laboratory detection limits and do not exceed FDEP No Further Action (NFA) criteria for a G-II aquifer, without wells (FDEP, 1990) (Table 5-1);

Based upon the hydrogeological and chemical data presented in this CAR, and the CA criteria for No Further Action (NFA) status as described in Rule 62-770.600(5) FAC and the FDEP Publication FDER-10/90, B&R Environmental proposes a **NFA** status for the site.

TABLE 5-1
MAXIMUM ACCEPTABLE GROUNDWATER CONSTITUENT LEVELS
Site 323
Coastal Systems Station, Panama City, Florida
FDEP Facility No. 038518667

Analyte or Analytical Method	Highest Ground Water Constituent Level in Site Monitoring Wells	No Further Action		Monitoring Only			
		G-II Aquifer (with wells)	G-II Aquifer (without wells)	G-II Aquifer with wells		G-II Aquifer without wells	
				source	perimeter	source	perimeter
Total BTEX	7.6	50	50	500	50	1000	50
Benzene	<1.0	1	50	250	1	500	50
TRPH	1.67^	5^	5^	50^	5^	100^	5^
Lead	3.5	50	50	500	50	1^	50
EDB	<0.02	0.02	0.02	0.02	0.02	0.4	0.02
Total Naphs	NCD	100	100	1000	100	2000	100
EPA 610	<4	DL	DL	10xDL	DL	20xDL	DL
EPA 601	<1.0	DW-SRLs	DW-SRLs	10xDW-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs
Arsenic	3.3	50	50	500	50	1^	50
Cadmium	<3.3	10	10	100	10	200	10
Chromium	3.2	50	50	500	50	1^	50
EPA 624	NCD	DW-SRLs	DW-SRLs	10xDL-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs
EPA 625	NCD	DW-SRLs	DW-SRLs	10xDL-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs

Notes:
All data in µg/L unless otherwise noted
^ data in mg/L

Source: Monitoring wells near suspected hydrocarbon source
Perimeter: Monitoring wells located at perimeter of plume
TRPH: Total Recoverable Petroleum Hydrocarbons
Total Naphs: Sum of naphthalenes and methylnaphthalenes
DW-SRLs: Drinking Water Standards or Applicable Site Rehabilitation Levels
DL: Detection Limit
NCD No Constituents Detected

6.0 REFERENCES

ABB Environmental Services, Inc., 1995, RCRA Facility Investigation , Coastal Systems Station Panama City, Florida.

Clayton, Michael, February 2, 1996, personal communication, Environmental Engineer, Coastal Systems Station

E.C. Jordan Company, 1990, Release Detection Program For Underground Storage Tanks, Naval Coastal Systems Center Panama City, Florida.

Florida Department of Environmental Protection, October 1990. *No Further Action and Monitoring Only Guidelines for Petroleum Contaminated Sites*. Guidance document issued by Bureau of Waste Cleanup, Technical Review Section.

NAVFAC Drawing No. 523940, August 17, 1993.

NAVFAC Drawing No. 5239421, Record Drawing November 9, 1995.

Ruddel, M. John, Division of Waste Management, Florida Department of Environmental Protection, Memorandum to District Directors, Waste Management Administrators, Subject: Soil Cleanup Goals for Florida, September 29, 1995.

U.S. Geological Survey. Panama City, FLA., Quadrangle 1982. 7.5 minute series, Topographic Quadrangle Maps of Florida: scale 1:24,000.

U.S. Geological Survey. Panama City Beach, FLA., Quadrangle 1982. 7.5 minute series, Topographic Quadrangle Maps of Florida: scale 1:24,000.

APPENDIX A

DISCHARGE NOTIFICATION FORM

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Discharge Reporting Form

Use this form to notify the Department of Environmental Regulation of:

1. Results of tank tightness testing that exceed allowable tolerances within ten days of receipt of test result.
2. Petroleum discharges exceeding 25 gallons on pervious surfaces as described in Section 17-761.460 F.A.C. within one working day of discov
3. Hazardous substance (CERCLA regulated), discharges exceeding applicable reportable quantities established in 17-761.460(2) F.A.C., wi one working day of the discovery.
4. Within one working day of discovery of suspected releases confirmed by: (a) released regulated substances or pollutants discovere the surrounding area, (b) unusual and unexplained storage system operating conditions, (c) monitoring results from a leak detection met or from a tank closure assessment that indicate a release may have occurred, or (d) manual tank gauging results for tanks of 550 gall or less, exceeding ten gallons per weekly test or five gallons averaged over four consecutive weekly tests.

Mail to the DER District Office in your area listed on the reverse side of this form

PLEASE PRINT OR TYPE

Complete all applicable blanks

1. DER Facility ID Number: 038518667 2. Tank Number: 323(Unregulated) 3. Date: 2/16/94
4. Facility Name: Coastal Systems Station

   Facility Owner or Operator: U. S. Navy

   Facility Address: 6703 W. Highway 98, Panama City, FL 32407-7001

   Telephone Number: (904) 234-4743 County: Bay

   Mailing Address: Commanding Officer, Code 3610AM, 6703 W. HWY 98, Panama City, FL . 32407-70
5. Date of receipt of test results or discovery: 16 February 1994 month/day/
6. Method of initial discovery. (circle one only)
   A. Liquid detector (automatic or manual)
   B. Vapor detector (automatic or manual)
   C. Tightness test (underground tanks only).
   D. Emptying and Inspection.
   E. Inventory control.
   F. Vapor or visible signs of a discharge in the vic
   G. Closure: _____ (exc
   (H) Other: Tank(Oil Water Separator Rer
7. Estimated number of gallons discharged: UNKNOWN
8. What part of storage system has leaked? (circle all that apply) A. Dispenser. B. Pipe C. Fitting D. Tank (E.) Unkr
9. Type of regulated substance discharged. (circle one)
   A. leaded gasoline
   B. unleaded gasoline
   C. gasohol
   D. vehicular diesel
   F. aviation gas
   (G.) jet fuel
   (L) used/waste oil
   (M.) diesel
   Q. new/lube oil
   V. hazardous substance includes pesticides, amm chlorine and derivatives (write in name or Chemical Abs Service CAS number) _____
   Z. other (write in name) _____
10. Cause of leak. (circle all that apply)
    (A.) Unknown
    B. Split
    C. Loose connection
    D. Corrosion
    E. Puncture
    F. Installation failure
    G. Spill _____
    H. Overfill
    I. Other (specify) _____
11. Type of financial responsibility. (circle one)
    A. Third party insurance provided by the state insurance contractor
    B. Self-insurance pursuant to Chapter 17-769.500 F.A.C.
    (C) Not applicable
    D. None
12. To the best of my knowledge and belief all information submitted on this form is true, accurate, and complete.

W. O. WALKER, PUBLIC WORKS OFFICER

Printed Name of Owner, Operator or Authorized Representative

W.O. Walker

Signature of Owner, Operator or Authorized Representa

APPENDIX B

CAR SUMMARY SHEET

Facility Name: Coastal Systems Station

Location: Panama City, Florida

EDI #: _____ FAC I.D. #: 038518667

Reimbursement Site ☐
State Contract Site ☐
Other: ☒

(1) Source of spill: Oil/water Separator Date of spill: Unknown

(2) Type of product:

gasoline group	gasoline lost	kerosene group	gallons lost
☐ leaded		☐ kerosene	
☐ unleaded regular		☒ diesel	unknown
☐ unleaded premium		☒ JP-4 Jet fuel	unknown
☐ gasohol		☐ Jet A fuel	

(3) Description of IRA (if any): Soils excavated from oil/water separator tank pit.

☐ Free product removal: _____ (gals)
☒ Soil removal: 16 (cubic yds)
☒ Soil incineration; hand filled 16 (cubic yds)

(4) Free product still present? (yes/no) Maximum apparent product thickness: Ø (ft)

(5) Maximum groundwater contaminant levels (ppb): Total VOA: 7.6 benzene: BDL EDB: BDL
Lead: 3.5 MTBE: BDL other: TRPH 1.67
Arsenic 3.1 ug
Chromium 3.2

(6) Brief lithologic description: light brown to dark grey fine to medium grained sand.

(7) Areal and vertical extent of soils contamination defined? (yes/no) (where access for auger advancement availab
High current soil concentration (OVA: 2.0 ppm) or (EPA Method 5030/8020: _____ ppb)

(8) Lower aquifer contaminated? (yes/no) Depth of vertical contamination: 15 ft

(9) Date of last complete round of groundwater sampling: 7/12/96. Date of last soil sampling: 7/12/96.

(10) QAPP approved? (yes/no) Date: 6/16/96

(11) Direction (e.g. NNW) of surficial groundwater flow: Not Determined (Figure _____ on page _____)

(12) Average depth of groundwater: 6 (ft)

(13) Observed range of seasonal groundwater fluctuations: not Determined (ft)

(14) Estimated rate of groundwater flow: Not Determined (ft/day)

(15) Hydraulic gradient across site: Not Determined (ft/ft)

(16) Aquifer characteristics:

	Value	Units	Methods
Hydraulic conductivity	–		
Storage coefficient	–		
Aquifer thickness	–		
Effective soil porosity	–		
Transmissivity	–		

(17) Other remarks: Aquifer Characteristics were not determined because No Further Action is recommended.

APPENDIX C

LABORATORY SLUDGE ANALYSIS DATA SHEETS

DIRT DISPOSED AT BAY COUNTY LANDFILL

SAMPLE PROGRESS REPORT

Envirochem, Inc.
Date: 03-02-1994 Time: 16:09:42

Sample I.D. AA21688
Status: In invoice queue
Purchase order number: 7516
Account code: 012
Location code: 012-PC
Sample collector: CLIENT/TC/TB
Sam type: SLUDGE

Date collected: 02/16/94
Date submitted: 02/17/94
Due date: 03/02/94
Specification checking: off
Descript: SES-PC B & K CONST S-1 F94-0

Analysis	Result	Unit	Finished
(16) TCLP - ARSENIC	<0.01	ppm	02/22/94
(16) TCLP - BARIUM	<0.5	ppm	02/22/94
(16) TCLP - CADMIUM	<0.05	ppm	02/22/94
(16) TCLP - CHROMIUM	<0.05	ppm	02/22/94
(16) TCLP - LEAD	<0.05	ppm	02/22/94
(16) TCLP - MERCURY	<0.005	ppm	02/21/94
(16) TCLP - SELENIUM	<0.01	ppm	02/22/94
(16) TCLP - SILVER	<0.05	ppm	02/22/94
(17) TCLP - VOLATILE ORGANICS	Completed	ppb	02/18/94
(17) TCLP - SEMIVOLATILES	Completed	ppb	02/21/94
(17) TCLP - HERBICIDES	Completed	ppm	02/20/94
(17) TCLP - PESTICIDE	Completed	ppm	02/21/94
(17) TCLP ZERO HEADSPACE EXTRACT	Completed		02/19/94
(18) TCLP EXTRACTION PROCEDURE	Completed		02/18/94

Results of multicomponent analysis (17) TCLP - VOLATILE ORGANICS
Original source Manual entry

Analyte Name	Result	MDL
VINYL CHLORIDE	bdl	100
1,1-DICHLOROETHYLENE	bdl	100
CHLOROFORM	bdl	100
CARBON TETRACHLORIDE	bdl	100
TRICHLOROETHYLENE	bdl	100
TETRACHLOROETHYLENE	bdl	100
CHLOROBENZENE	bdl	100
1,4-DICHLOROBENZENE	bdl	100
BENZENE	bdl	100
METHYL ETHYL KETONE	bdl	1000
1,2-DICHLOROETHANE	bdl	100

Results of multicomponent analysis (17) TCLP - SEMIVOLATILES
Original source Manual entry

Analyte Name	Result	MDL
2,4-DINITROTOLUENE	bdl	100
HEXACHLOROBENZENE	bdl	100
HEXACHLOROBUTADIENE	bdl	100
HEXACHLOROETHANE	bdl	100

Sample AA21685 Analysis (17) TCLP - SEMIVOLATILES results (continued):

Analyte Name	Result	MDL
m-CRESOL	bdl	100
o-CRESOL	bdl	100
p-CRESOL	bdl	100
NITROBENZENE	bdl	100
PENTACHLOROPHENOL	bdl	100
PYRIDINE	bdl	100
2,4,5-TRICHLOROPHENOL	bdl	100
2,4,6-TRICHLOROPHENOL	bdl	100

Results of multicomponent analysis (17) TCLP - HERBICIDES
Original source Manual entry

Analyte Name	Result	MDL
2,4-DICHLOROPHENOXY ACETIC ACID	bdl	1.0
SILVEX	bdl	1.0

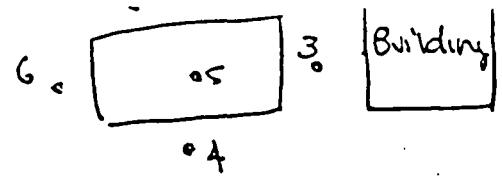
Results of multicomponent analysis (17) TCLP - PESTICIDE
Original source Manual entry

Analyte Name	Result	MDL
HEPTACHLOR	bdl	0.008
HEPTACHLOR EPOXIDE	bdl	0.008
LINDANE	bdl	0.008
METHOXYCHLOR	bdl	0.008
CHLORDANE	bdl	0.02
TOXAPHENE	bdl	0.10
ENDRIN	bdl	0.008

End of progress report on sample: AA21685

APPENDIX D

OIL/WATER SEPARATOR REMOVAL SOIL SAMPLE LOCATIONS AND SOIL VAPOR READINGS



FIELD OVA DATA

SITE Bldg # 323 JOB NO.

DATE 2-16 TECH.

BORING #	DEPTH (FEET)	SOIL CLASSIFICATION	W/O FILTER (PPM)	WITH FILTER (PPM)	CORR. READING (PPM)
B-1	3		24	10	14
	6		120	2.4	117.6
B-2	3		22	Ø	22
	6		130	2.8	127.2
B-3	2		24	Ø	24
	5		15	Ø	15
	7		110	2.4	107.6
B-4	3		13	Ø	13
	6		74	0.8	73.2
B-5	6		150	18.0	132.0
	7		210	46	166
B-6	3		20	Ø	20
	6		130	12	118

Samples Collected Per QA plan # 9200016 procedures following 17-770. FAC Sampling protocal

Southern Earth S

OVA Readings After 16 CY of Soil Removed:

FIELD OVA DATA
(2nd Readings)

SITE Bldg 323 JOB NO. F94-

DATE 3/9/94 TECH. T.C/T.B

BORING #	DEPTH (FEET)	SOIL CLASSIFICATION	W/O FILTER (PPM)	WITH FILTER (PPM)	CORR. READING (PPM)	Comments
B-1	5'	SW	160.0	.6	159.4	Strong
2	5	SE	200.0	20.0	180.0	
3	5	NW	100.0	Ø	100.0	
4	5	NE	240.0	2.0	238.0	
5	5	E	340.0	140.0	200.0	
6	5	W	240.0	0	240.0	
7	7	Bottom	330.0	200.0	130.0	
		Sheen on Bottom Sample				
8	4'	undisturbed West	140	Ø		

Jamie Cole
Southern Earth Sciences Inc
904-769-4773

APPENDIX E

SOIL BORING LOGS

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:	PROJECT: CTO 0008 Site 323		BORING NO. SB01
			TOTAL DEPTH: 9.0'
	JOB NO.	7113	LOGGED BY: G. Helms
	PROJ.MGR:	G. Goode	EDITED BY:
	DRILLING CONTRACTOR:	NA	
	DRILL RIG TYPE:	NA	
	DRILLER'S NAME	NA	
See Soil Boring Location Map	SAMPLING METHODS:	Hand auger	
	STARTED TIME:	1430	DATE: 6/14/96
	COMPLETED TIME:	1458	DATE: 6/14/96
	BORING DEPTH (ft.)	9.0'	
	CASING DEPTH (ft.)	NA	
	WATER DEPTH (ft.)	—	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored 6 inches of concrete prior to drilling.
2	HA	–	–	–	moist	–	5	5	0	2		SAND, lt. tan, fg-mg qtz., well graded, trace silt, moist
3										3	SW	
4	HA	–	–	–	moist	–	0	0	0	4		SAND, lt. tan, fg-mg qtz., well graded, some silt, moist
5										5	SW	
6	HA	–	–	–	moist	–	0	0	0	6		
7										7	SW	SAND, light gray, fg-mg qtz., well graded, moist. Wet @ 7.5'.
8	HA	–	–	–	WET	–	0	0	0	8		
9										9	SW	SAND, lt. tan, fg-med grained qtz., well graded, wet.

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:	PROJECT:	CTO 0008 site 323	BORING NO. SB02
			TOTAL DEPTH: 9.0'
	JOB NO.	7113	LOGGED BY: G. Helms
	PROJ.MGR:	G. Goode	EDITED BY:
See Soil Boring Location Map	DRILLING CONTRACTOR:	NA	
	DRILL RIG TYPE:	NA	
	DRILLER'S NAME	NA	
	SAMPLING METHODS:	Hand auger	
	STARTED TIME:	1500	DATE: 6/14/96
	COMPLETED TIME:	1512	DATE: 6/14/96
	BORING DEPTH (ft.)	9.0'	
	CASING DEPTH (ft.)	NA	
	WATER DEPTH (ft.)	—	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through six inches of concrete prior to handaugering.
2	HA	–	–	–	moist	–	0	0	0	2		SAND, brown, fg-mg qtz., well graded, moist
3										3	SW	
4	HA	–	–	–	moist	–	0	0	0	4		SAND, light tan, fg-mg qtz., trace silt, well graded, moist.
5										5	SW	
6	HA	–	–	–	moist	–	0	0	0	6		SAND, light tan, fg-mg qtz., some silt, some organics, well graded, moist.
7										7	SW	
8	HA	–	–	–	WET	–	15	0	15	8		Wet @ 7.5" SAND, tan, fg-mg qtz., some silt, well graded, wet.
9										9	SW	

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

SB03

LOCATION OF BORING:	PROJECT: CTO 0098		BORING NO. TW01
			TOTAL DEPTH: 9.0'
	JOB NO.	7113	LOGGED BY: G. Helms
	PROJ.MGR:	G. Goode	EDITED BY:
See Soil Boring Location Map.	DRILLING CONTRACTOR:	NA	
	DRILL RIG TYPE:	NA	
	DRILLER'S NAME	NA	
	SAMPLING METHODS:	Hand Auger	
	STARTED TIME:	1625	DATE: 6/14/96
	COMPLETED TIME:	1645	DATE: 6/14/96
	BORING DEPTH (ft.)	9.0'	
	CASING DEPTH (ft.)	NA	
	WATER DEPTH (ft.)	—	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through 6 inches of concrete prior to hand augering.
2	HA	—	—	—	moist	—	1	0	1	2		SAND, gray, fg-mg, predominantly qtz., some silt, well graded, moist.
3										3	SW	
4	HA	—	—	—	moist	—	0	0	0	4		SAND, gray, fg-mg, predominantly qtz., some silt, well graded, moist.
5										5	SW	
6	HA	—	—	—	moist	—	23	5	18	6		SAND, dk gray, fg-mg, predominantly qtz., some silt, well graded, moist (wet at bottom of sample ~ 7.0')
7										7	SW	
8	HA	—	—	—	wet	—	700	220	480	8		silty SAND, fg-mg qtz., well graded, wet, strong fuel-like odor.
9										9	SM	

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

* permit # T9601502 (previously SB03)

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

SB04

LOCATION OF BORING: See Soil Boring Location Map	PROJECT: CT00008 Site 323		BORING NO. TW02
			TOTAL DEPTH: 9.0'
	JOB NO.	7113	LOGGED BY: G. Helms
	PROJ.MGR:	G. Goode	EDITED BY:
	DRILLING CONTRACTOR:	NA	
	DRILL RIG TYPE:	NA	
	DRILLER'S NAME	NA	
	SAMPLING METHODS:	Hand Auger	
	STARTED TIME:	1512	DATE: 6/14/96
	COMPLETED TIME:	1520	DATE: 6/14/96
	BORING DEPTH (ft.)	9.0'	
	CASING DEPTH (ft.)	NA	
	WATER DEPTH (ft.)	—	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through 6 inches of concrete prior to hand auger
2	HA	–	–	–	moist	–	0	ND	0	2		
3										3	SW	SAND, lt. gray w/ some darker grains, fg-mg qtz, darker grains are silt, well graded, moist
4	HA	–	–	–	moist	–	0	ND	0	4		SAND, lt. tan, fg-mg qtz, trace silt, well graded, moist.
5										5	SW	
6	HA	–	–	–	moist	–	0	ND	0	6		SAND, gray, fg-mg qtz, some silt, well graded, moist, slt. fuel like odor.
7										7	SW	
8	HA	–	–	–	WET	–	1000	7	993	8		Wet @ 7.5'. SAND, brownish gray, fg-mg qtz, some silt, well graded, wet, fuel like odor.
9										9	SW	

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

* Permit # T9601503 (previously SB04)

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:	PROJECT: CTO 0008 Site 323	BORING NO. SB05
		TOTAL DEPTH: 5.0'
	JOB NO. 7113	LOGGED BY: G. Helms
	PROJ.MGR: G. Goode	EDITED BY:
See Soil Boring Location Map	DRILLING CONTRACTOR: NA	
	DRILL RIG TYPE: NA	
	DRILLER'S NAME NA	
	SAMPLING METHODS: Hand auger	
	STARTED TIME: 0735	DATE: 6/15/96
	COMPLETED TIME: 0748	DATE: 6/15/96
	BORING DEPTH (ft.) 5.0'	
	CASING DEPTH (ft.) —	
	WATER DEPTH (ft.) —	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through 6 inches of Concrete prior to hand augering.
2	HA	—	—	—	moist	—	0	0	0	2		SAND, brownish gray, fg-mg qtz;
3										3	X SW X	trace silt, well graded, moist.
4	HA	—	—	—	moist	—	0	0	0	4		SAND, brownish gray, fg-mg, qtz,
5										5	X SW X	trace silt, well graded, moist
6										6		* Auger refusal at ~5.0' bls.
7										7		
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:	PROJECT: CTO 0008 Site # 323	BORING NO. SB06
		TOTAL DEPTH: 2.5'
	JOB NO. 7113	LOGGED BY: G. Helms
	PROJ.MGR: G. Goode	EDITED BY:
	DRILLING CONTRACTOR: NA	
see soil boring location map	DRILL RIG TYPE: NA	
	DRILLER'S NAME NA	
	SAMPLING METHODS: Hand Auger	
	STARTED TIME: 1523	DATE: 6/14/96
	COMPLETED TIME: 1552	DATE: 6/14/96
	BORING DEPTH (ft.) 2.5'	
	CASING DEPTH (ft.) NA	
	WATER DEPTH (ft.) —	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through 6 inches of concrete prior to hand augering
2	HA	–	–	–	moist	–	3	0	3	2 X	SW	SAND, dk brown, fg-mg qtz., well graded, moist, stained, oily, odor is sweet.
3										ECF X 3		
4										4		* re-calibrated instrument; same readings.
5										5		Hit debris (bricks) at 2.5'.
6										6		
7										7		
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING: see Soil Boring Location Map	PROJECT: CTO 0028 Site 323		BORING NO. SB07
			TOTAL DEPTH: 3.0'
	JOB NO.	7113	LOGGED BY: G. Helms
	PROJ.MGR:	G. Goode	EDITED BY:
	DRILLING CONTRACTOR:	NA	
	DRILL RIG TYPE:	NA	
	DRILLER'S NAME	NA	
	SAMPLING METHODS:	Hand auger	
	STARTED TIME:	1557	DATE: 6/14/96
	COMPLETED TIME:	1605	DATE: 6/14/96
	BORING DEPTH (ft.)	3.0'	
	CASING DEPTH (ft.)	NA	
	WATER DEPTH (ft.)	—	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	
1										1		Cored through six inches of concrete prior to handauguring
2	HA	—	—	—	moist	—	11	1	10	2		SAND, dk brown, fg-mg qtz., Well graded, moist, odor is sweet + fuel like. Encountered debris from 2.5' to 3.0'. Refusal at 3.0'.
3										3	X SW X	
4										4		
5										5		
6										6		
7										7		
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:

See Soil Boring Location Map

PROJECT: CTO 0008 Site 323		BORING NO. SB08
		TOTAL DEPTH: 3'
JOB NO.	7113	LOGGED BY: G. Goode
PROJ.MGR:	G. Goode	EDITED BY: G. Goode
DRILLING CONTRACTOR:	NA	
DRILL RIG TYPE:	NA	
DRILLER'S NAME	NA	
SAMPLING METHODS:	Hand Auger	
STARTED TIME:	16:07	DATE: 6/14/96
COMPLETED TIME:	16:15	DATE: 6/14/96
BORING DEPTH (ft.)	3'	
CASING DEPTH (ft.)	NA	
WATER DEPTH (ft.)	—	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		
2	HA	—	—	—	moist	—	20	ND	20	2	SP	Sand, light brown, fine to medium grained, (Some black stained) petroleum like odor, loose, moist, — Auger Refusal at 3' bls
3										3		
4										4		
5										5		
6										6		
7										7		
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:	PROJECT: CTO 0008 Site 323	BORING NO. SB09
		TOTAL DEPTH: 6'
	JOB NO. 7113	LOGGED BY: G. Goode
	PROJ.MGR: G. Goode	EDITED BY: G. Goode
	DRILLING CONTRACTOR: NA	
See Soil Boring Location Map	DRILL RIG TYPE: NA	
	DRILLER'S NAME NA	
	SAMPLING METHODS: Hand Auger	
	STARTED TIME: 16:45	DATE: 6/14/96
	COMPLETED TIME: 17:35	DATE: 6/14/96
	BORING DEPTH (ft.) 6'	
	CASING DEPTH (ft.) NA	
	WATER DEPTH (ft.) —	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		
2	HA	—	—	—	moist	—	ND	NS	ND	2	SP	Sand, dark gray, fine to medium grained quartz, loose, moist
3										3		
4	HA	—	—	—	moist	—	8	3	5	4	SP	Sand, dark gray, fine to medium grained quartz, loose, moist
5										5		
6										6		Auger Refusal at 6'
7										7		
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

TW03

LOCATION OF BORING: See Soil Boring Location Map	PROJECT: CTO-0008 Site 323		BORING NO. SB10
			TOTAL DEPTH: 9.0'
	JOB NO.	7113	LOGGED BY: G. Helms
	PROJ.MGR:	G. Goode	EDITED BY:
	DRILLING CONTRACTOR:	NA	
	DRILL RIG TYPE:	NA	
	DRILLER'S NAME	NA	
	SAMPLING METHODS:	Hand auger	
	STARTED TIME:	1845	DATE: 6/14/96
	COMPLETED TIME:	1911	DATE: 6/14/96
	BORING DEPTH (ft.)	9.0'	
	CASING DEPTH (ft.)	NA	
	WATER DEPTH (ft.)	—	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		
2	HA	—	—	—	moist	—	25	10	15	2		SAND, dk gray, mg-fg, qtz,
3										3	SW	some silt, well graded moist.
4	HA	—	—	—	moist	—	13	8	5	4		SAND, dk gray, fg-mg qtz, some
5										5	SW	silt, well graded moist.
6	HA	—	—	—	moist	—	19	3	16	6		Silty SAND; brownish gray, moist.
7										7	SM	
8	HA	—	—	—	WET	—	70	70	0	8		Silty SAND, brownish gray, wet,
9										9	SM	slt. fuel-like odor.

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

* Permit # T9601504

* (Previously SB10)

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:	PROJECT: CTO 0008 site 323	BORING NO. SB11
		TOTAL DEPTH: 9.0'
	JOB NO. 7113	LOGGED BY: G. Helms
	PROJ.MGR: G. Goode	EDITED BY:
	DRILLING CONTRACTOR: NA	
	DRILL RIG TYPE: NA	
See Soil Boring Location Map	DRILLER'S NAME NA	
	SAMPLING METHODS: Hand auger	
	STARTED TIME: 1910	DATE: 6/14/96
	COMPLETED TIME: 1930	DATE: 6/14/96
	BORING DEPTH (ft.) 9.0'	
	CASING DEPTH (ft.) NA	
	WATER DEPTH (ft.) —	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		
2	HA	–	–	–	moist	–	4	0	4	2		SAND, gray, fg-mg qtz., some silt,
3										X 3 X	SW	well graded, moist.
4	HA	–	–	–	moist	–	0	0	0	4		SAND, dk gray, fg-mg qtz., some
5										X 5 X	SW	silt, well graded, moist.
6	HA	–	–	–	moist	–	300	5	295	6		SAND, dk gray, fg-mg qtz., some
7										X 7 X	SW	silt, well graded, moist, strong fuel like odor.
8	HA	–	–	–	WET	–	350	80	270	8		Wet from 7.0'-7.5'. SAND, dk gray, fg-mg qtz., trace
9										X 9 X	SW	silt, well graded, wet, strong fuel like odor.

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:	PROJECT: CTO 0008. Site 323		BORING NO. SB12
			TOTAL DEPTH: 3.0'
	JOB NO.	7113	LOGGED BY: G. Helms
	PROJ.MGR:	G. Goode	EDITED BY:
	DRILLING CONTRACTOR:	NA	
See site Boring Location Map	DRILL RIG TYPE:	NA	
	DRILLER'S NAME	NA	
	SAMPLING METHODS:	Hand auger	
	STARTED TIME:	0800	DATE: 6/15/96
	COMPLETED TIME:	0820	DATE: 6/15/96
	BORING DEPTH (ft.)	3.0'	
	CASING DEPTH (ft.)	NA	
	WATER DEPTH (ft.)	—	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through 6 inches of Concrete prior to hand augering
2	HA	—	—	—	moist	—	0	0	0	2		SAND, lt. tan, fg-mg qtz., trace
3										X X 3	SW	silt, well graded, moist.
4										4		Auger refusal at 2.5'-3.0'.
5										5		
6										6		
7										7		
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:	PROJECT: CTO 0008 Site 323	BORING NO. SB13
		TOTAL DEPTH: 7.0'
	JOB NO. 7113	LOGGED BY: G. Helms
	PROJ.MGR: G. Goode	EDITED BY:
see site Boring Location Map	DRILLING CONTRACTOR: NA	
	DRILL RIG TYPE: NA	
	DRILLER'S NAME NA	
	SAMPLING METHODS: Hand auger	
	STARTED TIME: 0547	DATE: 6/15/96
	COMPLETED TIME:	DATE: 6/15/96
	BORING DEPTH (ft.) 7.0'	
	CASING DEPTH (ft.) NA	
	WATER DEPTH (ft.) —	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	
1										1		Cored through 6 inches of concrete prior to hand augering
2	HA	—	—	—	wet	—	0	0	0	2		SAND, lt. tan, fg-mg qtz., some silty blk material, well graded, wet (due to coring water).
3										X 3 X	SW	
4	HA	—	—	—	moist	—	5	3	2	4		SAND, lt. tan, fg-mg qtz., some silt, well graded, some debris (brick), moist.
5										X 5 X	SW	
6	HA	—	—	—	moist	—	380	12	368	6		SAND, lt. tan, fg-mg qtz., trace silt, well graded, moist, strong fuel-like odor.
7										X 7 X	SW	
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING: See Soil Boring Location Map	PROJECT: CTO 0008 Site 323	BORING NO. SB14
		TOTAL DEPTH: 9'
	JOB NO. 7113	LOGGED BY: C. Burgin
	PROJ.MGR: G. Goode	EDITED BY: G. Goode
	DRILLING CONTRACTOR: NA	
	DRILL RIG TYPE: NA	
	DRILLER'S NAME NA	
	SAMPLING METHODS: Hand Auger	
	STARTED TIME: 17:10	DATE: 7/12/96
	COMPLETED TIME: 17:32	DATE: 7/12/96
	BORING DEPTH (ft.) 9'	
	CASING DEPTH (ft.) NA	
	WATER DEPTH (ft.) —	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE
1										1	
2	HA	—	—	—	—	—	3	ND	3	2	
3										3	
4	HA	—	—	—	—	—	5	ND	5	4	
5										5	
6	HA	—	—	—	—	—	5	ND	5	6	
7										7	
8	HA	—	—	—	wet	—	ND	NS	ND	8	
9										9	

Due to the close proximity to SB13 the lithology of soil was not recorded. See log of boring for SB13 for soil description

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 2

LOCATION OF BORING:	PROJECT: CTO 0008. Site 323	BORING NO. PCY-323-MW01
		TOTAL DEPTH: 15.0'
	JOB NO. 7113	LOGGED BY: G. Helms
	PROJ.MGR: G. Goode	EDITED BY:
See Soil Boring Location Map	DRILLING CONTRACTOR: NA	
	DRILL RIG TYPE: NA	
	DRILLER'S NAME NA	
	SAMPLING METHODS: Hand auger; split spoon	
	STARTED TIME: 0930	DATE: 6/14/96
	COMPLETED TIME: 1016	DATE: 6/14/96
	BORING DEPTH (ft.) 15.0'	
	CASING DEPTH (ft.) NA	
	WATER DEPTH (ft.) —	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through 6 inches of concrete prior to boring.
2	HA	–	–	–	moist	–	0	0	0	2		SAND, tan to gray, fg-mg qtz., trace silt, well graded, moist.
3										3	SW	
4	HA	–	–	–	moist	–	0	0	0	4		SAND, tan to gray, fg-mg qtz., trace silt, well graded, moist.
5	SS									5	SW	
6		1/1	24"	24"	moist	–	120	6	114	6	SW	SAND, tan to gray, fg-mg qtz., trace silt, well graded, moist.
7		1/1				–				7	SP	6.5'-7.0' - lt. tan to buff, SAND, fg-mg qtz., predominantly medium grained, poorly graded, moist, fuel-like odor.
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

SHEET 2 OF 2

PCY-323-MWC

PROJECT: 7113 | NO. | BORING NO.

DEPTH	TYPE	BLOWS	DRIVEN	REC'VD'	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	
11	SS	4/3	24"	24"	WET	–	450	150	300		X	SAND, buff colored, fg-mg qtz., predominantly med. grained, poorly graded, moist, strong fuel-like odor.
12		4/4				–				1	X	
13											X	
14										2	X	
										3		TD = 15.0'
										4		
										5		
										6		
										7		
										8		
										9		
										0		
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										0		

SP

SOIL//SEDIMENT DESCRIPTION

APPENDIX F

HEADSPACE METHODOLOGY FOR DETERMINING SOIL ORGANIC VAPOR CONCENTRATIONS

HEADSPACE METHODOLOGY FOR DETERMINING SOIL ORGANIC VAPOR CONCENTRATION

Soil headspace readings where obtained utilizing the following method which conforms to the requirements of Rule 62-770.200(2), FAC.

Two 16 ounce glass soil jars were half-filled with soil sample (duplicate samples). The soil jars were then sealed utilizing "mason jar" type open top screw on caps with foil in place of the conventional solid jar tops. The soil samples were allowed to equilibrate to ambient temperature which was within the FDEP temperature range.

The samples were tested with a Foxboro Century 128, an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). Prior to each days activities, the OVA was field calibrated with 100 ppm methane in air, in accordance with the manufacturers specifications. Sample testing was performed by inserting the OVA probe through the foil sample cover and recording the highest OVA reading. Following collection of this OVA reading, the OVA was fitted with a granular activated carbon filter probe. The OVA was then used to test the headspace above the duplicate sample. Carbon absorbs petroleum hydrocarbons and thus the filtered reading is assumed to represent naturally occurring organic vapors.

Upon completion of the screening exercise, the carbon filtered result was subtracted from the un-filtered result, to obtain a net petroleum vapor value. In accordance with Rule 17(62)-770.200(2), F.A.C., and Guidelines for Assessment and Remediation of Petroleum Contaminated Soil (May 1994) corrected headspace levels in excess of 50 ppm is defined as excessively contaminated soil for diesel and used oil contaminated soil. Corrected headspace levels in excess of 10 ppm but less than 50 ppm are considered as contaminated, though not excessively contaminated.

APPENDIX G

WELL COMPLETION LOGS

WELL COMPLETION LOG

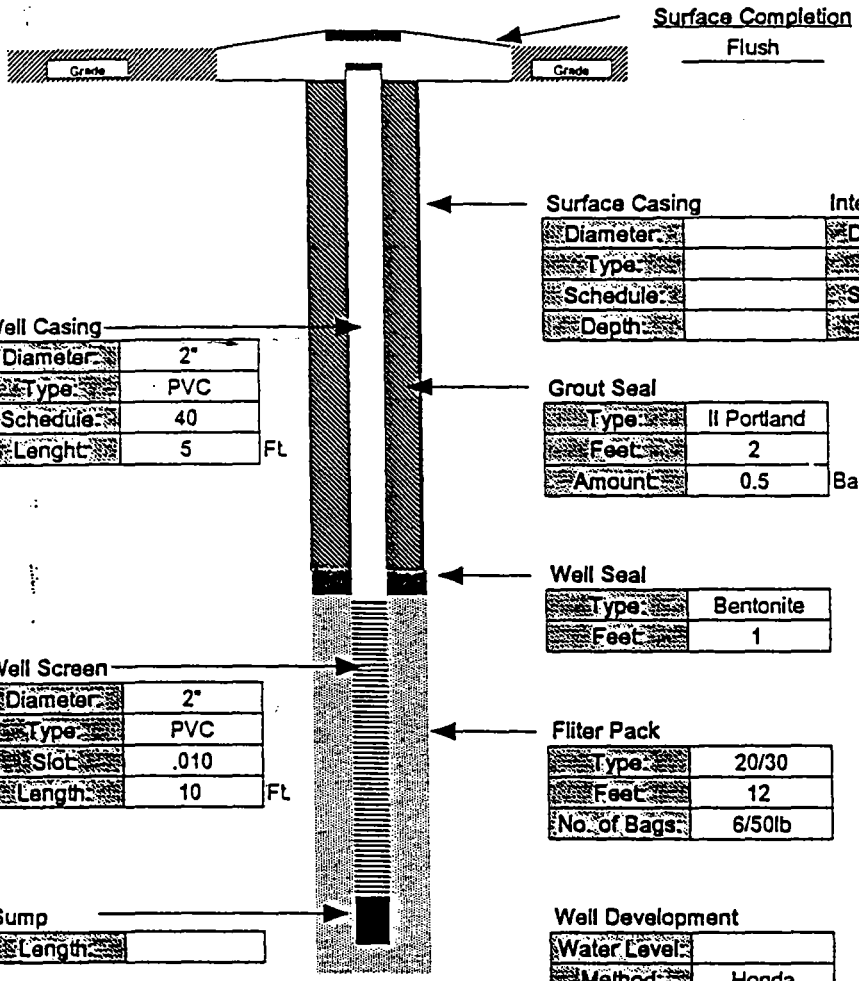
Water Mgmt. Dist.: NWFWMD
Permit Number:

Work Order: 6028
Type of Well: Monitor
Well Number: PCY323MW1
Method Used: 4¼" HSA
Borehole Dia. 8"

Site Information:
Name: CSS Panama City - Phase 1
Address: Site G9, 323 and 333
C,S,Z: Panama City, Florida
S/T/R:

Client / Consultant Information
Consultant: Brown & Root
Field Rep: Gerry Goode

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	15	10	5	0.5	6/50lb	20/30	Bentonite
.40 ←	Schedule	Slot Size: →	.010		2	← Feet →	12	1



Surface Completion
Flush

Surface Casing

Diameter:	
Type:	
Schedule:	
Depth:	

Intermediate Casing

Diameter:	
Type:	
Schedule:	
Depth:	

Well Casing

Diameter:	2"
Type:	PVC
Schedule:	40
Lenght:	5 Ft

Grout Seal

Type:	II Portland
Feet:	2
Amount:	0.5 Bags

Well Seal

Type:	Bentonite
Feet:	1

Well Screen

Diameter:	2"
Type:	PVC
Slot:	.010
Length:	10 Ft

Fliter Pack

Type:	20/30
Feet:	12
No. of Bags:	6/50lb

Sump

Length:	

Well Development

Water Level:			
Method:	Honda		
Start: →	Dark	Finish: →	Clear
Time:			
GPM:			

Contractor Information

Contractor #:	2633
Completion:	06/14/96
Driller:	Charles Bucher
Lead Hand:	Scott Robinson
3rd Man:	Todd Flick
Drill Rig:	D120C

Company: Groundwater Protection, Inc.
Address: 4315 S.W. 34th Street
C,S,Z: Orlando, Florida 32811
Phone/FAX: (407) 426-7885 / (407) 426-7586

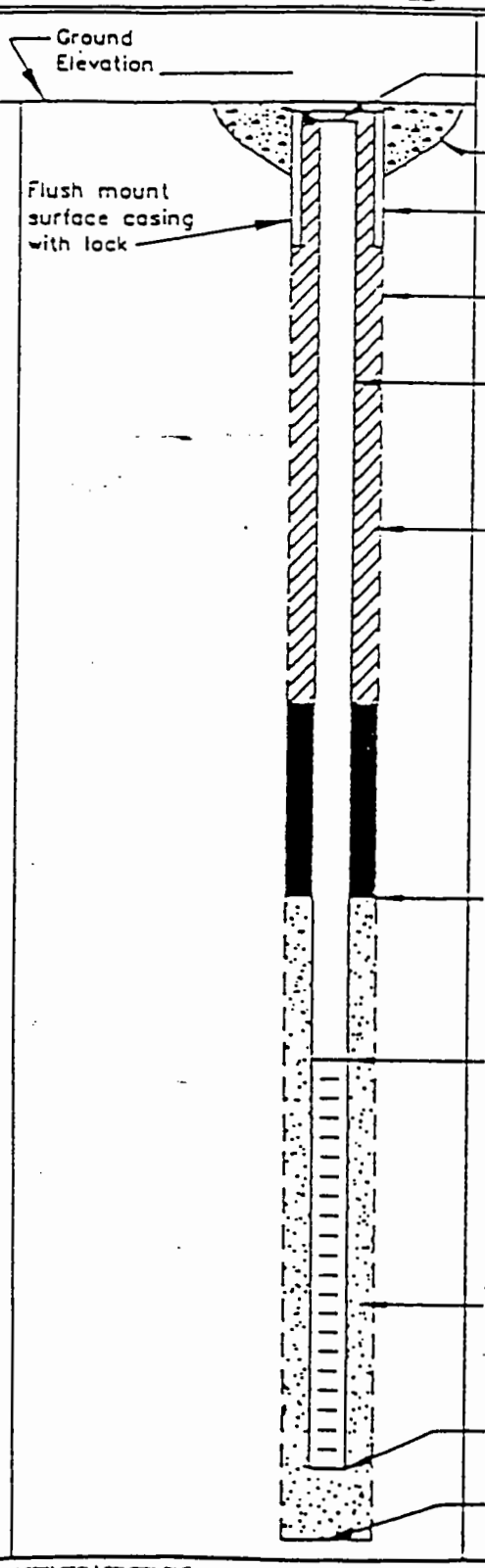
BORING NO.: _____

MONITORING WELL SHEET

PROJECT 7113
PROJECT NO. _____
ELEVATION _____
FIELD GEOLOGIST Ginny Helms

LOCATION Site 323
BORING PCY-323-MW01
DATE 6/14/96

DRILLER Charles Bucher
DRILLING METHOD HSA
DEVELOPMENT METHOD _____



ELEVATION TOP OF RISER: _____

TYPE OF SURFACE SEAL: Concrete

TYPE OF PROTECTIVE CASING: _____

I.D. OF PROTECTIVE CASING: _____

DIAMETER OF HOLE: 8 inch

TYPE OF RISER PIPE: PVC

RISER PIPE I.D.: 40 schedule

TYPE OF BACKFILL/SEAL: Bentonite Chips (cetco) medium, 3.0' bls to 2.0' bls

DEPTH/ELEVATION TOP OF SAND: 3.0' bls

DEPTH/ELEVATION TOP OF SCREEN: 5.0' / bls

TYPE OF SCREEN: Schedule 40 pvc

SLOT SIZE x LENGTH: .010 10.0 ft

TYPE OF SAND PACK: Sand & Silica

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 15.0 / bls

DEPTH/ELEVATION BOTTOM OF SAND: 15.0 / bls

DEPTH/ELEVATION BOTTOM OF HOLE: 15.0 / bls

BACKFILL MATERIAL BELOW SAND: _____

APPENDIX H

FIELD MEASUREMENTS AND SAMPLING FORMS

ATTACHMENT C-1
EXAMPLE GROUNDWATER LEVEL MEASUREMENT SHEET

GROUNDWATER LEVEL MEASUREMENT SHEET

Page ___ of ___

PROJECT NAME: 7 323
PROJECT NUMBER: 711
PERSONNEL: C. Burgin
DATE: 6-15-96
WEATHER CONDITIONS: Hot, clear, calm

LOCATION:
MEASURING DEVICE:
ADJUSTMENT FACTOR:
REMARKS:

Well or Piezometer Number	Time*	Elevation of Reference Point (Feet)	Water Level Indicator Reading (Feet)	Groundwater Elevation (Feet)	Comments
323-MW6	0900		6.62		

*Measurements to nearest 0.01 foot.

Signature(s): _____

ATTACHMENT C-1
EXAMPLE GROUNDWATER LEVEL MEASUREMENT SHEET

GROUNDWATER LEVEL MEASUREMENT SHEET

Page 1 of 1

PROJECT NAME: CTO-0008
PROJECT NUMBER: 7113
PERSONNEL: C. Burgin
DATE: 7-12-96
WEATHER CONDITIONS: Hot, Calm, clear

LOCATION: 323
MEASURING DEVICE: Water Level Indicator
ADJUSTMENT FACTOR:
REMARKS:

Well or Piezometer Number	Time	Elevation at Reference Point (Feet)	Water Level Indicator Reading (Feet)	Groundwater Elevation (Feet)	Comments
MW01				6.30	

*Measurements to nearest 0.01 foot.

Signature(s):

Brown & Root Environmental | SAMPLING LOG | Page 1 of 1

BRE Project No: 7413 | Date: 7-12-96 | Sampler(s): C. Aucoin

Client Site ID: CTA-0008 323 | Facility Address: Coastal System Station PC4

Weather: Hot clear calm | Sampling Method: Teflon Bailer (Y) N Other _____ | SOP Cleaning Y N

Comments:

GROUNDWATER SYSTEM PERFORMANCE AND QUALITY CONTROL SAMPLES											TEST PARAMETERS			
A	B	C	D	E	Sample ID	Time	Source	pH	Temp.	Sp. Cond.		Test Method	Container Type	Preserv. Type
							GWS Influent				A			
							GWS Effluent				B			
							Equipment Blank				C			
							Equipment Blank				D			
							Trip Blank				E			
							Duplicate ( )							
							Duplicate ( )							

GROUNDWATER SAMPLES											TD	Csg Dia (in)	DTW	Purge Vol
					323-GW-MW01-001			7.08	30.1°C	148 us	34.45	2"	6.30	7 Gals
								7.02	29.9°C	204 us				
								6.94	27.4°C	191 us				
								7.10	29.6°C	186 us				

UNITS: TEMPERATURE = DEGREES CELSIUS/pH = STANDARD UNITS/SPECIFIC CONDUCTANCE = UMHOS/CM

WELL CASING VOLUMES (GALLONS/FT OF SATURATED CASING, FOR 5x PURGE) 1.25" = 0.32 / 2" = 0.82 / 4" = 3.27 / 6" = 7.35

NOTE: A 3x PURGE IS OK FOR: 4" = 1.96 / 6" = 4.41, PROVIDED 3 CONSISTENT REPEAT FIELD METER READINGS ARE OBSERVED

SINGLE SAMPLE LOG SHEET

Project Site Name: CTO-0008 323

Sample ID No.: 323-SS-SB14-0608

Project No.: 7113

Sample Location: SB14

- ☐ Surface Soil
- ☒ Subsurface Soil
- ☐ Sediment
- ☐ Other _____
- ☐ QA Sample Type: _____

Sampled By: C. Burgin

C.O.C. No.: —

Sample Method: Hand Auger

Depth Sampled: 6' To 8'

Sample Date and Time: 7-12-96 / 1732

Type of Sample
- ☐ Grab
- ☒ Composite
- ☐ Grab-Composite
- ☐ High Concentration
- ☐ Low Concentration

Composite Sample Data

Sample	Time	Color/Description

Grab Sample Data

Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
Whitish/Brow	Sandy

Analysis	Container Requirements	Collected (✓)
RCRA 8 Total-metals		✓
TCLP metals		✓
8030/8260		✓
8270		✓
418.1		✓

Map:

Observations/Notes:

Circle if Applicable: ~~MS/MSD~~

Duplicate ID No:

Signature(s):

SINGLE SAMPLE LOG SHEET

Project Site Name: CTO-0008 323

Project No.: 7113

- ☐ Surface Soil
- ☐ Subsurface Soil
- ☐ Sediment
- ☒ Other Groundwater
- ☐ QA Sample Type: _____

Sample ID No.: _____

Sample Location: _____

Sampled By: _____

C.O.C. No.: _____

Sample Method: Disposable Teflon bailer

Depth Sampled: 6.30 To 14.65

Sample Date and Time: 7-12-96 / 1320

Type of Sample
- ☒ Grab
- ☐ Composite
- ☐ Grab-Composite
- ☐ High Concentration
- ☐ Low Concentration

Composite Sample Data

Sample	Time	Color/Description

Grab Sample Data

Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)

Analysis	Container Requirements	Collected (✓)
601	40 ml	✓
602	40 ml	✓
8260	40 ml	✓
504	125 ml	✓
239.2	500 ml	✓
Arsenic Cadmium Chromium		✓
418.1	1 liter	✓
610	1 liter	✓

Map:

Observations/Notes:

Circle if Applicable:

MS/MSD

Duplicate ID No:

Signature(s):

APPENDIX I

SOIL LABORATORY DATA SHEETS

(Soil Sample Collected July 12, 1996)

GC/MS VOLATILE ORGANICS

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

QAL Lab Reference No./SDG. MB382

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: N/A

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: SW-846 8260

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: As requested, the matrix spikes were performed using a sample from sample delivery group MB382 (MB382001MS and MB382001MSD). The absolute recoveries for 2-Chloroethylvinyl ether were below advisory QC criteria in the matrix spike and matrix spike duplicate. All other advisory acceptance criteria were met. A copy of the results is provided for your review.

E. Samples: Sample analysis proceeded normally.

F. Other: Please note that the Form 1's reflect the specified target list.

Currently, there are not enough data points collected to produce control charts for the soil surrogate recoveries. These charts are in the process of being developed.

A summary of the most current applicable method detection limits (MDLs) immediately follows the case narrative.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Misty L. Rice for DATE: 8/6/96
Debra A. Vergin
Chemist

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH[1]
MB382001	323-068	SOIL	07/12/96	N/A	07/17/96	N/A
MB382001MS	323-068MS	SOIL	07/12/96	N/A	07/17/96	N/A
MB382001MSD	323-068MSD	SOIL	07/12/96	N/A	07/17/96	N/A
Y07176B1	VBLK0N	SOIL	N/A	N/A	07/17/96	N/A

[1] Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: SOIL

Analytical Method: SW8260 Extraction Method: _____

	MDL ug/Kg
Acetone	2.05
Acetonitrile	3.79
Acrolein	6.91
Acrylonitrile	3.64
Benzene	0.54
Bromobenzene	0.76
Bromochloromethane	0.53
Bromodichloromethane	1.01
Bromofluorobenzene	2.23
Bromoform	0.99
Bromomethane	1.79
2-Butanone	2.34
Carbon Disulfide	0.59
Carbon Tetrachloride	0.56
Chlorobenzene	0.81
Chloroethane	1.01
2-Chloroethylvinyl ether	1.43
Chloroform	0.77
Chloromethane	0.39
Chloroprene	0.29
3-Chloropropene	0.19
2-Chlorotoluene	0.87
4-Chlorotoluene	1.30
Cis-1,2-Dichloroethene	0.83
cis-1,3-Dichloropropene	0.69
Cyclohexanone	5.89
1,2-Dibromo-3-chloropropane	3.33
Dibromochloromethane	0.67
1,2-Dibromoethane	0.82
Dibromofluoromethane	1.68
Dibromomethane	0.83
1,2-Dichlorobenzene	0.74
1,3-Dichlorobenzene	0.84
1,4-Dichlorobenzene	0.73
Dichlorodifluoromethane	0.43
1,1-Dichloroethane	0.65
1,2-Dichloroethane	0.50
1,1-Dichloroethene	0.73
1,2-Dichloroethene (total)	1.68
Dichlorofluoromethane	0.14
1,2-Dichloropropane	0.50
1,3-Dichloropropane	0.81
2,2-Dichloropropane	0.86

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: SOIL

Analytical Method: SW8260 Extraction Method:

	MDL ug/Kg
1,1-Dichloropropene	0.58
1,4-Dioxane	6.38
Ethyl ether	0.18
Ethyl methacrylate	0.27
Ethylbenzene	0.81
Hexachlorobutadiene	1.25
2-Hexanone	2.36
Iodomethane	2.81
Isobutyl alcohol	8.17
Isopropylbenzene	0.66
m-,p-Xylene	1.53
Methacrylonitrile	0.43
Methyl methacrylate	0.27
Methyl tert-butyl ether	0.16
4-Methyl-2-pentanone	1.82
Methylene Chloride	1.31
n-Butylbenzene	0.79
n-Propylbenzene	0.71
Naphthalene	1.44
o-Xylene	0.63
p-Isopropyltoluene	0.75
Pentachloroethane	0.39
Propionitrile	3.50
sec-Butylbenzene	0.89
Styrene	0.77
tert-Butylbenzene	0.88
1,1,1,2-Tetrachloroethane	0.82
1,1,2,2-Tetrachloroethane	2.79
Tetrachloroethene	0.60
Toluene	0.74
Toluene-d8	1.76
trans-1,2-Dichloroethene	0.78
trans-1,3-Dichloropropene	0.61
trans-1,4-Dichloro-2-butene	0.14
1,1,2-Trichloro-1,2,2-trifluoroet	0.22
1,2,3-Trichlorobenzene	0.77
1,2,4-Trichlorobenzene	0.88
1,1,1-Trichloroethane	0.74
1,1,2-Trichloroethane	0.88
Trichloroethene	1.40
Trichlorofluoromethane	0.80
1,2,3-Trichloropropane	1.13
1,2,4-Trimethylbenzene	0.87

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: SOIL

Analytical Method: SW8260 Extraction Method:

	MDL ug/Kg
1,3,5-Trimethylbenzene	0.88
Vinyl acetate	1.11
Vinyl Chloride	0.51
Xylene (total)	1.53

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VH038986.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 Date Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
75-01-4	Vinyl chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-09-2	Methylene chloride	11	U
156-60-5	trans-1,2-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon tetrachloride	11	U
71-43-2	Benzene	2	J
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	11	U
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
110-75-8	2-Chloroethylvinyl ether	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-88-3	Toluene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
124-48-1	Dibromochloromethane	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
75-25-2	Bromoform	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

323-068

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: C1VH038986.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 Data Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

SW846-8260

Quality Analytical Laboratories

VOLATILE REPORT SW-846 METHOD 8260

Data file : /chem/ms6.i/c071796b.b/C1VH038986.d
Lab Smp Id: MB382001 Client Smp ID: 323-068
Inj Date : 17-JUL-1996 15:08
Operator : P.BAILEY Inst ID: ms6.i
Smp Info : MB382001 323-068
Misc Info : 5GRS--5MLS DF=1
Comment :
Method : /chem/ms6.i/c071796b.b/8260s.m
Meth Date : 20-Jul-1996 22:26 whall Quant Type: ISTD
Cal Date : 12-JUL-1996 16:16 Cal File: CSIX038930.d
Als bottle: 1
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: B&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/(Ws * (100 - M)/100)

Name	Value	Description
Uf	1.000	ng unit correction factor
Ws	5.000	Weight of sample extracted (g)
M	9.000	% Moisture (not decanted)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/Kg)
* 1 Pentafluorobenzene	168.00	12.100	12.100	(1.000)	136819	50	
3 Chloromethane	50.00		4.350	Compound Not Detected.			
4 Vinyl chloride	62.00		4.800	Compound Not Detected.			
5 Bromomethane	94.00		6.250	Compound Not Detected.			
6 Chloroethane	64.00		6.583	Compound Not Detected.			
7 Trichlorofluoromethane	101.00		7.250	Compound Not Detected.			
11 1,1-Dichloroethene	96.00		8.650	Compound Not Detected.			
16 Methylene chloride	84.00	9.667	9.617	(0.799)	1935	1	
19 trans-1,2-Dichloroethene	96.00		10.117	Compound Not Detected.			
21 1,1-Dichloroethane	63.00		10.833	Compound Not Detected.			
31 Chloroform	83.00		11.983	Compound Not Detected.			
33 1,1,1-Trichloroethane	97.00		12.550	Compound Not Detected.			
35 Carbon tetrachloride	117.00		12.900	Compound Not Detected.			
* 36 1,4-Difluorobenzene	114.00	13.517	13.517	(1.000)	173332	50	
37 1,2-Dichloroethane	62.00		14.217	Compound Not Detected.			
38 Benzene	78.00	13.267	13.150	(0.982)	5782	1	2(a)
39 Trichloroethene	95.00		13.983	Compound Not Detected.			
41 1,2-Dichloropropane	63.00		14.233	Compound Not Detected.			
43 Bromodichloromethane	83.00		14.550	Compound Not Detected.			
45 2-Chloroethylvinyl ether	63.00		14.950	Compound Not Detected.			
46 cis-1,3-Dichloropropene	75.00		15.300	Compound Not Detected.			

~~1ug~~ below PQL WEH 7/31/96

Rev MTP 7/25 PB 7/23/

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/Kg)
* 48 Chlorobenzene-d5	117.00	17.833	17.850	(1.000)	148501	50	
49 Toluene	91.00		15.767	Compound Not Detected.			
51 trans-1,3-Dichloropropene	75.00		15.983	Compound Not Detected.			
52 1,1,2-Trichloroethane	83.00		16.217	Compound Not Detected.			
55 Tetrachloroethene	166.00		16.700	Compound Not Detected.			
56 Dibromochloromethane	129.00		16.983	Compound Not Detected.			
58 Chlorobenzene	112.00		17.900	Compound Not Detected.			
60 Ethylbenzene	91.00		17.967	Compound Not Detected.			
66 Bromoform	173.00		19.333	Compound Not Detected.			
68 1,1,2,2-Tetrachloroethane	83.00		19.550	Compound Not Detected.			
* 69 1,4-Dichlorobenzene-d4	152.00	21.533	21.550	(1.000)	70219	50	
$ 91 Dibromofluoromethane	113.00	12.283	12.283	(1.015)	91636	52	57
$ 92 1,2-Dichloroethane-d4	65.00	12.983	12.983	(0.961)	59374	55	60
$ 93 Toluene-d8	98.00	15.650	15.650	(0.878)	173963	54	59
$ 94 Bromofluorobenzene	174.00	19.667	19.683	(1.103)	75520	50	55

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms6.i/c071796b.b/C1VH038986.d
Lab Smp Id: MB382001 Client Smp ID: 323-068
Inj Date : 17-JUL-1996 15:08
Operator : P.BAILEY Inst ID: ms6.i
Smp Info : MB382001 323-068
Misc Info : 5GRS--5MLS DF=1
Comment :
Method : /chem/ms6.i/c071796b.b/8260s.m
Meth Date : 20-Jul-1996 22:26 whall
Cal Date : 12-JUL-1996 16:16 Cal File: CSIX038930.d
Als bottle: 1
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: B&ROOT.sub
Sample Matrix: SOIL
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0N

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: Y07176B1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBVH038977.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec. 0 Date Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
110-75-8	2-Chloroethylvinyl ether	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U

MTP/SAN

FORM I VOA

SW846-826

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK0N

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: Y07176B1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CBVH038977.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec. 0 Data Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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Quality Analytical Laboratories

VOLATILE REPORT SW-846 METHOD 8260

Data file : /chem/ms6.i/c071796b.b/CBVH038977.d
Lab Smp Id: Y07176B1 Client Smp ID: VBLK0N
Inj Date : 17-JUL-1996 09:12
Operator : P.BAILEY Inst ID: ms6.i
Smp Info : Y07176B1 VBLK0N
Misc Info : 5GRS--5MLS DF=1
Comment :
Method : /chem/ms6.i/c071796b.b/8260s.m
Meth Date : 19-Jul-1996 06:53 pbailey Quant Type: ISTD
Cal Date : 12-JUL-1996 16:16 Cal File: CSIX038930.d
Als bottle: 1 QC Sample: BLANK
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: B&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/(Ws * (100 - M)/100)

Name	Value	Description
Uf	1.000	ng unit correction factor
Ws	5.000	Weight of sample extracted (g)
M	0.000	% Moisture (not decanted)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/Kg)
* 1 Pentafluorobenzene	168.00	12.117	12.100	(1.000)	161909	50	
3 Chloromethane	50.00		4.350	Compound Not Detected.			
4 Vinyl chloride	62.00		4.800	Compound Not Detected.			
5 Bromomethane	94.00		6.250	Compound Not Detected.			
6 Chloroethane	64.00		6.583	Compound Not Detected.			
7 Trichlorofluoromethane	101.00		7.250	Compound Not Detected.			
11 1,1-Dichloroethene	96.00		8.650	Compound Not Detected.			
16 Methylene chloride	84.00		9.617	Compound Not Detected.			
19 trans-1,2-Dichloroethene	96.00		10.117	Compound Not Detected.			
21 1,1-Dichloroethane	63.00		10.833	Compound Not Detected.			
31 Chloroform	83.00		11.983	Compound Not Detected.			
33 1,1,1-Trichloroethane	97.00		12.550	Compound Not Detected.			
35 Carbon tetrachloride	117.00		12.900	Compound Not Detected.			
* 36 1,4-Difluorobenzene	114.00	13.517	13.517	(1.000)	196007	50	
37 1,2-Dichloroethane	62.00		14.217	Compound Not Detected.			
38 Benzene	78.00		13.150	Compound Not Detected.			
39 Trichloroethene	95.00		13.983	Compound Not Detected.			
41 1,2-Dichloropropane	63.00		14.233	Compound Not Detected.			
43 Bromodichloromethane	83.00		14.550	Compound Not Detected.			
45 2-Chloroethylvinyl ether	63.00		14.950	Compound Not Detected.			
46 cis-1,3-Dichloropropene	75.00		15.300	Compound Not Detected.			

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/Kg)
* 48 Chlorobenzene-d5	117.00	17.850	17.850	(1.000)	185079	50	
49 Toluene	91.00		15.767		Compound Not Detected.		
51 trans-1,3-Dichloropropene	75.00		15.983		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		16.217		Compound Not Detected.		
55 Tetrachloroethene	166.00		16.700		Compound Not Detected.		
56 Dibromochloromethane	129.00		16.983		Compound Not Detected.		
58 Chlorobenzene	112.00		17.900		Compound Not Detected.		
60 Ethylbenzene	91.00		17.967		Compound Not Detected.		
66 Bromoform	173.00		19.333		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		19.550		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	21.567	21.550	(1.000)	109960	50	
$ 91 Dibromofluoromethane	113.00	12.283	12.283	(1.014)	99968	48	48
$ 92 1,2-Dichloroethane-d4	65.00	12.983	12.983	(0.961)	62146	50	50
$ 93 Toluene-d8	98.00	15.667	15.650	(0.878)	194654	48	48
$ 94 Bromofluorobenzene	174.00	19.683	19.683	(1.103)	100810	53	53

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068MS

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001MS

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CMVH038987.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 Date Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	56	
75-01-4	Vinyl chloride	54	
74-83-9	Bromomethane	49	
75-00-3	Chloroethane	64	
75-69-4	Trichlorofluoromethane	41	
75-35-4	1,1-Dichloroethene	53	
75-09-2	Methylene chloride	55	
156-60-5	trans-1,2-Dichloroethene	53	
75-34-3	1,1-Dichloroethane	56	
67-66-3	Chloroform	55	
71-55-6	1,1,1-Trichloroethane	52	
56-23-5	Carbon tetrachloride	41	
71-43-2	Benzene	55	
107-06-2	1,2-Dichloroethane	51	
79-01-6	Trichloroethene	53	
78-87-5	1,2-Dichloropropane	54	
75-27-4	Bromodichloromethane	52	
110-75-8	2-Chloroethylvinyl ether	26	
10061-01-5	cis-1,3-Dichloropropene	51	
108-88-3	Toluene	54	
10061-02-6	trans-1,3-Dichloropropene	54	
79-00-5	1,1,2-Trichloroethane	55	
127-18-4	Tetrachloroethene	47	
124-48-1	Dibromochloromethane	54	
108-90-7	Chlorobenzene	53	
100-41-4	Ethylbenzene	50	
75-25-2	Bromoform	52	
79-34-5	1,1,2,2-Tetrachloroethane	50	

Quality Analytical Laboratories

VOLATILE REPORT SW-846 METHOD 8260

Data file : /chem/ms6.i/c071796b.b/CMVH038987.d
Lab Smp Id: MB382001MS Client Smp ID: 323-068MS
Inj Date : 17-JUL-1996 15:43
Operator : P.BAILEY Inst ID: ms6.i
Smp Info : MB382001MS 323-068MS
Misc Info : 5GRS--5MLS DF=1
Comment :
Method : /chem/ms6.i/c071796b.b/8260s.m
Meth Date : 20-Jul-1996 22:26 whall Quant Type: ISTD
Cal Date : 12-JUL-1996 16:16 Cal File: CSIX038930.d
Als bottle: 1 QC Sample: MS
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: B&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/(Ws * (100 - M)/100)

Name	Value	Description
Uf	1.000	ng unit correction factor
Ws	5.000	Weight of sample extracted (g)
M	9.000	% Moisture (not decanted)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/Kg)
* 1 Pentafluorobenzene	168.00	12.117	12.100	(1.000)	126454	50	
3 Chloromethane	50.00	4.467	4.350	(0.369)	93278	51	56
4 Vinyl chloride	62.00	4.900	4.800	(0.404)	78039	49	54
5 Bromomethane	94.00	6.367	6.250	(0.525)	38676	45	49
6 Chloroethane	64.00	6.700	6.583	(0.553)	49599	58	64
7 Trichlorofluoromethane	101.00	7.383	7.250	(0.609)	57439	38	41
11 1,1-Dichloroethene	96.00	8.733	8.650	(0.721)	60075	48	53
16 Methylene chloride	84.00	9.667	9.617	(0.798)	67024	50	55
19 trans-1,2-Dichloroethene	96.00	10.167	10.117	(0.839)	65787	48	53
21 1,1-Dichloroethane	63.00	10.867	10.833	(0.897)	130149	51	56
31 Chloroform	83.00	11.983	11.983	(0.989)	112731	50	55
33 1,1,1-Trichloroethane	97.00	12.550	12.550	(1.036)	80895	47	52
35 Carbon tetrachloride	117.00	12.917	12.900	(1.066)	50834	37	41
* 36 1,4-Difluorobenzene	114.00	13.517	13.517	(1.000)	167853	50	
37 1,2-Dichloroethane	62.00	14.233	14.217	(1.053)	62688	47	51
38 Benzene	78.00	13.150	13.150	(0.973)	192771	50	55
39 Trichloroethene	95.00	13.983	13.983	(1.035)	72023	48	53
41 1,2-Dichloropropane	63.00	14.233	14.233	(1.053)	82488	49	54
43 Bromodichloromethane	83.00	14.550	14.550	(1.076)	103420	47	52
45 2-Chloroethylvinyl ether	63.00	14.950	14.950	(1.106)	16821	23	26(R)
46 cis-1,3-Dichloropropene	75.00	15.283	15.300	(1.131)	103284	46	51

Rev MSP 7/ pp 7/23/

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/Kg)
* 48 Chlorobenzene-d5	117.00	17.833	17.850	(1.000)	146308	50	
49 Toluene	91.00	15.767	15.767	(0.884)	182554	49	54
51 trans-1,3-Dichloropropene	75.00	15.983	15.983	(0.896)	85502	49	54
52 1,1,2-Trichloroethane	83.00	16.217	16.217	(0.909)	59537	50	55
55 Tetrachloroethene	166.00	16.700	16.700	(0.936)	66867	43	47
56 Dibromochloromethane	129.00	16.983	16.983	(0.952)	90595	50	54
58 Chlorobenzene	112.00	17.900	17.900	(1.004)	127539	48	53
60 Ethylbenzene	91.00	17.967	17.967	(1.007)	183108	46	50
66 Bromoform	173.00	19.317	19.333	(1.083)	77241	47	52
68 1,1,2,2-Tetrachloroethane	83.00	19.533	19.550	(1.095)	115487	45	50
* 69 1,4-Dichlorobenzene-d4	152.00	21.550	21.550	(1.000)	65578	50	
$ 91 Dibromofluoromethane	113.00	12.300	12.283	(1.015)	85229	52	58
$ 92 1,2-Dichloroethane-d4	65.00	12.983	12.983	(0.961)	54084	51	56
$ 93 Toluene-d8	98.00	15.650	15.650	(0.878)	170194	53	58
$ 94 Bromofluorobenzene	174.00	19.667	19.683	(1.103)	71805	48	53

QC Flag Legend

R - Spike/Surrogate failed recovery limits.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068MSD

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001MSD

Sample wt/vol: 5.0 (g/mL) G Lab File ID: CMVH038988.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 Date Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	54	
75-01-4	Vinyl chloride	53	
74-83-9	Bromomethane	49	
75-00-3	Chloroethane	62	
75-69-4	Trichlorofluoromethane	42	
75-35-4	1,1-Dichloroethene	52	
75-09-2	Methylene chloride	55	
156-60-5	trans-1,2-Dichloroethene	54	
75-34-3	1,1-Dichloroethane	56	
67-66-3	Chloroform	55	
71-55-6	1,1,1-Trichloroethane	52	
56-23-5	Carbon tetrachloride	44	
71-43-2	Benzene	56	
107-06-2	1,2-Dichloroethane	52	
79-01-6	Trichloroethene	53	
78-87-5	1,2-Dichloropropane	54	
75-27-4	Bromodichloromethane	53	
110-75-8	2-Chloroethylvinyl ether	27	
10061-01-5	cis-1,3-Dichloropropene	51	
108-88-3	Toluene	54	
10061-02-6	trans-1,3-Dichloropropene	54	
79-00-5	1,1,2-Trichloroethane	55	
127-18-4	Tetrachloroethene	48	
124-48-1	Dibromochloromethane	54	
108-90-7	Chlorobenzene	54	
100-41-4	Ethylbenzene	53	
75-25-2	Bromoform	52	
79-34-5	1,1,2,2-Tetrachloroethane	49	

FORM I VOA

SW846-82

Quality Analytical Laboratories

VOLATILE REPORT SW-846 METHOD 8260

Data file : /chem/ms6.i/c071796b.b/CMVH038988.d
Lab Smp Id: MB382001MSD Client Smp ID: 323-068MSD
Inj Date : 17-JUL-1996 16:20
Operator : P.BAILEY Inst ID: ms6.i
Smp Info : MB382001MSD 323-068MSD
Misc Info : 5GRS--5MLS DF=1
Comment :
Method : /chem/ms6.i/c071796b.b/8260s.m
Meth Date : 20-Jul-1996 22:26 whall Quant Type: ISTD
Cal Date : 12-JUL-1996 16:16 Cal File: CSIX038930.d
Als bottle: 1 QC Sample: MSD
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: B&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/(Ws * (100 - M)/100)

Name	Value	Description
Uf	1.000	ng unit correction factor
Ws	5.000	Weight of sample extracted (g)
M	9.000	% Moisture (not decanted)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/Kg)
* 1 Pentafluorobenzene	168.00	12.100	12.100	(1.000)	124712	50	
3 Chloromethane	50.00	4.450	4.350	(0.368)	88669	49	54
4 Vinyl chloride	62.00	4.867	4.800	(0.402)	75173	48	53
5 Bromomethane	94.00	6.350	6.250	(0.525)	38414	45	49
6 Chloroethane	64.00	6.683	6.583	(0.552)	47762	56	62
7 Trichlorofluoromethane	101.00	7.383	7.250	(0.610)	57663	38	42
11 1,1-Dichloroethene	96.00	8.717	8.650	(0.720)	58286	47	52
16 Methylene chloride	84.00	9.650	9.617	(0.798)	65989	50	55
19 trans-1,2-Dichloroethene	96.00	10.133	10.117	(0.837)	65702	49	54
21 1,1-Dichloroethane	63.00	10.833	10.833	(0.895)	128522	51	56
31 Chloroform	83.00	11.967	11.983	(0.989)	111454	50	55
33 1,1,1-Trichloroethane	97.00	12.533	12.550	(1.036)	80482	47	52
35 Carbon tetrachloride	117.00	12.900	12.900	(1.066)	53980	40	44
* 36 1,4-Difluorobenzene	114.00	13.517	13.517	(1.000)	164511	50	
37 1,2-Dichloroethane	62.00	14.233	14.217	(1.053)	61547	47	52
38 Benzene	78.00	13.150	13.150	(0.973)	190863	51	56
39 Trichloroethene	95.00	13.983	13.983	(1.035)	71322	48	53
41 1,2-Dichloropropane	63.00	14.233	14.233	(1.053)	80926	49	54
43 Bromodichloromethane	83.00	14.550	14.550	(1.076)	103357	48	53
45 2-Chloroethylvinyl ether	63.00	14.950	14.950	(1.106)	17615	25	27(R)
46 cis-1,3-Dichloropropene	75.00	15.300	15.300	(1.132)	102362	47	51

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/Kg)
* 48 Chlorobenzene-d5	117.00	17.850	17.850	(1.000)	145575	50	
49 Toluene	91.00	15.767	15.767	(0.883)	180869	49	54
51 trans-1,3-Dichloropropene	75.00	16.000	15.983	(0.896)	84396	49	54
52 1,1,2-Trichloroethane	83.00	16.233	16.217	(0.909)	59361	50	55
55 Tetrachloroethene	166.00	16.700	16.700	(0.936)	68304	44	48
56 Dibromochloromethane	129.00	16.983	16.983	(0.951)	90190	50	54
58 Chlorobenzene	112.00	17.900	17.900	(1.003)	129921	49	54
60 Ethylbenzene	91.00	17.983	17.967	(1.007)	191805	48	53
66 Bromoform	173.00	19.317	19.333	(1.082)	76395	47	52
68 1,1,2,2-Tetrachloroethane	83.00	19.550	19.550	(1.095)	113933	45	49
* 69 1,4-Dichlorobenzene-d4	152.00	21.550	21.550	(1.000)	64998	50	
$ 91 Dibromofluoromethane	113.00	12.283	12.283	(1.015)	83048	52	57
$ 92 1,2-Dichloroethane-d4	65.00	12.983	12.983	(0.961)	52602	51	56
$ 93 Toluene-d8	98.00	15.650	15.650	(0.877)	164519	52	57
$ 94 Bromofluorobenzene	174.00	19.683	19.683	(1.103)	69813	47	52

QC Flag Legend

R - Spike/Surrogate failed recovery limits.

GC/MS SEMIVOLATILE ORGANICS

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

QAL Lab Reference No./SDG. MB382

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All original times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: SW-846 (3510A - water & 3550A - soil)
Cleanup: N/A
Analysis: SW-846 8270A

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: As requested, the matrix spikes were performed using a sample from sample delivery group MB382 (MB382001MS and MB382001MSD). The absolute recovery for 4-Nitrophenol was above advisory QC criteria in the matrix spike. All other advisory acceptance criteria were met. A copy of the results is provided for your review.

E. Samples: Sample analysis proceeded normally.

F. Other: Please note that the Form 1's reflect the specified target list and that Azobenzene is reported as 1,2-Diphenylhydrazine.

A summary of the most current applicable method detection limits (MDLs) immediately follows the case narrative.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Debra A. Vergin DATE: 8/7/96
Chemist

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH[1]
MB382001	323-068	SOIL	07/12/96	07/17/96	07/31/96	N/A
MB382001MS	323-068MS	SOIL	07/12/96	07/17/96	07/31/96	N/A
MB382001MSD	323-068MSD	SOIL	07/12/96	07/17/96	07/31/96	N/A
MB382002	323-06B	WATER	07/12/96	07/17/96	07/30/96	N/A
S07176B1	SBLK8E	SOIL	N/A	07/17/96	07/30/96	N/A
W07176B1	SBLK8D	WATER	N/A	07/17/96	07/30/96	N/A

[1] Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8270 Extraction Method: SW3510

	MDL ug/L
Acenaphthene	1.24
Acenaphthylene	1.26
Acetophenone	1.39
2-Acetylaminofluorene	1.01
4-Aminobiphenyl	1.11
Aniline	1.29
Anthracene	1.00
Aramite	1.24
Aramite(DUP)	0.88
Benzidine	2.20
Benzo(a)anthracene	0.98
Benzo(a)pyrene	1.06
Benzo(b)fluoranthene	1.09
Benzo(g,h,i)perylene	0.95
Benzo(k)fluoranthene	1.72
Benzoic acid	9.07
Benzyl alcohol	1.28
bis(2-Chloroethoxy)methane	1.38
bis(2-Chloroethyl)ether	1.26
bis(2-Ethylhexyl)phthalate	1.50
4-Bromophenyl-phenylether	0.92
Butylbenzylphthalate	1.34
Carbazole	1.20
4-Chloro-3-Methylphenol	0.93
4-Chloroaniline	0.96
1-Chloronaphthalene	1.34
2-Chloronaphthalene	1.35
2-Chlorophenol	1.17
4-Chlorophenyl-phenylether	1.10
Chrysene	0.91
Di-n-butylphthalate	2.52
Di-n-octylphthalate	2.19
Dibenz(a,h)anthracene	0.71
Dibenzofuran	1.20
1,2-Dichlorobenzene	1.29
1,3-Dichlorobenzene	1.45
1,4-Dichlorobenzene	1.33
3,3'-Dichlorobenzidine	2.43
2,4-Dichlorophenol	0.86
2,6-Dichlorophenol	1.09
Diethylphthalate	1.38
7,12-Dimethylbenz(a)anthracen	1.11
3,3'-Dimethylbenzidine	4.16

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8270 Extraction Method: SW3510

	MDL ug/L
2,4-Dimethylphenol	1.17
Dimethylphthalate	1.22
4,6-Dinitro-2-methylphenol	0.79
1,3-Dinitrobenzene	1.59
2,4-Dinitrophenol	2.07
2,4-Dinitrotoluene	1.08
2,6-Dinitrotoluene	1.14
1,2-Diphenylhydrazine	1.04
Ethyl methanesulfonate	1.03
Fluoranthene	1.39
Fluorene	1.20
Hexachlorobenzene	0.61
Hexachlorobutadiene	1.72
Hexachlorocyclopentadiene	3.15
Hexachloroethane	1.54
Hexachlorophene	36.10
Hexachloropropene	2.69
Indeno(1,2,3-cd)pyrene	0.71
Isophorone	1.52
Isosafrole	1.31
Methapyrilene	5.73
Methyl methanesulfonate	1.08
3-Methylcholanthrene	0.79
2-Methylnaphthalene	1.25
2-Methylphenol	1.08
3 & 4-Methylphenol	2.22
N-Nitroso-di-n-butylamine	1.28
N-Nitroso-di-n-propylamine	1.53
N-Nitrosodiethylamine	1.55
N-Nitrosodimethylamine	0.88
N-Nitrosodiphenylamine (1)	2.00
N-Nitrosomethylethylamine	1.43
N-Nitrosomorpholine	1.18
N-Nitrosopiperidine	1.33
N-Nitrosopyrrolidine	1.33
Naphthalene	1.36
1,4-Naphthoquinone	168.18
1-Naphthylamine	1.20
2-Naphthylamine	0.97
5-Nitro-o-toluidine	1.01
2-Nitroaniline	1.91
3-Nitroaniline	1.94
4-Nitroaniline	2.24

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER

Analytical Method: SW8270 Extraction Method: SW3510

	MDL ug/L
Nitrobenzene	1.64
2-Nitrophenol	0.90
4-Nitrophenol	1.03
4-Nitroquinoline-1-oxide	1.04
o-Toluidine	1.20
2,2'-Oxybis(1-chloropropane)	1.39
p-Dimethylaminoazobenzene	1.12
Pentachlorobenzene	1.19
Pentachloronitrobenzene	0.88
Pentachlorophenol	1.93
Phenacetin	1.45
Phenanthrene	0.97
Phenol	0.68
Phenyl-tert-butylamine	15.68
1,4-Phenylenediamine	2.02
2-Picoline	1.71
Pronamide	1.08
Pyrene	1.26
Pyridine	0.79
Safrole	1.17
1,2,4,5-Tetrachlorobenzene	1.33
2,3,4,6-Tetrachlorophenol	1.04
1,2,4-Trichlorobenzene	1.34
2,4,5-Trichlorophenol	0.94
2,4,6-Trichlorophenol	0.81
1,3,5-Trinitrobenzene	0.35

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: SOIL
Analytical Method: SW8270 Extraction Method: SW3550

	MDL ug/Kg
Acenaphthene	11.54
Acenaphthylene	11.10
Acetophenone	18.09
2-Acetylaminofluorene	27.44
4-Aminobiphenyl	28.93
Aniline	125.52
Anthracene	13.33
Aramite	27.55
Aramite(DUP)	25.74
Benzidine	254.94
Benzo(a)anthracene	18.30
Benzo(a)pyrene	16.77
Benzo(b)fluoranthene	42.01
Benzo(g,h,i)perylene	14.71
Benzo(k)fluoranthene	37.14
Benzoic acid	670.18
Benzyl alcohol	50.30
bis(2-Chloroethoxy)methane	9.40
bis(2-Chloroethyl)ether	9.20
bis(2-Ethylhexyl)phthalate	16.87
4-Bromophenyl-phenylether	16.62
Butylbenzylphthalate	16.72
Carbazole	15.34
4-Chloro-3-Methylphenol	55.91
4-Chloroaniline	136.56
1-Chloronaphthalene	20.02
2-Chloronaphthalene	8.78
2-Chlorophenol	16.00
4-Chlorophenyl-phenylether	11.48
Chrysene	16.73
Di-n-butylphthalate	19.58
Di-n-octylphthalate	12.57
Dibenz(a,h)anthracene	12.29
Dibenzofuran	26.85
1,2-Dichlorobenzene	9.72
1,3-Dichlorobenzene	7.64
1,4-Dichlorobenzene	7.36
3,3'-Dichlorobenzidine	16.37
2,4-Dichlorophenol	22.18
2,6-Dichlorophenol	17.82
Diethylphthalate	20.88
7,12-Dimethylbenz(a)anthracen	26.39
3,3'-Dimethylbenzidine	325.07

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: SOIL

Analytical Method: SW8270 Extraction Method: SW3550

	MDL ug/Kg
2,4-Dimethylphenol	17.63
Dimethylphthalate	17.95
4,6-Dinitro-2-methylphenol	185.69
1,3-Dinitrobenzene	38.83
2,4-Dinitrophenol	407.96
2,4-Dinitrotoluene	17.06
2,6-Dinitrotoluene	16.67
1,2-Diphenylhydrazine	24.41
Ethyl methanesulfonate	14.02
Fluoranthene	14.14
Fluorene	13.51
Hexachlorobenzene	42.70
Hexachlorobutadiene	10.22
Hexachlorocyclopentadiene	40.61
Hexachloroethane	8.12
Hexachlorophene	2094.89
Hexachloropropene	17.60
Indeno(1,2,3-cd)pyrene	12.29
Isophorone	10.24
Isosafrole	9.23
Methapyrilene	1483.74
Methyl methanesulfonate	15.47
3-Methylcholanthrene	15.47
2-Methylnaphthalene	30.24
2-Methylphenol	31.92
3 & 4-Methylphenol	92.42
N-Nitroso-di-n-butylamine	21.83
N-Nitroso-di-n-propylamine	21.99
N-Nitrosodiethylamine	9.20
N-Nitrosodimethylamine	20.24
N-Nitrosodiphenylamine (1)	38.62
N-Nitrosomethylethylamine	22.84
N-Nitrosomorpholine	18.28
N-Nitrosopiperidine	8.20
N-Nitrosopyrrolidine	48.51
Naphthalene	8.84
1,4-Naphthoquinone	305.19
1-Naphthylamine	39.92
2-Naphthylamine	15.07
5-Nitro-o-toluidine	25.83
2-Nitroaniline	86.70
3-Nitroaniline	104.07
4-Nitroaniline	106.97

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: SOIL

Analytical Method: SW8270 Extraction Method: SW3550

	MDL ug/Kg
Nitrobenzene	9.33
2-Nitrophenol	9.68
4-Nitrophenol	78.21
4-Nitroquinoline-1-oxide	44.78
o-Toluidine	61.47
2,2'-Oxybis(1-chloropropane)	13.68
p-Dimethylaminoazobenzene	21.99
Pentachlorobenzene	12.44
Pentachloronitrobenzene	13.90
Pentachlorophenol	24.53
Phenacetin	32.75
Phenanthrene	12.27
Phenol	28.44
Phenyl-tert-butylamine	37.72
1,4-Phenylenediamine	12378.16
2-Picoline	55.59
Pronamide	27.74
Pyrene	16.32
Pyridine	123.29
Safrole	10.42
1,2,4,5-Tetrachlorobenzene	18.12
2,3,4,6-Tetrachlorophenol	23.83
1,2,4-Trichlorobenzene	6.54
2,4,5-Trichlorophenol	40.40
2,4,6-Trichlorophenol	12.76
1,3,5-Trinitrobenzene	17.04

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006777.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/31/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
62-75-9	N-Nitrosodimethylamine	370	U
108-95-2	Phenol	370	U
111-44-4	bis(2-Chloroethyl)ether	370	U
95-57-8	2-Chlorophenol	370	U
541-73-1	1,3-Dichlorobenzene	370	U
106-46-7	1,4-Dichlorobenzene	370	U
95-50-1	1,2-Dichlorobenzene	370	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	370	U
621-64-7	N-Nitroso-di-n-propylamine	370	U
67-72-1	Hexachloroethane	370	U
98-95-3	Nitrobenzene	370	U
78-59-1	Isophorone	370	U
88-75-5	2-Nitrophenol	370	U
105-67-9	2,4-Dimethylphenol	370	U
111-91-1	bis(2-Chloroethoxy)methane	370	U
120-83-2	2,4-Dichlorophenol	370	U
120-82-1	1,2,4-Trichlorobenzene	370	U
91-20-3	Naphthalene	370	U
87-68-3	Hexachlorobutadiene	370	U
59-50-7	4-Chloro-3-methylphenol	370	U
88-06-2	2,4,6-Trichlorophenol	370	U
91-58-7	2-Chloronaphthalene	370	U
131-11-3	Dimethylphthalate	370	U
606-20-2	2,6-Dinitrotoluene	370	U
208-96-8	Acenaphthylene	370	U
83-32-9	Acenaphthene	370	U
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	1800	U
121-14-2	2,4-Dinitrotoluene	370	U
84-66-2	Diethylphthalate	370	U
86-73-7	Fluorene	370	U
7005-72-3	4-Chlorophenyl-phenylether	370	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006777.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/31/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
534-52-1	4,6-Dinitro-2-methylphenol	1800	U
86-30-6	N-Nitrosodiphenylamine (3)	370	U
122-66-7	1,2-Diphenylhydrazine	370	U
101-55-3	4-Bromophenyl-phenylether	370	U
118-74-1	Hexachlorobenzene	370	U
87-86-5	Pentachlorophenol	1800	U
85-01-8	Phenanthrene	370	U
120-12-7	Anthracene	370	U
84-74-2	Di-n-butylphthalate	370	U
206-44-0	Fluoranthene	370	U
92-87-5	Benzidine	1800	U
129-00-0	Pyrene	370	U
85-68-7	Butylbenzylphthalate	370	U
56-55-3	Benzo(a)anthracene	370	U
91-94-1	3,3'-Dichlorobenzidine	730	U
218-01-9	Chrysene	370	U
117-81-7	bis(2-Ethylhexyl)phthalate	66	J
117-84-0	Di-n-octylphthalate	370	U
205-99-2	Benzo(b)fluoranthene	370	U
207-08-9	Benzo(k)fluoranthene	370	U
50-32-8	Benzo(a)pyrene	370	U
193-39-5	Indeno(1,2,3-cd)pyrene	370	U
53-70-3	Dibenz(a,h)anthracene	370	U
191-24-2	Benzo(g,h,i)perylene	370	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846 MTP

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006777.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/31/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 18

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	Propylene Glycol	4.135	660	NJ
2. 68-12-2	Formamide, N,N-dimethyl-	4.560	530	NJ
3. 141-79-7	3-Penten-2-one, 4-methyl-	4.714	500	NJA
4.	Unknown	4.898	1200	J
5. 2216-30-0	Heptane, 2,5-dimethyl-	5.022	160	NJ
6. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.154	44000	NJA
7.	Heptane, Dimethyl- isomer	5.213	500	NJ
8.	Unknown Alkane	5.264	750	J
9. 2216-33-3	Octane, 3-methyl-	5.323	590	NJ
10. 108-94-1	Cyclohexanone	5.623	130	NJ
11.	Unknown	5.740	700	J
12.	Unknown	5.843	820	J
13. 4436-75-3	3-Hexene-2,5-dione	5.960	990	NJ
14.	Unknown	6.143	140	J
15.	Unknown	6.297	1200	J
16.	Unknown	6.510	190	J
17. 123-19-3	4-Heptanone	6.751	520	NJ
18.	Unknown Hydrocarbon	21.070	110	J
19.				
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28.				
29.				
30.				

MTP/8r

FORM I SV-TIC SW846

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h073096.b/h0006777.d
Lab Smp Id: MB382001 Client Smp ID: 323-068
Inj Date : 31-JUL-1996 00:26
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB382001 323-068
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 31-Jul-1996 17:42 mjohnson Quant Type: ISTD
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 13
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/Kg)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.389	5.384	(0.812)	152846	170	2800(A)
$	9 Phenol-d5	99.00	6.195	6.190	(0.934)	181630	160	2700(A)
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.634	6.637	(1.000)	22869	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.338	7.340	(0.877)	79561	86	1400
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.371	8.374	(1.000)	83584	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.283	10.294	(0.874)	110745	87	1400
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

Rev mrp 8/
MEJ 8/

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/Kg)
65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
66 Acenaphthylene	152.00	Compound Not Detected.					
* 68 Acenaphthene-d10	164.00	11.764	11.766	(1.000)	41764	40	
69 Acenaphthene	154.00	Compound Not Detected.					
70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
71 4-Nitrophenol	65.00	Compound Not Detected.					
74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
78 Diethylphthalate	149.00	Compound Not Detected.					
79 Fluorene	166.00	Compound Not Detected.					
80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$ 86 2,4,6-Tribromophenol	329.65	13.566	13.562	(1.153)	42213	180	3000(A)
89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
90 Hexachlorobenzene	284.00	Compound Not Detected.					
92 Pentachlorophenol	266.00	Compound Not Detected.					
* 95 Phenanthrene-d10	188.00	15.156	15.166	(1.000)	66793	40	
96 Phenanthrene	178.00	Compound Not Detected.					
97 Anthracene	178.00	Compound Not Detected.					
99 Di-n-butylphthalate	149.00	Compound Not Detected.					
102 Fluoranthene	202.00	Compound Not Detected.					
103 Benzidine	184.00	Compound Not Detected.					
104 Pyrene	202.00	Compound Not Detected.					
$ 106 Terphenyl-d14	244.00	19.025	19.021	(0.879)	131113	120	2000
110 Butylbenzylphthalate	149.00	Compound Not Detected.					
112 Benzo(a)anthracene	228.00	Compound Not Detected.					
113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
* 114 Chrysene-d12	240.00	21.649	21.659	(1.000)	49712	40	
115 Chrysene	228.00	Compound Not Detected.					
116 bis(2-Ethylhexyl)phthalate	149.00	21.634	21.637	(0.999)	6477	4	60(a)
117 Di-n-octylphthalate	149.00	Compound Not Detected.					
118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
122 Benzo(a)pyrene	252.00	Compound Not Detected.					
* 123 Perylene-d12	264.00	25.085	25.095	(1.000)	38481	40	
125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
Q - Qualifier signal failed the ratio test.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-06B

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) WATER Lab Sample ID: MB382002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006776.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

MTP/8

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-06B

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) WATER Lab Sample ID: MB382002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006776.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (3)	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
92-87-5	Benzidine	50	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

MTP/8r

FORM I SV-2

SW846

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-06B

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) WATER Lab Sample ID: MB382002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006776.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 8

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.088	3	NJAB
2.	Unknown	5.623	3	J
3. 150-76-5	Mequinol	7.286	6	NJ
4. 13679-75-9	1-(2-Thienyl)-1-propanone	8.275	4	NJ
5. 95-16-9	Benzothiazole	8.832	2	NJ
6. 121-33-5	Vanillin	10.606	2	NJ
7. 10546-70-0	Benzamide, N-propyl-	12.350	4	NJ
8.	Unknown Hydrocarbon	23.363	15	J
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29.				
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MTP/8r

FORM I SV-TIC SW846

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h073096.b/h0006776.d
Lab Smp Id: MB382002 Client Smp ID: 323-06B
Inj Date : 30-JUL-1996 23:47
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB382002 323-06B
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 31-Jul-1996 17:42 mjohnson Quant Type: ISTD
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 12
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.381	5.384	(0.811)	82795	110	57
$	9 Phenol-d5	99.00	6.187	6.190	(0.933)	71197	80	40
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.634	6.637	(1.000)	18174	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.338	7.340	(0.877)	60657	67	34
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.371	8.374	(1.000)	81960	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.291	10.294	(0.875)	82360	61	31
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

Rev-MMP 8/1/96
MEJ 8/1/96

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
	66 Acenaphthylene	152.00	Compound Not Detected.					
*	68 Acenaphthene-d10	164.00	11.763	11.766	(1.000)	44137	40	
	69 Acenaphthene	154.00	Compound Not Detected.					
	70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
	71 4-Nitrophenol	65.00	Compound Not Detected.					
	74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
	78 Diethylphthalate	149.00	Compound Not Detected.					
	79 Fluorene	166.00	Compound Not Detected.					
	80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
	83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
	84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
	85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$	86 2,4,6-Tribromophenol	329.65	13.559	13.562	(1.153)	33759	140	68
	89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
	90 Hexachlorobenzene	284.00	Compound Not Detected.					
	92 Pentachlorophenol	266.00	Compound Not Detected.					
*	95 Phenanthrene-d10	188.00	15.156	15.166	(1.000)	67038	40	
	96 Phenanthrene	178.00	Compound Not Detected.					
	97 Anthracene	178.00	Compound Not Detected.					
	99 Di-n-butylphthalate	149.00	Compound Not Detected.					
	102 Fluoranthene	202.00	Compound Not Detected.					
	103 Benzidine	184.00	Compound Not Detected.					
	104 Pyrene	202.00	Compound Not Detected.					
$	106 Terphenyl-d14	244.00	19.018	19.021	(0.878)	138519	98	49
	110 Butylbenzylphthalate	149.00	Compound Not Detected.					
	112 Benzo(a)anthracene	228.00	Compound Not Detected.					
	113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
*	114 Chrysene-d12	240.00	21.648	21.659	(1.000)	63690	40	
	115 Chrysene	228.00	Compound Not Detected.					
	116 bis(2-Ethylhexyl)phthalate	149.00	Compound Not Detected.					
	117 Di-n-octylphthalate	149.00	Compound Not Detected.					
	118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
	120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
	122 Benzo(a)pyrene	252.00	Compound Not Detected.					
*	123 Perylene-d12	264.00	25.085	25.095	(1.000)	63588	40	
	125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
	126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
	127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h073096.b/h0006776.d
Lab Smp Id: MB382002 Client Smp ID: 323-06B
Inj Date : 30-JUL-1996 23:47
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB382002 323-06B
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 31-Jul-1996 17:42 mjohnson
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 12
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
* 16 1,4-Dichlorobenzene-d4	6.634	149271	40.000
* 42 Naphthalene-d8	8.371	209935	40.000
* 68 Acenaphthene-d10	11.763	219742	40.000
* 114 Chrysene-d12	21.648	228575	40.000

		CONCENTRATIONS			QUANT		
RT	AREA	ON-COL(NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	CPND #
2-Pentanone, 4-hydroxy-4-methyl-				CAS #: 123-42-2			
5.088	19693	5	3	40	NBS75K.l	64274	16
Unknown Alcohol				CAS #:			
5.623	24108	6	3	0		0	16
Mequinol				CAS #: 150-76-5			
7.286	46162	12	6	90	NBS75K.l	64775	16
1-(2-Thienyl)-1-propanone				CAS #: 13679-75-9			
8.275	42470	8	4	91	NBS75K.l	7304	42

RT	AREA	CONCENTRATIONS ON-COL(NG)	FINAL(ug/L)	QUAL	QUANT LIBRARY	LIB ENTRY	CPND #
Benzothiazole					CAS #: 95-16-9		
8.832	24106	4	2	93	NBS75K.l	65591	42
Vanillin					CAS #: 121-33-5		
10.606	22046	4	2	97	NBS75K.l	66915	68
Benzamide, N-propyl-					CAS #: 10546-70-0		
12.350	40891	7	4	80	NBS75K.l	13165	68
Unknown					CAS #:		
23.363	173695	30	15	0		0	114

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK8D

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) WATER Lab Sample ID: W07176B1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006768.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (3)	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
92-87-5	Benzidine	50	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK8D

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) WATER Lab Sample ID: W07176B1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006768.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK8D

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) WATER Lab Sample ID: W07176B1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006768.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.096	3	NJA
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h073096.b/h0006768.d
Lab Smp Id: W07176B1 Client Smp ID: SBLK8D
Inj Date : 30-JUL-1996 18:36
Operator : mjohnson Inst ID: ms3.i
Smp Info : W07176B1 SBLK8D
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 31-Jul-1996 17:42 mjohnson Quant Type: ISTD
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 4 QC Sample: BLANK
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.381	5.384	(0.811)	145027	110	56
$	9 Phenol-d5	99.00	6.188	6.190	(0.933)	129949	82	41
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.635	6.637	(1.000)	32120	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.338	7.340	(0.876)	105820	80	40
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.379	8.374	(1.000)	120421	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.291	10.294	(0.874)	154247	82	41
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

per MP 8/1
MRD 8/

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
66 Acenaphthylene	152.00	Compound Not Detected.					
* 68 Acenaphthene-d10	164.00	11.771	11.766	(1.000)	61893	40	
69 Acenaphthene	154.00	Compound Not Detected.					
70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
71 4-Nitrophenol	65.00	Compound Not Detected.					
74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
78 Diethylphthalate	149.00	Compound Not Detected.					
79 Fluorene	166.00	Compound Not Detected.					
80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$ 86 2,4,6-Tribromophenol	329.65	13.567	13.562	(1.153)	54939	160	79
89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
90 Hexachlorobenzene	284.00	Compound Not Detected.					
92 Pentachlorophenol	266.00	Compound Not Detected.					
* 95 Phenanthrene-d10	188.00	15.157	15.166	(1.000)	92504	40	
96 Phenanthrene	178.00	Compound Not Detected.					
97 Anthracene	178.00	Compound Not Detected.					
99 Di-n-butylphthalate	149.00	Compound Not Detected.					
102 Fluoranthene	202.00	Compound Not Detected.					
103 Benzidine	184.00	Compound Not Detected.					
104 Pyrene	202.00	Compound Not Detected.					
$ 106 Terphenyl-d14	244.00	19.026	19.021	(0.879)	185437	98	49
110 Butylbenzylphthalate	149.00	Compound Not Detected.					
112 Benzo(a)anthracene	228.00	Compound Not Detected.					
113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
* 114 Chrysene-d12	240.00	21.656	21.659	(1.000)	85632	40	
115 Chrysene	228.00	Compound Not Detected.					
116 bis(2-Ethylhexyl)phthalate	149.00	Compound Not Detected.					
117 Di-n-octylphthalate	149.00	Compound Not Detected.					
118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
122 Benzo(a)pyrene	252.00	Compound Not Detected.					
* 123 Perylene-d12	264.00	25.093	25.095	(1.000)	93126	40	
125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

Report of Analytical Results

Client Sample ID: 323-068D
Sample Description: COMP
Sample Matrix: Soil

Date Collected: 07/12/96 (Friday)
Date Received: 07/16/96 (Tuesday)

Lab Reference No: MB382
Lab Sample ID: MB382001D

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC					
Total Petroleum Hydrocarbons	4.2	rpd	NA	07/23/96	S3550/9071/418.1

(6486)

Report of Analytical Results

Client Sample ID: 323-068S
Sample Description: COMP
Sample Matrix: Soil

Date Collected: 07/12/96 (Friday)
Date Received: 07/16/96 (Tuesday)

Lab Reference No: MB382
Lab Sample ID: MB382001S

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC					
Total Petroleum Hydrocarbons	65.0	%rec	NA	07/23/96	S3550/9071/418.1

(6486)

Initial and Continuing Calibration Verification
GENERAL CHEMISTRY

Lab Reference No./SDG: MB382

Analytical Parameter	Conc. Units	INITIAL CALIBRATION			CONTINUING CALIBRATION					
		True	Found	% Rec.	True	Found	% Rec.	True	Found	% Rec.
Total Petroleum Hydrocarbons	mg/Kg	3.000	3.007	100.2	3.000	2.976	99.2	3.000	2.970	99.0

Comments: Control Limits are 90-110% (except where noted).

Blanks
GENERAL CHEMISTRY

Lab Reference No./SDG: MB382

Method Blank matrix: Soil

Analytical Parameter	Initial Cal. Blank	Continuing Cal. Blank 1	Continuing Cal. Blank 2	Method Blank	Conc. Units
Total Petroleum Hydrocarbons	<0.05	<0.05	<0.05	<1.6	mg/Kg

COMMENTS:

Matrix Spike Sample Recovery
GENERAL CHEMISTRY

Lab Reference No./SDG: M8382

Sample matrix: Soil
% Solids (if soil):

Lab Sample ID:
Client Sample ID:

Analytical Parameter	Control Limit % Rec	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	% Rec.	Conc. Units
Total Petroleum Hydrocarbons	80-120	71.100	22.0	75.54	65.0	mg/Kg

COMMENTS:

Post Spike Sample Recovery
GENERAL CHEMISTRY

Lab Reference No./SDG: MB382

Sample matrix: Soil
% Solids (if soil):

Lab Sample ID: MB382001PS
Client Sample ID: 323-068PS

Analytical Parameter	Control Limit % Rec	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	% Rec.	Conc. Units
Total Petroleum Hydrocarbons	80-120	100.352	22.0	75.54	103.7	mg/Kg

COMMENTS:

Duplicates
GENERAL CHEMISTRY

Lab Reference No./SDG: MB382

Sample matrix: Soil
% Solids (if soil):

Lab Sample ID: MB382001D
Client Sample ID: 323-068D

Analytical Parameter	Control Limit	Sample (S)	Duplicate (D)	RPD	Conc. Units
Total Petroleum Hydrocarbons	20	22.0	21.129	4.2	mg/Kg

COMMENTS:

Laboratory Control Sample
GENERAL CHEMISTRY

Lab Reference No./SDG: MB382

Analytical Parameter	Conc. Units	True	Found	% Rec	True	Found	% Rec	Limits
Total Petroleum Hydrocarbons	mg/Kg	68.460	66.406	97.0				85-111

COMMENTS:

Sample Receipt Exceptions Report

Batch Number: MB 382 Origination date: 7/16/96

Client/Project: Brown & Root

SUMMARY OF EXCEPTION (check one if it applies)

√	Description of exception	Comments (write number of exception description and the impacted sample numbers)
	1. No custody seal as required by the project.	Container labels for MS/MSD were not filled out with sample ID's, analysis, dates or times.
	2. No chain-of-custody provided.	
√	3. Chain-of-custody provided but incomplete.	
	4. Samples broken or leaking on receipt.	
	5. Temperature of samples inappropriate for analysis requested.	No Analyses indicated for rinsate blank
	6. Container inappropriate for analysis requested.	
	7. Inadequate sample volume for analysis requested.	
	8. Preservation inappropriate for analysis requested.	
	9. Samples received out of holding time for analysis requested.	
√	10. Samples received more than 72 hours after sampling.	
√	11. Discrepancies between chain-of-custody and container labels.	
	12. Other (describe on right)	

FRACTION(S) AFFECTED (specify which fraction was affected by the exceptions detailed above by writing the number of the exception next to it)

Unpreserved		Nutrients		Metals		Volatiles	
Cyanide		Extractables		Extractables		Other (specify)	

ACTION TAKEN:

Originator: Paul Hernandez Supervisor: [illegible]

Client was notified on: (DATE/TIME) 7/16 Client contact: Jerry Goodw

Client's comments: Add MS/MSD for 323-SS-SB14-068

Split 2L blank container for 8 RCRA metals & SVOC (8270) - preserve accordingly

Client Services: [illegible] QA officer:

QAL Montgomery

RECT_CAR.DOC (3/1

Brown & Root Environmental
455 FAIRWAY DRIVE, SUITE 200
DEERFIELD BEACH, FLORIDA 33441
(305) 570-5885 (305) 570-5974 (FAX)

SITE MANAGER: G. Goode
PROJECT NAME: CTO 0008
BRE PROJECT NO.: 7113 CODE:
P.O. NO.: 2049-7113-P16349

SHIPPED TO: Quality Analytical LAB
Montgomery, ALA
(LABORATORY NAME, CITY)

PAGE 1 OF 1

CHAIN OF CUSTODY RECORD

LABORATORY ANALYSIS

SAMPLED BY (PRINT): C. Burgin
SAMPLER SIGNATURE:

☑ STANDARD TAT ☐ RUSH
☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS
RESULTS DUE DATE:

LAB NO.	DATE 96	TIME	SAMPLE IDENTIFICATION	SAMPLE TYPE COMP.	SAMPLE TYPE GRAB	MATRIX	PARAMETERS / PRES. TYPE: RCRA Metals N/A	TCLP metals N/A	8240 Priority Pollutants N/A	8270 N/A	TPH N/A					NUMBER OF CONTAINERS	COMMENTS:	
	7-12	1732	323-SS-SB14-068	/		soil	1	1	1	1	1					5	samples ICED	01
	7-12	1725	323-SS-SB14-06B			AFW						1				1	Extra volume Added For MS & MSD from SB14	02
																	Received samples 7/15/96 prior to shipment.	
			TOTAL NUMBER OF CONTAINERS				1	1	1	1	1					6		

FOR LAB USE ONLY
LAB # MB382
LBOL #
ACK VERIFIED
HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC DS ICP
ANALYZED TEMP
CUST SEAL PH
SAMPLE COND.

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)	SEAL INTACT?	DATE / TIME	EMPTY BOTTLES RECEIVED BY (SIGNATURE)	SEAL INTACT?	DATE / TIME
① Michael D. Shine	YES NO N/A	DATE: 6/25/96 TIME: 3:45 pm	②	YES NO N/A	DATE: 7-10-96 TIME: 1200
RELINQUISHED BY (SIGNATURE) ③	YES NO N/A	DATE: 7-12-96 TIME: 2140	RECEIVED BY (SIGNATURE) ④	YES NO N/A	DATE: 7/15/96 TIME: 8:[illegible]
RELINQUISHED BY (SIGNATURE) ⑤	YES NO N/A	DATE: 7/15/96 TIME: 8:15	RECEIVED BY (SIGNATURE) ⑥ Fed Ex	YES NO N/A	DATE: TIME:

SPECIAL INSTRUCTIONS:

LABORATORY REMARKS:

SAMPLE CONTAINERS PRECLEANED BY: ☐ BRE ☐ LABORATORY ☑ MANUFACTURER

METHOD OF SHIPMENT: Fed Ex

BILL OF LADING NO.: 6687475491

WHITE-FULLY EXECUTED COPY
YELLOW-RECEIVING LABORATORY COPY
PINK-SAMPLERS' COPY/QA COPY

SAMPLING TEAM: C. Burgin

RECEIVED FOR LABORATORY BY (SIGNATURE): Paul Hernandez

No. 0287

U78UUU

APPENDIX J

GROUNDWATER FIELD SCREENING RESULTS

Job "7113BTEX" (Standard A,) 06/12/96 09:54:11

Detector "A" ( )		Attenuation -	1	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	0	Baseline -	0	Units -	PPM
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm

Detector "B" (PID)		Attenuation -	10	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	10	Baseline -	435	Units -	PPB
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
1	*** unknown ***		995	230570	1:17	
2	BENZENE	65.278	18847	2776070	1:40	
3	TOLUENE	100.000	23272	4290270	2:26	
4	ETHYLBENZENE	100.000	17408	2849640	3:54	
5	M,P-XYLENES	100.000	47235	11732860	4:05	
6	O-XYLENES	100.000	17802	4807930	4:39	

End of Result Report

Job "7113BTEX" (Standard B,) 06/12/96 10:08:51

Detector "A" ( )
Segment Width - 10
Noise - 0
Detector Temp - 110 C

Attenuation - 1
Range - 1
Baseline - 0
Oven Temp - 70 C

Min Area - 0
Autorange - 1
Units - PPM

Peak	Component Name	Concentration	Height	Area	Time	Alarm

Detector "B" (PID)
Segment Width - 10
Noise - 7
Detector Temp - 110 C

Attenuation - 10
Range - 1
Baseline - 444
Oven Temp - 70 C

Min Area - 0
Autorange - 1
Units - PPB

Peak	Component Name	Concentration	Height	Area	Time	Alarm
1	*** unknown ***		199	8960	1:02	
2	*** unknown ***		684	223150	1:14	
3	BENZENE	17.168	2702	403500	1:41	
4	TOLUENE	23.591	6326	1070260	2:27	
5	ETHYLBENZENE	17.729	2691	411150	3:54	
6	M,P-XYLENES	18.681	8201	2074860	4:06	
7	O-XYLENES	17.749	2759	686380	4:39	

End of Result Report

Job "7113BTEX" (Standard C,) 06/12/96 10:22:40

Detector "A" ( )		Attenuation -	1	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	0	Baseline -	0	Units -	PPM
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm

Detector "B" (PID)		Attenuation -	10	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	4	Baseline -	432	Units -	PPB
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
1	*** unknown ***		734	192970	1:12	
2	BENZENE	6.182	1066	147720	1:38	
3	TOLUENE	12.116	4203	660110	2:23	
4	ETHYLBENZENE	3.852	766	109720	3:48	
5	M,P-XYLENES	5.961	2617	606770	3:59	
6	O-XYLENES	5.046	788	178930	4:31	

End of Result Report

Job "7113BTEX" (323-GW-TW01-001) 06/14/96 21:26:29

Detector "A" ( )
Segment Width - 10
Noise - 0
Detector Temp - 110 C

Attenuation - 1
Range - 1
Baseline - 0
Oven Temp - 70 C

Min Area - 0
Autorange - 1
Units - PPM

Peak	Component Name	Concentration	Height	Area	Time	Alarm

Detector "B" (PID)
Segment Width - 10
Noise - 6
Detector Temp - 110 C

Attenuation - 10
Range - 1
Baseline - 460
Oven Temp - 70 C

Min Area - 0
Autorange - 1
Units - PPB

Peak	Component Name	Concentration	Height	Area	Time	Alarm
1	*** unknown ***		513	115970	1:11	
2	TOLUENE	0.588	204	48700	2:25	
3	*** unknown ***		453	126810	2:40	
4	*** unknown ***		550	219170	2:56	
5	*** unknown ***		3758	1188150	3:31	
6	ETHYLBENZENE	14.589	2901	786300	3:49	
7	*** unknown ***		2810	687130	4:21	
8	O-XYLENES	37.187	5807	2832710	4:40	
9	*** unknown ***		8260	4086040	5:14	
10	*** unknown ***		7666	2678710	5:46	
11	*** unknown ***		11164	4054240	6:04	
12	*** unknown ***		19134	15737230	6:34	
13	*** unknown ***		21008	13008790	7:12	
14	*** unknown ***		19473	11705210	8:02	
15	*** unknown ***		20277	17702150	8:40	
16	*** unknown ***		18439	7252590	9:16	
17	*** unknown ***		18416	3812120	9:34	
18	*** unknown ***		18407	2021280	9:37	

End of Result Report

Job "7113BTEX" (323-GW-TW02-001) 06/14/96 21:49:02

Detector "A" ( )
Segment Width - 10
Noise - 0
Detector Temp - 110 C

Attenuation - 1
Range - 1
Baseline - 0
Oven Temp - 70 C

Min Area - 0
Autorange - 1
Units - PPM

Peak	Component Name	Concentration	Height	Area	Time	Alarm

Detector "B" (PID)
Segment Width - 10
Noise - 11
Detector Temp - 110 C

Attenuation - 10
Range - 1
Baseline - 758
Oven Temp - 70 C

Min Area - 0
Autorange - 1
Units - PPB

Peak	Component Name	Concentration	Height	Area	Time	Alarm
1	*** unknown ***		1213	140640	0:13	
2	*** unknown ***		1722	200650	0:20	
3	*** unknown ***		1771	229080	0:24	
4	*** unknown ***		907	91790	1:33	
5	BENZENE	12.034	2075	328910	1:43	
6	*** unknown ***		2735	257810	1:47	
7	*** unknown ***		3136	769120	1:54	
8	TOLUENE	2.081	722	57060	2:22	
9	TOLUENE	1.165	404	30110	2:26	

End of Result Report

~~STANDARDS~~	
Date Prepared	6 / 14 / 96

323-GW-TW03-001

Retention Times					
Concentration	Benzene	Toluene	Ethyl Ben	m,p- Xylenes	o- Xylenes
5					
20					

Concentration	Compound	Time	Area	Concentration/Area	Average Concentration/Area
~~5~~	Benzene				
~~20~~					
~~5~~	Toluene				
~~20~~					
~~5~~	Ethyl Benzene				
~~20~~					
~~5~~	m,p -Xylene				
~~20~~					
~~5~~	o- Xylene				
~~20~~					

APPENDIX K

GROUNDWATER LABORATORY DATA SHEETS

(Groundwater Samples Collected July 12, 1996)

CATIONS DATA PACKAGE

CASE NARRATIVE
Cations

Laboratory: CH2M Hill Lab Ref. No: MB369

Client/Project: Brown & Root Coastal Systems Station

I. Holding Time:
All holding times were met.

II. Digestion Exceptions:
None.

III. Analysis:

A. Calibration:
All acceptance criteria were met.

B. Blanks:
All acceptance criteria were met.

C. ICP Interference Check Sample:
Not required for this analysis.

D. Spike Sample(s):
Postspike and prespike recoveries outside criteria are flagged accordingly.

E. Duplicate Sample(s):
All acceptance criteria were met.

F. Laboratory Control Sample(s):
All acceptance criteria were met.

G. ICP Serial Dilution:
Not required for this analysis.

H. Other:
None.

IV. Receipt Exceptions:
Any receipt exceptions will be addressed in a Sample Receipt Exception Report which will be attached to the Chain-of-Custody in this package.

V. Documentation Exceptions:
None.

VI. I certify that this data package is in compliance with the terms and conditions agreed to by the client and Quality Analytical Laboratories, Inc., both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

SIGNED: Kaye Walker DATE: 7/31/96
Kaye Walker / Inorganic Division Mgr

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

323-1

Lab Name: CH2M_HILL_____ Contract: MB369_____

Lab Code: MGM___ Case No.: MB369_ SAS No.: MB369_ SDG No.: MB369_

Matrix (soil/water): WATER Lab Sample ID: MB369001__

Level (low/med): LOW__ Date Received: 07/13/96

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	3.1	B	N	F_
7440-43-9	Cadmium__	3.3	U		P_
7440-47-3	Chromium_	3.2	B		P_
7439-92-1	Lead_____	3.5			F_

Color Before: CLEAR____ Clarity Before: CLEAR_ Texture: N/A___

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:
THE_"N"_QUALIFIER_INDICATES_POOR_PRESPIKE_RECOVERY.

FORM I - IN

ILMO2.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

323-1B

Lab Name: CH2M_HILL_____ Contract: MB369_____

Lab Code: MGM___ Case No.: MB369_ SAS No.: MB369_ SDG No.: MB369_

Matrix (soil/water): WATER Lab Sample ID: MB369002__

Level (low/med): LOW__ Date Received: 07/13/96

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	1.2	B	N	F
7440-43-9	Cadmium__	3.3	U		P
7440-47-3	Chromium_	2.6	B		P
7439-92-1	Lead_____	2.4	B	W	F

Color Before: CLEAR____ Clarity Before: CLEAR_ Texture: N/A___

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:
THE_"W"_QUALIFIER_INDICATES_POOR_POSTSPIKE_RECOVERY.

FORM I - IN

ILMO2.1

GENERAL CHEMISTRY

CASE NARRATIVE
GENERAL CHEMISTRY

QAL Lab Reference No./SDG. MB369

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

All holding times were met.

III. METHOD

The method used is cited in the corresponding Form I.

IV. PREPARATION

Sample preparation proceeded normally, if applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Spikes: All acceptance criteria were met.

D. Duplicates: All acceptance criteria were met.

E. Laboratory Control Samples: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Velinda Herbert DATE: 7/30/96
Velinda Herbert
General Organic/Inorganic Chemist

Report of Analytical Results

Client Sample ID: 323-1
Sample Description: None
Sample Matrix: Water

Date Collected: 07/12/96 (Friday)
Date Received: 07/13/96 (Saturday)

Lab Reference No: MB369
Lab Sample ID: MB369001

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC					
Total Petroleum Hydrocarbons	1.67	mg/L	0.05	07/23/96	EPA418.1

(6544)

Report of Analytical Results

Client Sample ID: 323-18
Sample Description: None
Sample Matrix: Water

Date Collected: 07/12/96 (Friday)
Date Received: 07/13/96 (Saturday)

Lab Reference No: MB369
Lab Sample ID: MB369002

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC					
Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	07/23/96	EPA418.1

(6544)

Brown & Root Environmental
455 FAIRWAY DRIVE, SUITE 200
DEERFIELD BEACH, FLORIDA 33441
(305) 570-5885 (305) 570-5974 (FAX)

SITE MANAGER: G. Goode
PROJECT NAME: CTO-0008
BRE PROJECT NO.: 7113 CODE:
P.O. NO.:

SHIPPED TO: Quality Analytical
(LABORATORY NAME, CITY)

PAGE 1 OF 1

CHAIN OF CUSTODY RECORD

SAMPLED BY (PRINT): C. Bogan
SAMPLER SIGNATURE:

LABORATORY ANALYSIS

☒ STANDARD TAT ☐ RUSH
☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS
RESULTS DUE DATE:

LAB NO.	DATE	TIME	SAMPLE IDENTIFICATION	SAMPLE TYPE COMP.	SAMPLE TYPE GRAB	MATRIX	601 (HCl)	602 (HCl)	8260 (HCl)	504 (N/A)	TPH (H2SO4)	8270 (N/A)	610 (N/A)	Arsenic Chromium Pb (HNO3)	NUMBER OF CONTAINERS
	7-12-96	1320	323-GW-MW01-001				3	3	3	2	1	1	2	1	16
	7-12-96	1250	323-GW-MW01-001 B				3	3	3	2	1	1	2	1	16
			Trip Blank												
			Temp Blank												

TOTAL NUMBER OF CONTAINERS

COMMENTS: Samples Iced

FOR LAB USE ONLY
LAB # MB 369
PROJ #
ACK VERIFIED
HAZWRAP INFEA Y N
QC LEVEL 2
COC 125
ICE
TEMP
PH
ANALYZED
RECEIVED

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)	SEAL INTACT?	DATE / TIME	EMPTY BOTTLES RECEIVED BY (SIGNATURE)	SEAL INTACT?	DATE / TIME
① Michael D. Shine	(YES) NO N/A	DATE: 6/25/96 TIME: 3:45 PM	②	YES NO N/A	DATE: 7-10-96 TIME:
RELINQUISHED BY (SIGNATURE) ③	(YES) NO N/A	DATE: 7-12-96 TIME: 1830	RECEIVED BY (SIGNATURE) ④ FedEx	YES NO N/A	DATE: TIME:
RELINQUISHED BY (SIGNATURE) ⑤	YES NO N/A	DATE: TIME:	RECEIVED BY (SIGNATURE) ⑥ David Shine	(YES) NO N/A	DATE: 7-13-96 TIME: 09:00 A

SPECIAL INSTRUCTIONS:

LABORATORY REMARKS:

SAMPLE CONTAINERS PRECLEANED BY: ☐ BRE ☐ LABORATORY ☒ MANUFACTURER

METHOD OF SHIPMENT: FedEx

BILL OF LADING NO.:

WHITE-FULLY EXECUTED COPY
YELLOW-RECEIVING LABORATORY COPY
PINK-SAMPLERS' COPY/QA COPY
GOLDENROD-SITE MANAGERS' COPY

SAMPLING TEAM: C. Bogan

RECEIVED FOR LABORATORY BY (SIGNATURE): Billy Starr
DATE: 7/13/96 TIME: 09:00

No. 0267

0003117

Sample Receipt Exceptions Report

Batch Number: MB-369 Origination date: 7/13/96

Client/Project: Brown + Root Environmental

SUMMARY OF EXCEPTION (check one if it applies)

√	Description of exception	Comments (write number of exception description and the impacted sample numbers)
	1. No custody seal as required by the project.	Sample ID 323-GW-MW01-001B
	2. No chain-of-custody provided.	COC lists two containers for 610
	3. Chain-of-custody provided but incomplete.	analysis ~~but both c~~ DL One container is
✓	4. Samples broken or leaking on receipt.	broken on arrival. The other container has
	5. Temperature of samples inappropriate for analysis requested.	a broken cap.
	6. Container inappropriate for analysis requested.	Sample ID 323-GW-MW01-001 COC
	7. Inadequate sample volume for analysis requested.	lists ~~3~~ DL three containers for 8260
	8. Preservation inappropriate for analysis requested.	analysis but only two were sent.
	9. Samples received out of holding time for analysis requested.	
	10. Samples received more than 72 hours after sampling.	
	11. Discrepancies between chain-of-custody and container labels.	
	12. Other (describe on right)	

FRACTION(S) AFFECTED (specify which fraction was affected by the exceptions detailed above by writing the number of the exception next to it)

Unpreserved		Nutrients		Metals		Volatiles	
Cyanide		Extractables		Extractables	✓	Other (specify)	

ACTION TAKEN:

Originator: David Shine Supervisor:

Client was notified on: (DATE/TIME) 7/15 Client contact: Terry Goode

Client's comments: Proceed w/ other analyses — add Pb furnace to metals

Client Services: Pam QA officer:

GC/MS VOLATILE ORGANICS

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

QAL Lab Reference No./SDG. MB369

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: N/A

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: SW-846 8260

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: Project QC was neither requested nor designated for this batch. Therefore, spike results are neither included nor referenced with this report. All internal QC requirements were met.

E. Samples: Sample analysis proceeded normally.

F. Other: Please note that the Form 1's reflect the specified target list.

Currently, there are not enough data points collected to produce control charts for the surrogate, 1,2-Dichloroethane-d4. These charts are in the process of being developed.

A summary of the most current applicable method detection limits (MDLs) immediately follows the case narrative.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Matty Hiser for DATE: 8/6/96
Debra A. Vergin
Chemist

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH[1]
MB369001	323-1	WATER	07/12/96	N/A	07/17/96	<2
MB369002	323-1B	WATER	07/12/96	N/A	07/17/96	<2
MB369003	TRIP_BLANK	WATER	07/12/96	N/A	07/18/96	<2
X07176B2	VBLK0Q	WATER	N/A	N/A	07/17/96	N/A
X07186B2	VBLK0S	WATER	N/A	N/A	07/17/96	N/A

[1] Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER

Analytical Method: SW8260 Extraction Method:

	MDL ug/L
Acetone	1.36
Acetonitrile	7.27
Acrolein	5.11
Acrylonitrile	4.90
Benzene	0.43
Bromobenzene	0.39
Bromochloromethane	0.32
Bromodichloromethane	0.39
Bromofluorobenzene	1.43
Bromoform	0.41
Bromomethane	0.50
2-Butanone	0.77
Carbon Disulfide	0.45
Carbon Tetrachloride	0.37
Chlorobenzene	0.53
Chloroethane	0.37
2-Chloroethylvinyl ether	0.39
Chloroform	0.21
Chloromethane	0.30
Chloroprene	0.73
3-Chloropropene	0.22
2-Chlorotoluene	1.11
4-Chlorotoluene	0.50
Cis-1,2-Dichloroethene	0.28
cis-1,3-Dichloropropene	0.26
Cyclohexanone	33.46
1,2-Dibromo-3-chloropropane	1.26
Dibromochloromethane	0.29
1,2-Dibromoethane	0.39
Dibromofluoromethane	1.97
Dibromomethane	0.42
1,2-Dichlorobenzene	0.66
1,3-Dichlorobenzene	0.61
1,4-Dichlorobenzene	0.65
Dichlorodifluoromethane	0.62
1,1-Dichloroethane	0.42
1,2-Dichloroethane	0.39
1,1-Dichloroethene	0.37
1,2-Dichloroethene (total)	0.48
Dichlorofluoromethane	0.35
1,2-Dichloropropane	0.39
1,3-Dichloropropane	0.28
2,2-Dichloropropane	0.23

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER

Analytical Method: SW8260 Extraction Method:

	MDL ug/L
1,1-Dichloropropene	0.45
1,4-Dioxane	12.96
Ethyl ether	0.36
Ethyl methacrylate	0.51
Ethylbenzene	0.62
Hexachlorobutadiene	1.17
2-Hexanone	0.80
Iodomethane	1.47
Isobutyl alcohol	11.96
Isopropylbenzene	0.45
m-,p-Xylene	1.07
Methacrylonitrile	0.37
Methyl methacrylate	0.40
Methyl tert-butyl ether	0.27
4-Methyl-2-pentanone	0.39
Methylene Chloride	0.38
n-Butylbenzene	0.64
n-Propylbenzene	0.53
Naphthalene	2.30
o-Xylene	0.59
p-Isopropyltoluene	0.68
Pentachloroethane	0.31
Propionitrile	4.87
sec-Butylbenzene	0.51
Styrene	0.55
tert-Butylbenzene	0.46
1,1,1,2-Tetrachloroethane	0.33
1,1,2,2-Tetrachloroethane	0.78
Tetrachloroethene	0.46
Tetrahydrofuran	5.47
Toluene	0.45
Toluene-d8	1.26
trans-1,2-Dichloroethene	0.26
trans-1,3-Dichloropropene	0.43
trans-1,4-Dichloro-2-butene	0.58
1,1,2-Trichloro-1,2,2-trifluoroet	1.87
1,2,3-Trichlorobenzene	1.72
1,2,4-Trichlorobenzene	1.19
1,1,1-Trichloroethane	0.41
1,1,2-Trichloroethane	0.44
Trichloroethene	0.44
Trichlorofluoromethane	0.57
1,2,3-Trichloropropane	0.87

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER

Analytical Method: SW8260 Extraction Method: _____

	MDL ug/L
1,2,4-Trimethylbenzene	0.44
1,3,5-Trimethylbenzene	0.65
Vinyl acetate	1.16
Vinyl Chloride	0.37
Xylene (total)	1.59

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-1

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369001

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 17JUL1701017.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec. _____ Date Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
110-75-8	2-Chloroethylvinyl ether	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	3	J
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

323-1

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369001

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 17JUL1701017.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec. _____ Data Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	108-67-8	Benzene, 1,3,5-trimethyl-	26.365	34	NJ
2.	91-20-3	Naphthalene	32.099	69	NJ
3.		Naphthalene, methyl isomer	34.490	32	NJ
4.		Naphthalene, methyl isomer	34.922	15	NJ
5.					
6.					
7.					
8.					
9.					
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30.					

mTP

FORM I VOA-TIC

SW846-826

Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071796b.b/17Jul1701017.d
Lab Smp Id: MB369001 Client Smp ID: 323-1
Inj Date : 17-JUL-1996 21:09 Autotune Date: 17-Jul-96 10:51
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 323-1 MB369001
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071796b.b/8260w5.m
Meth Date : 29-Jul-1996 14:25 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 17
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
* 1 Pentafluorobenzene	168.00	13.735	13.722	(1.000)	1726849	50	
3 Chloromethane	50.00		3.198	Compound Not Detected.			
4 Vinyl chloride	62.00		3.532	Compound Not Detected.			
5 Bromomethane	94.00		4.722	Compound Not Detected.			
6 Chloroethane	64.00		5.047	Compound Not Detected.			
7 Trichlorofluoromethane	101.00		5.794	Compound Not Detected.			
11 1,1-Dichloroethene	96.00		7.555	Compound Not Detected.			
16 Methylene chloride	84.00		9.001	Compound Not Detected.			
19 trans-1,2-Dichloroethene	96.00		9.808	Compound Not Detected.			
21 1,1-Dichloroethane	63.00		11.047	Compound Not Detected.			
31 Chloroform	83.00		13.162	Compound Not Detected.			
33 1,1,1-Trichloroethane	97.00		14.175	Compound Not Detected.			
35 Carbon tetrachloride	117.00		14.775	Compound Not Detected.			
* 36 1,4-Difluorobenzene	114.00	16.037	16.014	(1.000)	2175838	50	
37 1,2-Dichloroethane	62.00		15.217	Compound Not Detected.			
38 Benzene	78.00		15.188	Compound Not Detected.			
39 Trichloroethene	95.00		16.654	Compound Not Detected.			
41 1,2-Dichloropropane	63.00		17.067	Compound Not Detected.			
43 Bromodichloromethane	83.00		17.549	Compound Not Detected.			
45 2-Chloroethylvinyl ether	63.00		18.375	Compound Not Detected.			
46 cis-1,3-Dichloropropene	75.00		18.788	Compound Not Detected.			
* 48 Chlorobenzene-d5	117.00	22.371	22.378	(1.000)	1692813	50	
49 Toluene	91.00		19.427	Compound Not Detected.			

Rev mtp 8/2/96
UOXH
000012

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
51 trans-1,3-Dichloropropene	75.00		19.870		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.145		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.775		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.159		Compound Not Detected.		
58 Chlorobenzene	112.00		22.447		Compound Not Detected.		
60 Ethylbenzene	91.00	22.608	22.604	(1.011)	173415	3	3(a)
66 Bromoform	173.00		24.336		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		24.759		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.319	27.316	(1.000)	852912	50	
$ 91 Dibromofluoromethane	113.00	13.745	13.722	(1.001)	903498	50	50
$ 92 1,2-Dichloroethane-d4	65.00	14.994	14.991	(0.935)	384790	46	46
$ 93 Toluene-d8	98.00	19.273	19.270	(1.202)	2004081	50	50
$ 94 Bromofluorobenzene	174.00	24.890	24.886	(1.113)	815539	49	49

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071796b.b/17Jul1701017.d
Lab Smp Id: MB369001 Client Smp ID: 323-1
Inj Date : 17-JUL-1996 21:09 Autotune Date: 17-Jul-96 10:51:2
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 323-1 MB369001
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071796b.b/8260w5.m
Meth Date : 29-Jul-1996 14:25 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 17
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

ISTD	RT	AREA	AMOUNT
* 69 1,4-Dichlorobenzene-d4	27.319	4989203	50.000

	RT	AREA	CONCENTRATIONS ON-COL(ug/L)	FINAL(ug/L)	QUAL	QUANT LIBRARY	LIB ENTRY	CPND #
Benzene, 1,3,5-trimethyl- CAS #: 108-67-8	26.365	3365108	34	34	95	NBS75K.1	64569	69
Naphthalene CAS #: 91-20-3	32.099	6884751	69	69	97	NBS75K.1	65151	69
Naphthalene, methyl isomer CAS #: ~~91-57-6~~ MTP	34.490	3193282	32	32	97	NBS75K.1	66236	69
Naphthalene, methyl isomer CAS #: ~~91-57-6~~ MTP	34.922	1530632	15	15	94	NBS75K.1	66236	69

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-1B

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369002

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 17JUL1801018.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec. _____ Date Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
110-75-8	2-Chloroethylvinyl ether	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h073096.b/h0006768.d
Lab Smp Id: W07176B1 Client Smp ID: SBLK8D
Inj Date : 30-JUL-1996 18:36
Operator : mjohnson Inst ID: ms3.i
Smp Info : W07176B1 SBLK8D
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 31-Jul-1996 17:42 mjohnson
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 4 QC Sample: BLANK
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
* 16 1,4-Dichlorobenzene-d4	6.635	233646	40.000

		CONCENTRATIONS			QUANT		
RT	AREA	ON-COL(NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	CPND #
2-Pentanone, 4-hydroxy-4-methyl-				CAS #: 123-42-2			
5.096	36550	6	3	50	NBS75K.l	64275	16

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK8E

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: S07176B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006769.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec. 0 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
62-75-9	N-Nitrosodimethylamine	330	U
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	330	U
621-64-7	N-Nitroso-di-n-propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-methylphenol	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
91-58-7	2-Chloronaphthalene	330	U
131-11-3	Dimethylphthalate	330	U
606-20-2	2,6-Dinitrotoluene	330	U
208-96-8	Acenaphthylene	330	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	1700	U
100-02-7	4-Nitrophenol	1700	U
121-14-2	2,4-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
86-73-7	Fluorene	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK8E

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: S07176B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006769.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec. 0 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
534-52-1	4,6-Dinitro-2-methylphenol	1700	U
86-30-6	N-Nitrosodiphenylamine (3)	330	U
122-66-7	1,2-Diphenylhydrazine	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	1700	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
84-74-2	Di-n-butylphthalate	330	U
206-44-0	Fluoranthene	330	U
92-87-5	Benzidine	1700	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
56-55-3	Benzo(a)anthracene	330	U
91-94-1	3,3'-Dichlorobenzidine	670	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)phthalate	330	U
117-84-0	Di-n-octylphthalate	330	U
205-99-2	Benzo(b)fluoranthene	330	U
207-08-9	Benzo(k)fluoranthene	330	U
50-32-8	Benzo(a)pyrene	330	U
193-39-5	Indeno(1,2,3-cd)pyrene	330	U
53-70-3	Dibenz(a,h)anthracene	330	U
191-24-2	Benzo(g,h,i)perylene	330	U

(3) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK8E

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: S07176B1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006769.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec. 0 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/30/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 15

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	57-55-6	Propylene Glycol	4.136	210	NJ
2.	68-12-2	Formamide, N,N-dimethyl-	4.561	670	NJ
3.	141-79-7	3-Penten-2-one, 4-methyl-	4.715	550	NJA
4.		Unknown	4.898	660	J
5.		Unknown Alkane	5.022	160	J
6.	123-42-2	2-Pentanone, 4-hydroxy-4-met	5.147	28000	NJA
7.	3074-71-3	Heptane, 2,3-dimethyl-	5.213	440	NJ
8.		Unknown Alkane	5.257	700	J
9.		Unknown	5.323	600	J
10.	108-94-1	Cyclohexanone	5.623	170	NJ
11.		Unknown	5.733	320	J
12.		Unknown	5.843	72	J
13.		Unknown	5.960	250	J
14.		Unknown	6.298	110	J
15.		Unknown	6.488	73	J
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

MTP/8r

FORM I SV-TIC SW846

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h073096.b/h0006769.d
Lab Smp Id: S07176B1 Client Smp ID: SBLK8E
Inj Date : 30-JUL-1996 19:15
Operator : mjohnson Inst ID: ms3.i
Smp Info : S07176B1 SBLK8E
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 31-Jul-1996 17:42 mjohnson Quant Type: ISTD
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 5 QC Sample: BLANK
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/Kg)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.382	5.384	(0.811)	165460	140	2400
$	9 Phenol-d5	99.00	6.188	6.190	(0.933)	211965	150	2500
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.635	6.637	(1.000)	28800	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.338	7.340	(0.877)	99032	81	1300
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.371	8.374	(1.000)	110867	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.291	10.294	(0.875)	141662	82	1400
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

Rev MNP 8/7/96
MED 8/1

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/Kg)
65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
66 Acenaphthylene	152.00	Compound Not Detected.					
* 68 Acenaphthene-d10	164.00	11.764	11.766	(1.000)	56403	40	
69 Acenaphthene	154.00	Compound Not Detected.					
70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
71 4-Nitrophenol	65.00	Compound Not Detected.					
74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
78 Diethylphthalate	149.00	Compound Not Detected.					
79 Fluorene	166.00	Compound Not Detected.					
80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$ 86 2,4,6-Tribromophenol	329.65	13.559	13.562	(1.153)	39859	120	2100
89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
90 Hexachlorobenzene	284.00	Compound Not Detected.					
92 Pentachlorophenol	266.00	Compound Not Detected.					
* 95 Phenanthrene-d10	188.00	15.157	15.166	(1.000)	81858	40	
96 Phenanthrene	178.00	Compound Not Detected.					
97 Anthracene	178.00	Compound Not Detected.					
99 Di-n-butylphthalate	149.00	Compound Not Detected.					
102 Fluoranthene	202.00	Compound Not Detected.					
103 Benzidine	184.00	Compound Not Detected.					
104 Pyrene	202.00	Compound Not Detected.					
$ 106 Terphenyl-d14	244.00	19.026	19.021	(0.879)	139728	100	1700
110 Butylbenzylphthalate	149.00	Compound Not Detected.					
112 Benzo(a)anthracene	228.00	Compound Not Detected.					
113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
* 114 Chrysene-d12	240.00	21.649	21.659	(1.000)	61828	40	
115 Chrysene	228.00	Compound Not Detected.					
116 bis(2-Ethylhexyl)phthalate	149.00	Compound Not Detected.					
117 Di-n-octylphthalate	149.00	Compound Not Detected.					
118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
122 Benzo(a)pyrene	252.00	Compound Not Detected.					
* 123 Perylene-d12	264.00	25.086	25.095	(1.000)	59921	40	
125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h073096.b/h0006769.d
Lab Smp Id: S07176B1 Client Smp ID: SBLK8E
Inj Date : 30-JUL-1996 19:15
Operator : mjohnson Inst ID: ms3.i
Smp Info : S07176B1 SBLK8E
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 31-Jul-1996 17:42 mjohnson
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 5 QC Sample: BLANK
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: SOIL
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
* 16 1,4-Dichlorobenzene-d4	6.635	209974	40.000

RT	AREA	CONCENTRATIONS ON-COL(NG)	FINAL(ug/Kg)	QUAL	QUANT LIBRARY	LIB ENTRY	CPND #
Propylene Glycol					CAS #: 57-55-6		
4.136	66798	13	210	64	NBS75K.l	62604	16
Formamide, N,N-dimethyl-					CAS #: 68-12-2		
4.561	212382	40	670	91	NBS75K.l	62526	16
3-Penten-2-one, 4-methyl-					CAS #: 141-79-7		
4.715	173237	33	550	76	NBS75K.l	63216	16(L)
Unknown					CAS #:		
4.898	206376	39	660	0		0	16
Unknown Alkane					CAS #:		
5.022	48878	9	160	0		0	16
2-Pentanone, 4-hydroxy-4-methyl-					CAS #: 123-42-2		
5.147	8857015	1700	28000	50	NBS75K.l	64274	16

RT	AREA	CONCENTRATIONS ON-COL(NG)	FINAL(ug/Kg)	QUAL	QUANT LIBRARY	LIB ENTRY	CPND #-
Heptane, 2,3-dimethyl-					CAS #: 3074-71-3		
5.213	138194	26	440	78	NBS75K.l	5152	16
Unknown Alkane					CAS #:		
5.257	220147	42	700	0		0	16(L)
Unknown ~~Alkane~~ MTP 8/7/96					CAS #:		
5.323	188230	36	600	0		0	16
Cyclohexanone					CAS #: 108-94-1		
5.623	52809	10	170	83	NBS75K.l	1276	16(L)
Unknown					CAS #:		
5.733	102027	19	320	0		0	16
Unknown ~~Alkane~~ MTP 8/7/96					CAS #:		
5.843	22597	4	72	0		0	16
Unknown					CAS #:		
5.960	80004	15	250	0		0	16
Unknown					CAS #:		
6.298	33956	6	110	0		0	16
Unknown					CAS #:		
6.488	22889	4	73	0		0	16

QC Flag Legend

L - Operator selected an alternate library search match.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068MS

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001MS

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006778.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/31/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
62-75-9	N-Nitrosodimethylamine	370	U
108-95-2	Phenol	3000	E
111-44-4	bis(2-Chloroethyl)ether	370	U
95-57-8	2-Chlorophenol	3000	E
541-73-1	1,3-Dichlorobenzene	370	U
106-46-7	1,4-Dichlorobenzene	1400	
95-50-1	1,2-Dichlorobenzene	370	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	370	U
621-64-7	N-Nitroso-di-n-propylamine	1800	
67-72-1	Hexachloroethane	370	U
98-95-3	Nitrobenzene	370	U
78-59-1	Isophorone	370	U
88-75-5	2-Nitrophenol	370	U
105-67-9	2,4-Dimethylphenol	370	U
111-91-1	bis(2-Chloroethoxy)methane	370	U
120-83-2	2,4-Dichlorophenol	370	U
120-82-1	1,2,4-Trichlorobenzene	1400	
91-20-3	Naphthalene	370	U
87-68-3	Hexachlorobutadiene	370	U
59-50-7	4-Chloro-3-methylphenol	2900	
88-06-2	2,4,6-Trichlorophenol	45	J
91-58-7	2-Chloronaphthalene	370	U
131-11-3	Dimethylphthalate	370	U
606-20-2	2,6-Dinitrotoluene	370	U
208-96-8	Acenaphthylene	370	U
83-32-9	Acenaphthene	1400	
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	3200	E
121-14-2	2,4-Dinitrotoluene	1600	
84-66-2	Diethylphthalate	370	U
86-73-7	Fluorene	370	U
7005-72-3	4-Chlorophenyl-phenylether	43	J

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068MS

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001MS

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006778.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/31/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
534-52-1	4,6-Dinitro-2-methylphenol	1800	U
86-30-6	N-Nitrosodiphenylamine (3)	370	U
122-66-7	1,2-Diphenylhydrazine	370	U
101-55-3	4-Bromophenyl-phenylether	370	U
118-74-1	Hexachlorobenzene	370	U
87-86-5	Pentachlorophenol	1600	J
85-01-8	Phenanthrene	46	J
120-12-7	Anthracene	370	U
84-74-2	Di-n-butylphthalate	120	J
206-44-0	Fluoranthene	370	U
92-87-5	Benzidine	1800	U
129-00-0	Pyrene	2000	
85-68-7	Butylbenzylphthalate	72	J
56-55-3	Benzo(a)anthracene	370	U
91-94-1	3,3'-Dichlorobenzidine	730	U
218-01-9	Chrysene	370	U
117-81-7	bis(2-Ethylhexyl)phthalate	120	J
117-84-0	Di-n-octylphthalate	52	J
205-99-2	Benzo(b)fluoranthene	370	U
207-08-9	Benzo(k)fluoranthene	370	U
50-32-8	Benzo(a)pyrene	370	U
193-39-5	Indeno(1,2,3-cd)pyrene	370	U
53-70-3	Dibenz(a,h)anthracene	370	U
191-24-2	Benzo(g,h,i)perylene	370	U

(3) - Cannot be separated from Diphenylamine

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h073096.b/h0006778.d
Lab Smp Id: MB382001MS Client Smp ID: 323-068MS
Inj Date : 31-JUL-1996 01:06
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB382001MS 323-068MS
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 05-Aug-1996 15:19 dvergin Quant Type: ISTD
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 14 QC Sample: MS
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/Kg)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.389	5.384	(0.812)	248595	160	2900
$	9 Phenol-d5	99.00	6.202	6.190	(0.935)	303479	160	2900
	10 Phenol	94.00	6.209	6.205	(0.936)	311668	160	3000(A)
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	6.444	6.439	(0.971)	246310	160	3000(A)
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.634	6.637	(1.000)	38908	40	
	17 1,4-Dichlorobenzene	146.00	6.649	6.659	(1.002)	128832	78	1400
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	7.096	7.106	(1.070)	106256	98	1800(Q)
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.338	7.340	(0.877)	134541	85	1600
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	8.283	8.286	(0.989)	93700	74	1400
*	42 Naphthalene-d8	136.00	8.371	8.374	(1.000)	143664	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	9.228	9.224	(1.102)	213422	160	2900
	55 2,4,6-Trichlorophenol	196.00	10.152	10.147	(0.863)	1643	2	45(a)
$	57 2-Fluorobiphenyl	172.00	10.291	10.294	(0.875)	191319	88	1600
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

Rev mmp 8/7/96
DU for MRT 8/7/96

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/Kg)
65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
66 Acenaphthylene	152.00	Compound Not Detected.					
* 68 Acenaphthene-d10	164.00	11.764	11.766	(1.000)	71693	40	
69 Acenaphthene	154.00	11.837	11.840	(1.006)	158447	76	1400
70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
71 4-Nitrophenol	65.00	11.984	11.972	(1.019)	116930	180	3200(AR)
74 2,4-Dinitrotoluene	165.00	12.233	12.235	(1.040)	73439	87	1600
78 Diethylphthalate	149.00	Compound Not Detected.					
79 Fluorene	166.00	Compound Not Detected.					
80 4-Chlorophenyl-phenylether	204.00	12.907	12.909	(1.097)	2486	2	43(a)
83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$ 86 2,4,6-Tribromophenol	329.65	13.566	13.562	(1.153)	72216	180	3300(A)
89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
90 Hexachlorobenzene	284.00	Compound Not Detected.					
92 Pentachlorophenol	266.00	14.841	14.844	(0.979)	48347	88	1600(a)
* 95 Phenanthrene-d10	188.00	15.156	15.166	(1.000)	111451	40	
96 Phenanthrene	178.00	15.208	15.218	(1.003)	9948	2	46(a)
97 Anthracene	178.00	Compound Not Detected.					
99 Di-n-butylphthalate	149.00	16.563	16.573	(1.093)	36961	7	120(a)
102 Fluoranthene	202.00	Compound Not Detected.					
103 Benzidine	184.00	Compound Not Detected.					
104 Pyrene	202.00	18.688	18.684	(0.863)	288627	110	2000
$ 106 Terphenyl-d14	244.00	19.025	19.021	(0.879)	202145	120	2200
110 Butylbenzylphthalate	149.00	20.249	20.252	(0.935)	7736	4	72(a)
112 Benzo(a)anthracene	228.00	Compound Not Detected.					
113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
* 114 Chrysene-d12	240.00	21.656	21.659	(1.000)	76397	40	
115 Chrysene	228.00	Compound Not Detected.					
116 bis(2-Ethylhexyl)phthalate	149.00	21.634	21.637	(0.999)	17902	6	120(a)
117 Di-n-octylphthalate	149.00	23.048	23.051	(0.919)	13450	3	52(a)
118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
122 Benzo(a)pyrene	252.00	Compound Not Detected.					
* 123 Perylene-d12	264.00	25.093	25.095	(1.000)	61144	40	
125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068MSD

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001MSD

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006779.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/31/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
62-75-9	N-Nitrosodimethylamine	370	U
108-95-2	Phenol	2900	E
111-44-4	bis(2-Chloroethyl)ether	370	U
95-57-8	2-Chlorophenol	2900	
541-73-1	1,3-Dichlorobenzene	370	U
106-46-7	1,4-Dichlorobenzene	1400	
95-50-1	1,2-Dichlorobenzene	370	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	370	U
621-64-7	N-Nitroso-di-n-propylamine	1700	
67-72-1	Hexachloroethane	370	U
98-95-3	Nitrobenzene	370	U
78-59-1	Isophorone	47	J
88-75-5	2-Nitrophenol	370	U
105-67-9	2,4-Dimethylphenol	370	U
111-91-1	bis(2-Chloroethoxy)methane	38	J
120-83-2	2,4-Dichlorophenol	370	U
120-82-1	1,2,4-Trichlorobenzene	1300	
91-20-3	Naphthalene	370	U
87-68-3	Hexachlorobutadiene	370	U
59-50-7	4-Chloro-3-methylphenol	2800	
88-06-2	2,4,6-Trichlorophenol	370	U
91-58-7	2-Chloronaphthalene	370	U
131-11-3	Dimethylphthalate	370	U
606-20-2	2,6-Dinitrotoluene	370	U
208-96-8	Acenaphthylene	370	U
83-32-9	Acenaphthene	1400	
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	2800	
121-14-2	2,4-Dinitrotoluene	1400	
84-66-2	Diethylphthalate	370	U
86-73-7	Fluorene	370	U
7005-72-3	4-Chlorophenyl-phenylether	370	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-068MSD

Lab Name: CH2M HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: SDG No.: MB382

Matrix: (soil/water) SOIL Lab Sample ID: MB382001MSD

Sample wt/vol: 30.0 (g/mL) G Lab File ID: H0006779.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec. 9 dec. Date Extracted: 07/17/96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/31/96

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
534-52-1	4,6-Dinitro-2-methylphenol	1800	U
86-30-6	N-Nitrosodiphenylamine (3)	370	U
122-66-7	1,2-Diphenylhydrazine	370	U
101-55-3	4-Bromophenyl-phenylether	370	U
118-74-1	Hexachlorobenzene	370	U
87-86-5	Pentachlorophenol	2100	
85-01-8	Phenanthrene	370	U
120-12-7	Anthracene	370	U
84-74-2	Di-n-butylphthalate	110	J
206-44-0	Fluoranthene	370	U
92-87-5	Benzidine	1800	U
129-00-0	Pyrene	2000	
85-68-7	Butylbenzylphthalate	370	U
56-55-3	Benzo(a)anthracene	370	U
91-94-1	3,3'-Dichlorobenzidine	730	U
218-01-9	Chrysene	370	U
117-81-7	bis(2-Ethylhexyl)phthalate	99	J
117-84-0	Di-n-octylphthalate	370	U
205-99-2	Benzo(b)fluoranthene	370	U
207-08-9	Benzo(k)fluoranthene	370	U
50-32-8	Benzo(a)pyrene	370	U
193-39-5	Indeno(1,2,3-cd)pyrene	370	U
53-70-3	Dibenz(a,h)anthracene	370	U
191-24-2	Benzo(g,h,i)perylene	370	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846 MTP

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h073096.b/h0006779.d
Lab Smp Id: MB382001MSD Client Smp ID: 323-068MSD
Inj Date : 31-JUL-1996 01:46
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB382001MSD 323-068MSD
Misc Info :
Comment :
Method : /chem/ms3.i/h073096.b/SV8270.m
Meth Date : 05-Aug-1996 15:19 dvergin Quant Type: ISTD
Cal Date : 30-JUL-1996 17:14 Cal File: h0006766.d
Als bottle: 15 QC Sample: MSD
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/Kg)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.390	5.384	(0.812)	202186	160	2900
$	9 Phenol-d5	99.00	6.196	6.190	(0.934)	241196	150	2800
	10 Phenol	94.00	6.210	6.205	(0.936)	249696	160	2900(A)
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	6.445	6.439	(0.971)	196890	160	2900
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.635	6.637	(1.000)	32092	40	
	17 1,4-Dichlorobenzene	146.00	6.657	6.659	(1.003)	101962	74	1400
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	7.097	7.106	(1.070)	83906	94	1700(Q)
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.339	7.340	(0.877)	102638	83	1500
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	7.647	7.648	(0.913)	6546	2	47(a)
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	7.896	7.905	(0.943)	2954	2	38(a)
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	8.284	8.286	(0.989)	71841	73	1300
*	42 Naphthalene-d8	136.00	8.372	8.374	(1.000)	112047	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	9.229	9.224	(1.102)	162144	150	2800
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.292	10.294	(0.874)	146121	83	1500
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

Rev MTP 8/7/96
DW for MRJ 8/7/96

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/Kg)
65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
66 Acenaphthylene	152.00	Compound Not Detected.					
* 68 Acenaphthene-d10	164.00	11.772	11.766	(1.000)	57813	40	
69 Acenaphthene	154.00	11.845	11.840	(1.006)	125583	75	1400
70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
71 4-Nitrophenol	65.00	11.985	11.972	(1.018)	81195	150	2800(Q)
74 2,4-Dinitrotoluene	165.00	12.234	12.235	(1.039)	52387	77	1400
78 Diethylphthalate	149.00	Compound Not Detected.					
79 Fluorene	166.00	Compound Not Detected.					
80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$ 86 2,4,6-Tribromophenol	329.65	13.567	13.562	(1.153)	56913	180	3200(A)
89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
90 Hexachlorobenzene	284.00	Compound Not Detected.					
92 Pentachlorophenol	266.00	14.850	14.844	(0.979)	50700	110	2100
* 95 Phenanthrene-d10	188.00	15.165	15.166	(1.000)	91807	40	
96 Phenanthrene	178.00	Compound Not Detected.					
97 Anthracene	178.00	Compound Not Detected.					
99 Di-n-butylphthalate	149.00	16.564	16.573	(1.092)	26053	6	110(a)
102 Fluoranthene	202.00	Compound Not Detected.					
103 Benzidine	184.00	Compound Not Detected.					
104 Pyrene	202.00	18.689	18.684	(0.863)	214294	110	2000
$ 106 Terphenyl-d14	244.00	19.026	19.021	(0.878)	141126	110	2100
110 Butylbenzylphthalate	149.00	Compound Not Detected.					
112 Benzo(a)anthracene	228.00	Compound Not Detected.					
113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
* 114 Chrysene-d12	240.00	21.664	21.659	(1.000)	56622	40	
115 Chrysene	228.00	Compound Not Detected.					
116 bis(2-Ethylhexyl)phthalate	149.00	21.642	21.637	(0.999)	11085	5	99(a)
117 Di-n-octylphthalate	149.00	Compound Not Detected.					
118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
122 Benzo(a)pyrene	252.00	Compound Not Detected.					
* 123 Perylene-d12	264.00	25.094	25.095	(1.000)	46155	40	
125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
Q - Qualifier signal failed the ratio test.

Brown & Root Environmental
455 FAIRWAY DRIVE, SUITE 200
DEERFIELD BEACH, FLORIDA 33441
(305) 570-5885 (305) 570-5974 (FAX)

SITE MANAGER: G. Goode
PROJECT NAME: CTO 0008
BRE PROJECT NO.: 7113 CODE:
P.O. NO.: 2049-7113-P96249

SHIPPED TO: Quality Analytical LAB
Montgomery, ALA
(LABORATORY NAME, CITY)

PAGE 1 OF 1

CHAIN OF CUSTODY RECORD

LABORATORY ANALYSIS

SAMPLED BY (PRINT): C. Burgin
SAMPLER SIGNATURE:

☑ STANDARD TAT ☐ RUSH
☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS
RESULTS DUE DATE:

LAB NO.	DATE 96	TIME	SAMPLE IDENTIFICATION	SAMPLE TYPE COMP.	SAMPLE TYPE GRAB	MATRIX	PARAMETERS / PRES. TYPE: RCRA Metals N/A	TCLP Metals N/A	8240 Priority Pollutants N/A	8270 N/A	TRPH N/A					NUMBER OF CONTAINERS	COMMENTS:	
	7-12	1732	323-SS-SB14-068	✓		soil	1	1	1	1	1					5	samples ICED	01
	7-12	1725	323-SS-SB14-06B			AQU						1				1	Extra volume Added For MS & MSD from SB14	02
																	Received samples 7/15/96 prior to shipment.	
TOTAL NUMBER OF CONTAINERS							1	1	1	1	1					6		

FOR LAB USE ONLY
LAB # MB382
PROJ #
ACK VERIFIED
HAZWRAP/NEESA Y N
% LEVEL 1 2 3
COC DS ICE
ANALREQ TEMP
CUST SEAL PH
SAMPLE COND.

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)	SEAL INTACT?	DATE / TIME	EMPTY BOTTLES RECEIVED BY (SIGNATURE)	SEAL INTACT?	DATE / TIME
① Michael D. Shine	(YES) NO N/A	DATE: 6/25/96 TIME: 3:45 pm	②	(YES) NO N/A	DATE: 7-10-96 TIME: 1200
RELINQUISHED BY (SIGNATURE) ③	SEAL INTACT? (YES) NO N/A	DATE: 7-12-96 TIME: 2140	RECEIVED BY (SIGNATURE) ④	SEAL INTACT? (YES) NO N/A	DATE: 7/15/96 TIME: 8:00 am
RELINQUISHED BY (SIGNATURE) ⑤	SEAL INTACT? (YES) NO N/A	DATE: 7/15/96 TIME: 8:15 am	RECEIVED BY (SIGNATURE) ⑥ Fed Ex	SEAL INTACT? YES NO N/A	DATE: TIME:

SPECIAL INSTRUCTIONS:

LABORATORY REMARKS:

SAMPLE CONTAINERS PRECLEANED BY: ☐ BRE ☐ LABORATORY ☑ MANUFACTURER

METHOD OF SHIPMENT: Fed Ex

BILL OF LADING NO.: 6687475491

WHITE-FULLY EXECUTED COPY
YELLOW-RECEIVING LABORATORY COPY
PINK-SAMPLERS' COPY/QA COPY

SAMPLING TEAM: C. Burgin

RECEIVED FOR LABORATORY BY (SIGNATURE): Paul Gonzalez

No. 0287

Sample Receipt Exceptions Report

Batch Number: MB 382 Origination date: 7/16/96

Client/Project: Brown & Root

SUMMARY OF EXCEPTION (check one if it applies)

√	Description of exception	Comments (write number of exception description and the impacted sample numbers)
	1. No custody seal as required by the project.	Container labels for MS/MSD were not filled out with sample ID's, analyses, dates or times.
	2. No chain-of-custody provided.	
√	3. Chain-of-custody provided but incomplete.	
	4. Samples broken or leaking on receipt.	
	5. Temperature of samples inappropriate for analysis requested.	No analyses indicated for rinsate blank
	6. Container inappropriate for analysis requested.	
	7. Inadequate sample volume for analysis requested.	
	8. Preservation inappropriate for analysis requested.	
	9. Samples received out of holding time for analysis requested.	
√	10. Samples received more than 72 hours after sampling.	
√	11. Discrepancies between chain-of-custody and container labels.	
	12. Other (describe on right)	

FRACTION(S) AFFECTED (specify which fraction was affected by the exceptions detailed above by writing the number of the exception next to it)

Unpreserved		Nutrients		Metals		Volatiles	
Cyanide		Extractables		Extractables		Other (specify)	

ACTION TAKEN:

Originator: Paul Gunsaulus Supervisor: [illegible]

Client was notified on: (DATE/TIME) 7/16 Client contact: Jerry Goodw

Client's comments: Add MS/MSD for 323-SS-SB14-068

Split 2c blank container for 8 RCRA metals & SVOC (8270) - preserve accordingly

Client Services: [illegible] QA officer:

000259

QAL Montgomery

RECT_CAR.DOC (2/21/

CATIONS DATA PACKAGE

CASE NARRATIVE
Cations

Laboratory: CH2M HILL Lab Ref. No.: MB382

Client/Project: Brown & Root Coastal Systems Station

I. Holding Time:
All holding times were met.

II. Digestion Exceptions:
None.

III. Analysis:

A. Calibration:
All acceptance criteria were met.

B. Blanks:
All acceptance criteria were met.

C. ICP Interference Check Sample:
All acceptance criteria were met.

D. Spike Sample(s):
Prespike and postspike recoveries outside criteria are flagged accordingly.

E. Duplicate Sample(s):
All acceptance criteria were met.

F. Laboratory Control Sample(s):
All acceptance criteria were met.

G. ICP Serial Dilution:
All acceptance criteria were met.

H. Other:
None.

IV. Receipt Exceptions:
Any receipt exception will be addressed in a Sample Receipt Exception Report which will be attached to the Chain-of-Custody in this package.

V. Documentation Exceptions:
None.

VI. I certify that this data package is in compliance with the terms and conditions agreed to by the client and Quality Analytical Laboratories, Inc., both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

SIGNED: Kaye Walker DATE: 8/6/96
Kaye Walker
Inorganic Division Manager

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

323-068

Lab Name: CH2M_HILL Contract: MB382

Lab Code: MGM Case No.: MB382_ SAS No.: MB382_ SDG No.: MB382_

Matrix (soil/water): SOIL_ Lab Sample ID: MB382001

Level (low/med): LOW Date Received: 07/16/96

% Solids: 90.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.48	B		F
7440-39-3	Barium	2.2	B		P
7440-43-9	Cadmium	0.73	U		P
7440-47-3	Chromium	2.1	B		P
7439-92-1	Lead	3.7			F
7439-97-6	Mercury	0.03	U		CV
7782-49-2	Selenium	0.28	U		F
7440-22-4	Silver	0.49	U		P

Color Before: BROWN Clarity Before: N/A Texture: SAND

Color After: YELLOW Clarity After: N/A Artifacts:

Comments:

FORM I - IN

ILM02.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

323-068

Lab Name: CH2M_HILL Contract: MB382

Lab Code: MGM Case No.: MB382_ SAS No.: MB382_ SDG No.: MB382_

Matrix (soil/water): WATER Lab Sample ID: TCMB382001

Level (low/med): LOW Date Received: 07/16/96

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	20.9	B		P
7440-39-3	Barium	500			P
7440-43-9	Cadmium	3.4	B		P
7440-47-3	Chromium	5.7	B		P
7439-92-1	Lead	30.2	B		P
7439-97-6	Mercury	0.05	U		CV
7782-49-2	Selenium	29.4	U		P
7440-22-4	Silver	2.8	B	N	P

Color Before: CLEAR Clarity Before: CLEAR Texture: N/A

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:
THESE_DATA_ARE_FOR_TCLP_ANALYTES._THE_"N"_QUALIFIER_INDICATES_POOR_PRESPIKE_RECOVERY.

FORM I - IN

ILMO2.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

323-06B

Lab Name: CH2M_HILL Contract: MB382

Lab Code: MGM Case No.: MB382_ SAS No.: MB382_ SDG No.: MB382_

Matrix (soil/water): WATER Lab Sample ID: MB382002

Level (low/med): LOW Date Received: 07/16/96

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.95	U		F
7440-39-3	Barium	5.0	B		P
7440-43-9	Cadmium	3.3	U		P
7440-47-3	Chromium	2.4	B		P
7439-92-1	Lead	0.75	U		F
7439-97-6	Mercury	0.05	U		CV
7782-49-2	Selenium	1.2	U		F
7440-22-4	Silver	2.2	U		P

Color Before: CLEAR Clarity Before: CLEAR Texture: N/A

Color After: CLEAR Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ILMO2.1

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

323-068S

Lab Name: CH2M_HILL_____ Contract: MB382_____

Lab Code: MGM___ Case No.: MB382_ SAS No.: MB382_ SDG No.: MB382_

Matrix (soil/water): WATER_ Level (low/med): LOW___

% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Arsenic__	75-125_	1129.6000_	_	20.8600	B	1000.00	110.9	_	P_
Barium___	75-125_	2500.5200_	_	500.4200	_	2000.00	100.0	_	P_
Cadmium__	75-125_	525.5100_	_	3.4500	B	500.00	104.4	_	P_
Chromium_	75-125_	517.7800_	_	5.6600	B	500.00	102.4	_	P_
Lead_____	75-125_	1046.8600_	_	30.1900	B	1000.00	101.7	_	P_
Mercury__	75-125_	1.8900_	_	0.0540	U	2.00	94.5	_	CV
Selenium_	75-125_	1211.2200_	_	29.4000	U	1000.00	121.1	_	P_
Silver___	75-125_	372.0700_	_	2.8100	B	500.00	73.9	N	P_

Comments:
THESE_DATA_ARE_FOR_TCLP_ANALYTES.

FORM V (Part 1) - IN ILMO2

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5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

323-068S

Lab Name: CH2M_HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: MB382 SDG No.: MB382

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 90.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Arsenic	75-125	8.2141		0.4768	B	8.83	87.6		F
Barium	75-125	424.8565		2.2384	B	441.50	95.7		P
Cadmium	75-125	11.0199		0.7285	U	11.04	99.8		P
Chromium	75-125	46.6887		2.1170	B	44.15	101.0		P
Lead	75-125	7.8565		3.6556		4.42	95.0		F
Mercury	75-125	1.0123		0.0289	U	1.08	93.7		CV
Selenium	75-125	1.8411		0.2759	U	2.21	83.3		F
Silver	75-125	11.4547		0.4857	U	11.04	103.8		P

Comments:

U.S. EPA - CLP

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

323-068A

Lab Name: CH2M_HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: MB382 SDG No.: MB382

Matrix (soil/water) : WATER Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
Arsenic									NR
Barium									NR
Cadmium									NR
Chromium									NR
Lead									NR
Mercury									NR
Selenium									NR
Silver		485.57		2.81	B	500.0	96.6		P

Comments:
THESE_DATA_ARE_FOR_TCLP_ANALYTES.

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

323-068D

Lab Name: CH2M_HILL_____ Contract: MB382_____

Lab Code: MGM___ Case No.: MB382_ SAS No.: MB382_ SDG No.: MB382_

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		20.8600	B	14.9000	U	200.0		P
Barium	200.0	500.4200		511.6800		2.2		P
Cadmium		3.4500	B	3.3000	U	200.0		P
Chromium		5.6600	B	2.8300	B	66.7		P
Lead		30.1900	B	20.8200	B	36.7		P
Mercury		0.0540	U	0.0540	U			CV
Selenium		29.4000	U	29.4000	U			P
Silver		2.8100	B	2.2000	U	200.0		P

FORM VI - IN

ILMO2.1

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

323-068D

Lab Name: CH2M_HILL_____ Contract: MB382_____

Lab Code: MGM___ Case No.: MB382_ SAS No.: MB382_ SDG No.: MB382_

Matrix (soil/water): SOIL_ Level (low/med): _LOW__

% Solids for Sample: _90.6 % Solids for Duplicate: __90.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		0.4768	B	0.3135	B	41.3		F
Barium		2.2384	B	1.7439	B	24.8		P
Cadmium		0.7285	U	0.7285	U			P
Chromium		2.1170	B	1.8234	B	14.9		P
Lead		3.6556		4.0221		9.5		F
Mercury		0.0289	U	0.0298	U			CV
Selenium		0.2759	U	0.2759	U			F
Silver		0.4857	U	0.4857	U			P

FORM VI - IN

ILMO2.1

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

323-068ED

Lab Name: CH2M_HILL_____ Contract: MB382_____

Lab Code: MGM___ Case No.: MB382_ SAS No.: MB382_ SDG No.: MB382_

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic__		20.8600	B	23.3800	B	11.4_	_	P_
Barium___	200.0_	500.4200	_	569.4400	_	12.9_	_	P_
Cadmium__		3.4500	B	3.3000	U	200.0_	_	P_
Chromium_		5.6600	B	4.2400	B	28.7_	_	P_
Lead_____		30.1900	B	24.6800	B	20.1_	_	P_
Mercury__		0.0540	U	0.0540	U		_	CV
Selenium_		29.4000	U	29.4000	U		_	P_
Silver___		2.8100	B	2.2000	U	200.0_	_	P_

FORM VI - IN

ILMO2.1

U.S. EPA - CLP

9

ICP SERIAL DILUTION

EPA SAMPLE NO.

323-068L

Lab Name: CH2M_HILL Contract: MB382

Lab Code: MGM Case No.: MB382_ SAS No.: MB382_ SDG No.: MB382_

Matrix (soil/water): WATER Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Arsenic	20.86		59.60	U	100.0		P
Barium	500.42		538.88	B	7.7		P
Cadmium	3.45	B	13.20	U	100.0		P
Chromium	5.66	B	10.04	B	77.4		P
Lead	30.19		62.80	U	100.0		P
Mercury							
Selenium	29.40	U	117.60	U			P
Silver	2.81	B	8.80	U	100.0		P

FORM IX - IN

ILMO2.1

U.S. EPA - CLP

9

ICP SERIAL DILUTION

EPA SAMPLE NO.

323-068L

Lab Name: CH2M_HILL Contract: MB382

Lab Code: MGM Case No.: MB382 SAS No.: MB382 SDG No.: MB382

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Arsenic							
Barium	10.14	B	12.40	B	22.3		P
Cadmium	3.30	U	13.20	U			P
Chromium	9.59	B	13.84	B	44.3		P
Lead							
Mercury							
Selenium							
Silver	2.20	U	8.80	U			P

FORM IX - IN

ILM02.1

GENERAL CHEMISTRY

CASE NARRATIVE
GENERAL CHEMISTRY

QAL Lab Reference No./SDG. MB382

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

All holding times were met.

III. METHOD

The method used is cited in the corresponding Form I.

IV. PREPARATION

Sample preparation proceeded normally, if applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Spikes: The initial matrix spike for MB382001 was outside acceptance criteria, therefore a post spike was done. All other acceptance criteria were met.

D. Duplicates: All acceptance criteria were met.

E. Laboratory Control Samples: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Velinda Herbert DATE: 7/30/96
Velinda Herbert
General Organic/Inorganic Chemist

Report of Analytical Results

Client Sample ID: 323-068
Sample Description: COMP
Sample Matrix: Soil

Date Collected: 07/12/96 (Friday)
Date Received: 07/16/96 (Tuesday)

Lab Reference No: MB382
Lab Sample ID: MB382001

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC					
Total Petroleum Hydrocarbons	22.0	mg/Kg	1.8	07/23/96	S3550/9071/418.1

(6486)

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

323-1B

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369002

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 17JUL1801018.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec. _____ Data Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
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23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071796b.b/17Jul1801018.d
Lab Smp Id: MB369002 Client Smp ID: 323-1B
Inj Date : 17-JUL-1996 21:51 Autotune Date: 17-Jul-96 10:51
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 323-1B MB369002
Misc Info :
Comment :
Method : /chem/ms5.i/a071796b.b/8260w5.m
Meth Date : 29-Jul-1996 14:25 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 18
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
* 1 Pentafluorobenzene	168.00	13.753	13.722	(1.000)	1701627	50	
3 Chloromethane	50.00		3.198	Compound Not Detected.			
4 Vinyl chloride	62.00		3.532	Compound Not Detected.			
5 Bromomethane	94.00		4.722	Compound Not Detected.			
6 Chloroethane	64.00		5.047	Compound Not Detected.			
7 Trichlorofluoromethane	101.00		5.794	Compound Not Detected.			
11 1,1-Dichloroethene	96.00		7.555	Compound Not Detected.			
16 Methylene chloride	84.00		9.001	Compound Not Detected.			
19 trans-1,2-Dichloroethene	96.00		9.808	Compound Not Detected.			
21 1,1-Dichloroethane	63.00		11.047	Compound Not Detected.			
31 Chloroform	83.00		13.162	Compound Not Detected.			
33 1,1,1-Trichloroethane	97.00		14.175	Compound Not Detected.			
35 Carbon tetrachloride	117.00		14.775	Compound Not Detected.			
* 36 1,4-Difluorobenzene	114.00	16.025	16.014	(1.000)	2142366	50	
37 1,2-Dichloroethane	62.00		15.217	Compound Not Detected.			
38 Benzene	78.00		15.188	Compound Not Detected.			
39 Trichloroethene	95.00		16.654	Compound Not Detected.			
41 1,2-Dichloropropane	63.00		17.067	Compound Not Detected.			
43 Bromodichloromethane	83.00		17.549	Compound Not Detected.			
45 2-Chloroethylvinyl ether	63.00		18.375	Compound Not Detected.			
46 cis-1,3-Dichloropropene	75.00		18.788	Compound Not Detected.			
* 48 Chlorobenzene-d5	117.00	22.369	22.378	(1.000)	1688135	50	

Rev 8/2/96 WXH 7/29/96

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
49 Toluene	91.00	19.448	19.427	(0.869)	59654	1	~~1 ug~~ below PQL WRH 7/31/96
51 trans-1,3-Dichloropropene	75.00		19.870	Compound Not Detected.			
52 1,1,2-Trichloroethane	83.00		20.145	Compound Not Detected.			
55 Tetrachloroethene	166.00		20.775	Compound Not Detected.			
56 Dibromochloromethane	129.00		21.159	Compound Not Detected.			
58 Chlorobenzene	112.00		22.447	Compound Not Detected.			
60 Ethylbenzene	91.00		22.604	Compound Not Detected.			
66 Bromoform	173.00		24.336	Compound Not Detected.			
68 1,1,2,2-Tetrachloroethane	83.00		24.759	Compound Not Detected.			
* 69 1,4-Dichlorobenzene-d4	152.00	27.327	27.316	(1.000)	842496	50	
$ 91 Dibromofluoromethane	113.00	13.753	13.722	(1.000)	927038	52	52
$ 92 1,2-Dichloroethane-d4	65.00	14.992	14.991	(0.936)	394356	48	48
$ 93 Toluene-d8	98.00	19.271	19.270	(1.203)	2036026	51	51
$ 94 Bromofluorobenzene	174.00	24.887	24.886	(1.113)	834943	50	50

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071796b.b/17Jul1801018.d
Lab Smp Id: MB369002 Client Smp ID: 323-1B
Inj Date : 17-JUL-1996 21:51 Autotune Date: 17-Jul-96 10:51:2
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 323-1B MB369002
Misc Info :
Comment :
Method : /chem/ms5.i/a071796b.b/8260w5.m
Meth Date : 29-Jul-1996 14:25 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 18
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIP_BLANK

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369003

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 18JUL0701007.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec. _____ Date Analyzed: 07/18/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
110-75-8	2-Chloroethylvinyl ether	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-88-3	Toluene	2	J
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U

mp

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIP_BLANK

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369003

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 18JUL0701007.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec. _____ Data Analyzed: 07/18/96

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071896a.b/18Jul0701007.d
Lab Smp Id: MB369003 Client Smp ID: TRIP_BLANK
Inj Date : 18-JUL-1996 18:14 Autotune Date: 18-Jul-96 11:10
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : TRIP_BLANK MB369003
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m
Meth Date : 29-Jul-1996 14:44 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 7
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
* 1 Pentafluorobenzene	168.00	13.752	13.756	(1.000)	1762989	50	
3 Chloromethane	50.00		3.221	Compound Not Detected.			
4 Vinyl chloride	62.00		3.556	Compound Not Detected.			
5 Bromomethane	94.00		4.765	Compound Not Detected.			
6 Chloroethane	64.00		5.080	Compound Not Detected.			
7 Trichlorofluoromethane	101.00		5.828	Compound Not Detected.			
11 1,1-Dichloroethene	96.00		7.598	Compound Not Detected.			
16 Methylene chloride	84.00		9.034	Compound Not Detected.			
19 trans-1,2-Dichloroethene	96.00		9.841	Compound Not Detected.			
21 1,1-Dichloroethane	63.00		11.070	Compound Not Detected.			
31 Chloroform	83.00		13.175	Compound Not Detected.			
33 1,1,1-Trichloroethane	97.00		14.218	Compound Not Detected.			
35 Carbon tetrachloride	117.00		14.789	Compound Not Detected.			
* 36 1,4-Difluorobenzene	114.00	16.034	16.038	(1.000)	2221070	50	
37 1,2-Dichloroethane	62.00		15.221	Compound Not Detected.			
38 Benzene	78.00		15.212	Compound Not Detected.			
39 Trichloroethene	95.00		16.667	Compound Not Detected.			
41 1,2-Dichloropropane	63.00		17.080	Compound Not Detected.			
43 Bromodichloromethane	83.00		17.562	Compound Not Detected.			
45 2-Chloroethylvinyl ether	63.00		18.379	Compound Not Detected.			
46 cis-1,3-Dichloropropene	75.00		18.802	Compound Not Detected.			
48 Chlorobenzene-d5	117.00	22.379	22.372	(1.000)	1694006	50	

000020

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
49 Toluene	91.00	19.438	19.431	(0.869)	89828	2	2(a)
51 trans-1,3-Dichloropropene	75.00		19.874	Compound Not Detected.			
52 1,1,2-Trichloroethane	83.00		20.169	Compound Not Detected.			
55 Tetrachloroethene	166.00		20.779	Compound Not Detected.			
56 Dibromochloromethane	129.00		21.162	Compound Not Detected.			
58 Chlorobenzene	112.00		22.461	Compound Not Detected.			
60 Ethylbenzene	91.00		22.608	Compound Not Detected.			
66 Bromoform	173.00		24.330	Compound Not Detected.			
68 1,1,2,2-Tetrachloroethane	83.00		24.753	Compound Not Detected.			
* 69 1,4-Dichlorobenzene-d4	152.00	27.326	27.320	(1.000)	849274	50	
$ 91 Dibromofluoromethane	113.00	13.762	13.766	(1.001)	907591	49	49
$ 92 1,2-Dichloroethane-d4	65.00	15.021	15.005	(0.937)	361691	42	42
$ 93 Toluene-d8	98.00	19.280	19.274	(1.202)	1913230	46	46
$ 94 Bromofluorobenzene	174.00	24.897	24.890	(1.113)	782259	47	47

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071896a.b/18Jul0701007.d
Lab Smp Id: MB369003 Client Smp ID: TRIP_BLANK
Inj Date : 18-JUL-1996 18:14 Autotune Date: 18-Jul-96 11:10:3
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : TRIP_BLANK MB369003
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m
Meth Date : 29-Jul-1996 14:44 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 7
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0Q

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: X07176B2

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 17JUL0601006.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec. _____ Date Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
110-75-8	2-Chloroethylvinyl ether	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK0Q

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: X07176B2

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 17JUL0601006.D

Level: (low/med) LOW Date Received: 07/17/96

% Moisture: not dec. _____ Data Analyzed: 07/17/96

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071796b.b/17Jul0601006.d
Lab Smp Id: X07176B2 Client Smp ID: VBLK0Q
Inj Date : 17-JUL-1996 13:36 Autotune Date: 17-Jul-96 10:51
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : VBLK0Q X07176B2
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071796b.b/8260w5.m
Meth Date : 29-Jul-1996 14:40 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 6 QC Sample: BLANK
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
* 1 Pentafluorobenzene	168.00	13.753	13.722	(1.000)	1708206	50	
3 Chloromethane	50.00		3.198	Compound Not Detected.			
4 Vinyl chloride	62.00		3.532	Compound Not Detected.			
5 Bromomethane	94.00		4.722	Compound Not Detected.			
6 Chloroethane	64.00		5.047	Compound Not Detected.			
7 Trichlorofluoromethane	101.00		5.794	Compound Not Detected.			
11 1,1-Dichloroethene	96.00		7.555	Compound Not Detected.			
16 Methylene chloride	84.00		9.001	Compound Not Detected.			
19 trans-1,2-Dichloroethene	96.00		9.808	Compound Not Detected.			
21 1,1-Dichloroethane	63.00		11.047	Compound Not Detected.			
31 Chloroform	83.00		13.162	Compound Not Detected.			
33 1,1,1-Trichloroethane	97.00		14.175	Compound Not Detected.			
35 Carbon tetrachloride	117.00		14.775	Compound Not Detected.			
* 36 1,4-Difluorobenzene	114.00	16.045	16.014	(1.000)	2137991	50	
37 1,2-Dichloroethane	62.00		15.217	Compound Not Detected.			
38 Benzene	78.00		15.188	Compound Not Detected.			
39 Trichloroethene	95.00		16.654	Compound Not Detected.			
41 1,2-Dichloropropane	63.00		17.067	Compound Not Detected.			
43 Bromodichloromethane	83.00		17.549	Compound Not Detected.			
45 2-Chloroethylvinyl ether	63.00		18.375	Compound Not Detected.			
46 cis-1,3-Dichloropropene	75.00		18.788	Compound Not Detected.			
* 48 Chlorobenzene-d5	117.00	22.379	22.378	(1.000)	1678117	50	
49 Toluene	91.00		19.427	Compound Not Detected.			

fw mp 8/2/96
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Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
51 trans-1,3-Dichloropropene	75.00		19.870		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.145		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.775		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.159		Compound Not Detected.		
58 Chlorobenzene	112.00		22.447		Compound Not Detected.		
60 Ethylbenzene	91.00		22.604		Compound Not Detected.		
66 Bromoform	173.00		24.336		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		24.759		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.327	27.316	(1.000)	839469	50	
$ 91 Dibromofluoromethane	113.00	13.763	13.722	(1.001)	909124	51	51
$ 92 1,2-Dichloroethane-d4	65.00	15.002	14.991	(0.935)	391062	47	47
$ 93 Toluene-d8	98.00	19.271	19.270	(1.201)	1994703	50	50
$ 94 Bromofluorobenzene	174.00	24.897	24.886	(1.113)	808563	49	49

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071796b.b/17Jul0601006.d
Lab Smp Id: X07176B2 Client Smp ID: VBLK0Q
Inj Date : 17-JUL-1996 13:36 Autotune Date: 17-Jul-96 10:51:2
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : VBLK0Q X07176B2
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071796b.b/8260w5.m
Meth Date : 29-Jul-1996 14:40 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 6 QC Sample: BLANK
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0S

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: X07186B1

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 18JUL0501005.D

Level: (low/med) LOW Date Received: 07/18/96

% Moisture: not dec. _____ Date Analyzed: 07/18/96

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
110-75-8	2-Chloroethylvinyl ether	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK0S

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: X07186B1

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 18JUL0501005.D

Level: (low/med) LOW Date Received: 07/18/96

% Moisture: not dec. _____ Data Analyzed: 07/18/96

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071896a.b/18Jul0501005.d
Lab Smp Id: X07186B1 Client Smp ID: VBLK0S
Inj Date : 18-JUL-1996 15:57 Autotune Date: 18-Jul-96 11:10
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : VBLK0S X07186B1
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m
Meth Date : 29-Jul-1996 14:44 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 5 QC Sample: BLANK
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
* 1	Pentafluorobenzene	168.00	13.751	13.756	(1.000)	1705825	50	
3	Chloromethane	50.00		3.221	Compound Not Detected.			
4	Vinyl chloride	62.00		3.556	Compound Not Detected.			
5	Bromomethane	94.00		4.765	Compound Not Detected.			
6	Chloroethane	64.00		5.080	Compound Not Detected.			
7	Trichlorofluoromethane	101.00		5.828	Compound Not Detected.			
11	1,1-Dichloroethene	96.00		7.598	Compound Not Detected.			
16	Methylene chloride	84.00		9.034	Compound Not Detected.			
19	trans-1,2-Dichloroethene	96.00		9.841	Compound Not Detected.			
21	1,1-Dichloroethane	63.00		11.070	Compound Not Detected.			
31	Chloroform	83.00		13.175	Compound Not Detected.			
33	1,1,1-Trichloroethane	97.00		14.218	Compound Not Detected.			
35	Carbon tetrachloride	117.00		14.789	Compound Not Detected.			
* 36	1,4-Difluorobenzene	114.00	16.033	16.038	(1.000)	2161330	50	
37	1,2-Dichloroethane	62.00		15.221	Compound Not Detected.			
38	Benzene	78.00		15.212	Compound Not Detected.			
39	Trichloroethene	95.00		16.667	Compound Not Detected.			
41	1,2-Dichloropropane	63.00		17.080	Compound Not Detected.			
43	Bromodichloromethane	83.00		17.562	Compound Not Detected.			
45	2-Chloroethylvinyl ether	63.00		18.379	Compound Not Detected.			
46	cis-1,3-Dichloropropene	75.00		18.802	Compound Not Detected.			
* 48	Chlorobenzene-d5	117.00	22.378	22.372	(1.000)	1679706	50	
49	Toluene	91.00		19.431	Compound Not Detected.			

Rev MTP 8/2/96
WLH 7/29/96

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Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
51 trans-1,3-Dichloropropene	75.00		19.874		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.169		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.779		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.162		Compound Not Detected.		
58 Chlorobenzene	112.00		22.461		Compound Not Detected.		
60 Ethylbenzene	91.00		22.608		Compound Not Detected.		
66 Bromoform	173.00		24.330		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		24.753		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.325	27.320	(1.000)	848427	50	
$ 91 Dibromofluoromethane	113.00	13.761	13.766	(1.001)	884013	50	50
$ 92 1,2-Dichloroethane-d4	65.00	15.000	15.005	(0.936)	353517	42	42
$ 93 Toluene-d8	98.00	19.279	19.274	(1.202)	1924540	48	48
$ 94 Bromofluorobenzene	174.00	24.896	24.890	(1.113)	793008	48	48

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071896a.b/18Jul0501005.d
Lab Smp Id: X07186B1 Client Smp ID: VBLK0S
Inj Date : 18-JUL-1996 15:57 Autotune Date: 18-Jul-96 11:10:3
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : VBLK0S X07186B1
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m
Meth Date : 29-Jul-1996 14:44 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 5 QC Sample: BLANK
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

GC/MS SEMIVOLATILE ORGANICS

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

QAL Lab Reference No./SDG. MB369

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: SW-846 3520A
Cleanup: N/A
Analysis: SW-846 8270A

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: Project QC was neither requested nor designated for this batch. Therefore, spike results are neither included nor referenced with this report. All internal QC requirements were met.

E. Samples: Sample analysis proceeded normally.

F. Other: Please note that the Form 1's reflect the specified target list and that Azobenzene is reported as 1,2-Diphenylhydrazine.

A summary of the most current applicable method detection limits (MDLs) immediately follows the case narrative.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Monty Rice for DATE: 8/5/96
Debra A. Vergin
Chemist

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH[1]
MB369001	323-1	WATER	07/12/96	07/16/96	07/25/96	N/A
MB369002	323-1B	WATER	07/12/96	07/16/96	07/25/96	N/A
C07166B1	SBLK7S	WATER	N/A	07/16/96	07/24/96	N/A

[1] Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER

Analytical Method: SW8270 Extraction Method: SW3520

	MDL ug/L
Acenaphthene	0.43
Acenaphthylene	0.41
Acetophenone	0.47
2-Acetylaminofluorene	0.68
4-Aminobiphenyl	0.31
Aniline	0.70
Anthracene	0.46
Aramite	1.28
Aramite(DUP)	0.54
Benzidine	2.78
Benzo(a)anthracene	0.34
Benzo(a)pyrene	0.31
Benzo(b)fluoranthene	0.68
Benzo(g,h,i)perylene	0.72
Benzo(k)fluoranthene	0.65
Benzoic acid	10.32
Benzyl alcohol	0.51
bis(2-Chloroethoxy)methane	0.60
bis(2-Chloroethyl)ether	0.61
bis(2-Ethylhexyl)phthalate	4.51
4-Bromophenyl-phenylether	0.56
Butylbenzylphthalate	1.25
Carbazole	0.56
4-Chloro-3-Methylphenol	2.28
4-Chloroaniline	0.47
1-Chloronaphthalene	0.68
2-Chloronaphthalene	0.53
2-Chlorophenol	0.78
4-Chlorophenyl-phenylether	0.35
Chrysene	0.36
Di-n-butylphthalate	1.24
Di-n-octylphthalate	1.45
Dibenz(a,h)anthracene	0.54
Dibenzofuran	0.43
1,2-Dichlorobenzene	0.75
1,3-Dichlorobenzene	0.73
1,4-Dichlorobenzene	0.79
3,3'-Dichlorobenzidine	0.67
2,4-Dichlorophenol	0.54
2,6-Dichlorophenol	0.62
Diethylphthalate	1.61
7,12-Dimethylbenz(a)anthracen	0.36
3,3'-Dimethylbenzidine	4.96

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER

Analytical Method: SW8270 Extraction Method: SW3520

	MDL ug/L
2,4-Dimethylphenol	0.44
Dimethylphthalate	1.69
4,6-Dinitro-2-methylphenol	1.36
1,3-Dinitrobenzene	0.85
2,4-Dinitrophenol	1.91
2,4-Dinitrotoluene	0.54
2,6-Dinitrotoluene	0.53
1,2-Diphenylhydrazine	0.42
Ethyl methanesulfonate	0.42
Fluoranthene	0.81
Fluorene	0.53
Hexachlorobenzene	1.10
Hexachlorobutadiene	0.90
Hexachlorocyclopentadiene	1.98
Hexachloroethane	0.79
Hexachlorophene	131.38
Hexachloropropene	1.81
Indeno(1,2,3-cd)pyrene	0.46
Isophorone	0.61
Isosafrole	0.39
Methapyrilene	6.24
Methyl methanesulfonate	0.42
3-Methylcholanthrene	0.50
2-Methylnaphthalene	0.62
2-Methylphenol	0.42
3 & 4-Methylphenol	1.14
N-Nitroso-di-n-butylamine	0.41
N-Nitroso-di-n-propylamine	0.72
N-Nitrosodiethylamine	0.31
N-Nitrosodimethylamine	0.60
N-Nitrosodiphenylamine (1)	0.95
N-Nitrosomethylethylamine	0.43
N-Nitrosomorpholine	0.65
N-Nitrosopiperidine	0.40
N-Nitrosopyrrolidine	0.48
Naphthalene	0.68
1,4-Naphthoquinone	123.50
1-Naphthylamine	1.38
2-Naphthylamine	0.81
5-Nitro-o-toluidine	0.64
2-Nitroaniline	1.34
3-Nitroaniline	1.03
4-Nitroaniline	1.39

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8270 Extraction Method: SW3520

	MDL ug/L
Nitrobenzene	0.57
2-Nitrophenol	1.23
4-Nitrophenol	1.44
4-Nitroquinoline-1-oxide	2.02
o-Toluidine	0.30
2,2'-Oxybis(1-chloropropane)	0.51
p-Dimethylaminoazobenzene	0.62
Pentachlorobenzene	0.54
Pentachloronitrobenzene	0.28
Pentachlorophenol	2.51
Phenacetin	0.83
Phenanthrene	0.42
Phenol	0.53
Phenyl-tert-butylamine	25.65
1,4-Phenylenediamine	23.31
2-Picoline	1.03
Pronamide	0.65
Pyrene	0.43
Pyridine	0.87
Safrole	0.50
1,2,4,5-Tetrachlorobenzene	0.79
2,3,4,6-Tetrachlorophenol	1.01
1,2,4-Trichlorobenzene	0.72
2,4,5-Trichlorophenol	0.70
2,4,6-Trichlorophenol	0.66
1,3,5-Trinitrobenzene	0.65

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-1

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369001

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006697.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-1

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369001

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006697.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (3)	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
92-87-5	Benzidine	50	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-1

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369001

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006697.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 19

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	5.395	6	J
2. 822-67-3	2-Cyclohexen-1-ol	5.622	4	NJ
3.	Unknown	6.509	5	J
4. 527-53-7	Benzene, 1,2,3,5-tetramethyl	7.733	4	NJ
5. 4706-90-5	Benzene, 1,3-dimethyl-5-(1-m	7.908	4	NJ
6.	Unknown	8.194	4	J
7.	Unknown	9.015	6	J
8. 16021-08-2	2(1H)-Naphthalenone, octahyd	9.836	3	NJ
9.	Unknown	10.180	3	J
10.	Unknown	10.217	3	J
11. 480-63-7	Benzoic acid, 2,4,6-trimethy	10.803	4	NJ
12.	Unknown	11.807	2	J
13. 51-44-5	Benzoic acid, 3,4-dichloro-	11.983	21	NJ
14.	Unknown	12.496	4	J
15.	Unknown	12.708	6	J
16.	Unknown	16.350	3	J
17. 57-10-3	Hexadecanoic acid	16.489	5	NJ
18. 19438-60-9	1,3-Isobenzofurandione, hexa	16.760	9	NJ
19.	Unknown	19.867	3	J
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072596a.b/h0006697.d
Lab Smp Id: MB369001 Client Smp ID: 323-1
Inj Date : 25-JUL-1996 12:30
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB369001 323-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 05-Aug-1996 14:10 mjohnson Quant Type: ISTD
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 6
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.468	5.471	(0.811)	241035	150	75
$	9 Phenol-d5	99.00	6.289	6.291	(0.933)	317923	160	79
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.743	6.753	(1.000)	40370	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.454	7.464	(0.876)	123379	83	42
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.509	8.519	(1.000)	148815	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.436	10.453	(0.875)	200691	73	36
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

MCJ 8/5/96

000120

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
	66 Acenaphthylene	152.00	Compound Not Detected.					
*	68 Acenaphthene-d10	164.00	11.931	11.941	(1.000)	98737	40	
	69 Acenaphthene	154.00	Compound Not Detected.					
	70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
	71 4-Nitrophenol	65.00	Compound Not Detected.					
	74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
	78 Diethylphthalate	149.00	Compound Not Detected.					
	79 Fluorene	166.00	Compound Not Detected.					
	80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
	83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
	84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
	85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$	86 2,4,6-Tribromophenol	329.65	13.734	13.744	(1.151)	76934	160	80
	89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
	90 Hexachlorobenzene	284.00	Compound Not Detected.					
	92 Pentachlorophenol	266.00	Compound Not Detected.					
*	95 Phenanthrene-d10	188.00	15.331	15.348	(1.000)	143481	40	
	96 Phenanthrene	178.00	Compound Not Detected.					
	97 Anthracene	178.00	Compound Not Detected.					
	99 Di-n-butylphthalate	149.00	Compound Not Detected.					
	102 Fluoranthene	202.00	Compound Not Detected.					
	103 Benzidine	184.00	Compound Not Detected.					
	104 Pyrene	202.00	Compound Not Detected.					
$	106 Terphenyl-d14	244.00	19.186	19.203	(0.879)	212500	72	36
	110 Butylbenzylphthalate	149.00	Compound Not Detected.					
	112 Benzo(a)anthracene	228.00	Compound Not Detected.					
	113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
*	114 Chrysene-d12	240.00	21.824	21.848	(1.000)	100379	40	
	115 Chrysene	228.00	Compound Not Detected.					
	116 bis(2-Ethylhexyl)phthalate	149.00	Compound Not Detected.					
	117 Di-n-octylphthalate	149.00	Compound Not Detected.					
	118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
	120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
	122 Benzo(a)pyrene	252.00	Compound Not Detected.					
*	123 Perylene-d12	264.00	25.297	25.329	(1.000)	96327	40	
	125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
	126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
	127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072596a.b/h0006697.d
Lab Smp Id: MB369001 Client Smp ID: 323-1
Inj Date : 25-JUL-1996 12:30
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB369001 323-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 31-Jul-1996 16:11 mjohnson Quant Type: ISTD
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 6
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.468	5.471	(0.811)	241035	150	75
$	9 Phenol-d5	99.00	6.289	6.291	(0.933)	317923	160	79
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.743	6.753	(1.000)	40370	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.454	7.464	(0.876)	123379	83	42
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.509	8.519	(1.000)	148815	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.436	10.453	(0.875)	200691	73	36
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					
	65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					

Per MTP 8/2/96 MDJ 8/

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	66 Acenaphthylene	152.00	Compound Not Detected.					
*	68 Acenaphthene-d10	164.00	11.931	11.941	(1.000)	98737	40	
	69 Acenaphthene	154.00	Compound Not Detected.					
	70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
	71 4-Nitrophenol	65.00	Compound Not Detected.					
	74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
	78 Diethylphthalate	149.00	Compound Not Detected.					
	79 Fluorene	166.00	Compound Not Detected.					
	80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
	83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
	84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
	85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$	86 2,4,6-Tribromophenol	329.65	13.734	13.744	(1.151)	76934	160	80(A)
	89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
	90 Hexachlorobenzene	284.00	Compound Not Detected.					
	92 Pentachlorophenol	266.00	Compound Not Detected.					
*	95 Phenanthrene-d10	188.00	15.331	15.348	(1.000)	143481	40	
	96 Phenanthrene	178.00	Compound Not Detected.					
	97 Anthracene	178.00	Compound Not Detected.					
	99 Di-n-butylphthalate	149.00	Compound Not Detected.					
	102 Fluoranthene	202.00	Compound Not Detected.					
	103 Benzidine	184.00	Compound Not Detected.					
	104 Pyrene	202.00	Compound Not Detected.					
$	106 Terphenyl-d14	244.00	19.186	19.203	(0.879)	212500	72	36
	110 Butylbenzylphthalate	149.00	Compound Not Detected.					
	112 Benzo(a)anthracene	228.00	Compound Not Detected.					
	113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
*	114 Chrysene-d12	240.00	21.824	21.848	(1.000)	100379	40	
	115 Chrysene	228.00	Compound Not Detected.					
	116 bis(2-Ethylhexyl)phthalate	149.00	Compound Not Detected.					
	117 Di-n-octylphthalate	149.00	Compound Not Detected.					
	118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
	120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
	122 Benzo(a)pyrene	252.00	Compound Not Detected.					
*	123 Perylene-d12	264.00	25.297	25.329	(1.000)	96327	40	
	125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
	126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
	127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072596a.b/h0006697.d
Lab Smp Id: MB369001 Client Smp ID: 323-1
Inj Date : 25-JUL-1996 12:30
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB369001 323-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 05-Aug-1996 10:38 mjohnson
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 6
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
* 16 1,4-Dichlorobenzene-d4	6.743	256429	40.000
* 42 Naphthalene-d8	8.509	415362	40.000
* 68 Acenaphthene-d10	11.931	682824	40.000
* 95 Phenanthrene-d10	15.331	468822	40.000
* 114 Chrysene-d12	21.824	402596	40.000

		CONCENTRATIONS			QUANT		
RT	AREA	ON-COL(NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	CPND #
Unknown				CAS #:			
5.395	83615	13	6	0		0	16
2-Cyclohexen-1-ol				CAS #: 822-67-3			
5.622	49148	8	4	87	NBS75K.l	1277	16
Unknown				CAS #:			
6.509	64245	10	5	0		0	16
Benzene, 1,2,3,5-tetramethyl-				CAS #: 527-53-7			
7.733	77609	7	4	90	NBS75K.l	6220	42

RT	AREA	CONCENTRATIONS ON-COL(NG)	FINAL(ug/L)	QUAL	QUANT LIBRARY	LIB ENTRY	CPND #
Benzene, 1,3-dimethyl-5-(1-methylethyl)-					CAS #: 4706-90-5		
7.908	75788	7	4	30	NBS75K.l	9379	42
Unknown					CAS #:		
8.194	81198	8	4	0		0	42
Unknown					CAS #:		
9.015	122232	12	6	0		0	42
2(1H)-Naphthalenone, octahydro-, trans-					CAS #: 16021-08-2		
9.836	69187	7	3	94	NBS75K.l	66956	42
Unknown					CAS #:		
10.180	63457	6	3	0		0	42
Unknown					CAS #:		
10.217	63972	6	3	0		0	42
Benzoic acid, 2,4,6-trimethyl-					CAS #: 480-63-7		
10.803	151431	9	4	62	NBS75K.l	67833	68
Unknown					CAS #:		
11.807	68290	4	2	0		0	68
Benzoic acid, 3,4-dichloro-					CAS #: 51-44-5		
11.983	723551	42	21	95	NBS75K.l	20163	68
Unknown					CAS #:		
12.496	136746	8	4	0		0	68
Unknown					CAS #:		
12.708	192210	11	6	0		0	68
Unknown					CAS #:		
16.350	75012	6	3	0		0	95
Hexadecanoic acid					CAS #: 57-10-3		
16.489	122417	10	5	92	NBS75K.l	35186	95
1,3-Isobenzofurandione, hexahydro-5-meth					CAS #: 19438-60-9		
16.760	217997	18	9	50	NBS75K.l	14469	95(L)
Unknown					CAS #:		
19.867	63467	6	3	0		0	114

QC Flag Legend

L - Operator selected an alternate library search match.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-1B

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006698.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-1B

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006698.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (3)	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
92-87-5	Benzidine	50	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

323-1B

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: MB369002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006698.D

Level: (low/med) LOW Date Received: 07/13/96

% Moisture: not dec._____ dec._____ Date Extracted:07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown Alcohol	5.198	4	J
2.		Unknown	5.352	2	J
3.		Unknown	5.396	3	J
4.		Unknown Alcohol	5.711	6	JB
5.		Unknown	7.404	6	J
6.	13679-75-9	1-(2-Thienyl)-1-propanone	8.400	5	NJ
7.	95-16-9	Benzothiazole	8.965	3	NJ
8.	121-33-5	Vanillin	10.753	2	NJ
9.		Unknown	12.504	3	J
10.		Unknown	16.395	5	J
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

FORM I SV-TIC

SW846 mtp

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072596a.b/h0006698.d
Lab Smp Id: MB369002 Client Smp ID: 323-1B
Inj Date : 25-JUL-1996 13:11
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB369002 323-1B
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 05-Aug-1996 14:10 mjohnson Quant Type: ISTD
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 7
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.462	5.471	(0.810)	231767	140	68
$	9 Phenol-d5	99.00	6.283	6.291	(0.932)	289075	140	68
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.744	6.753	(1.000)	42747	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.455	7.464	(0.877)	116266	79	40
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.503	8.519	(1.000)	147561	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.438	10.453	(0.875)	189198	85	42
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

MEJ8/F

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
	66 Acenaphthylene	152.00	Compound Not Detected.					
*	68 Acenaphthene-d10	164.00	11.925	11.941	(1.000)	79587	40	
	69 Acenaphthene	154.00	Compound Not Detected.					
	70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
	71 4-Nitrophenol	65.00	Compound Not Detected.					
	74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
	78 Diethylphthalate	149.00	Compound Not Detected.					
	79 Fluorene	166.00	Compound Not Detected.					
	80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
	83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
	84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
	85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$	86 2,4,6-Tribromophenol	329.65	13.728	13.744	(1.151)	58326	150	75
	89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
	90 Hexachlorobenzene	284.00	Compound Not Detected.					
	92 Pentachlorophenol	266.00	Compound Not Detected.					
*	95 Phenanthrene-d10	188.00	15.325	15.348	(1.000)	112931	40	
	96 Phenanthrene	178.00	Compound Not Detected.					
	97 Anthracene	178.00	Compound Not Detected.					
	99 Di-n-butylphthalate	149.00	Compound Not Detected.					
	102 Fluoranthene	202.00	Compound Not Detected.					
	103 Benzidine	184.00	Compound Not Detected.					
	104 Pyrene	202.00	Compound Not Detected.					
$	106 Terphenyl-d14	244.00	19.187	19.203	(0.879)	205880	82	41
	110 Butylbenzylphthalate	149.00	Compound Not Detected.					
	112 Benzo(a)anthracene	228.00	Compound Not Detected.					
	113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
*	114 Chrysene-d12	240.00	21.825	21.848	(1.000)	84981	40	
	115 Chrysene	228.00	Compound Not Detected.					
	116 bis(2-Ethylhexyl)phthalate	149.00	Compound Not Detected.					
	117 Di-n-octylphthalate	149.00	Compound Not Detected.					
	118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
	120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
	122 Benzo(a)pyrene	252.00	Compound Not Detected.					
*	123 Perylene-d12	264.00	25.298	25.329	(1.000)	82681	40	
	125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
	126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
	127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072596a.b/h0006698.d
Lab Smp Id: MB369002 Client Smp ID: 323-1B
Inj Date : 25-JUL-1996 13:11
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB369002 323-1B
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 31-Jul-1996 16:11 mjohnson Quant Type: ISTD
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 7
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.462	5.471	(0.810)	231767	140	68
$	9 Phenol-d5	99.00	6.283	6.291	(0.932)	289075	140	68
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.744	6.753	(1.000)	42747	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.455	7.464	(0.877)	116266	79	40
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.503	8.519	(1.000)	147561	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.438	10.453	(0.875)	189198	85	42
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					
	65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					

Rev MTP 8/ MEB

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
66 Acenaphthylene	152.00	Compound Not Detected.					
* 68 Acenaphthene-d10	164.00	11.925	11.941	(1.000)	79587	40	
69 Acenaphthene	154.00	Compound Not Detected.					
70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
71 4-Nitrophenol	65.00	Compound Not Detected.					
74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
78 Diethylphthalate	149.00	Compound Not Detected.					
79 Fluorene	166.00	Compound Not Detected.					
80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$ 86 2,4,6-Tribromophenol	329.65	13.728	13.744	(1.151)	58326	150	75
89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
90 Hexachlorobenzene	284.00	Compound Not Detected.					
92 Pentachlorophenol	266.00	Compound Not Detected.					
* 95 Phenanthrene-d10	188.00	15.325	15.348	(1.000)	112931	40	
96 Phenanthrene	178.00	Compound Not Detected.					
97 Anthracene	178.00	Compound Not Detected.					
99 Di-n-butylphthalate	149.00	Compound Not Detected.					
102 Fluoranthene	202.00	Compound Not Detected.					
103 Benzidine	184.00	Compound Not Detected.					
104 Pyrene	202.00	Compound Not Detected.					
$ 106 Terphenyl-d14	244.00	19.187	19.203	(0.879)	205880	82	41
110 Butylbenzylphthalate	149.00	Compound Not Detected.					
112 Benzo(a)anthracene	228.00	Compound Not Detected.					
113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
* 114 Chrysene-d12	240.00	21.825	21.848	(1.000)	84981	40	
115 Chrysene	228.00	Compound Not Detected.					
116 bis(2-Ethylhexyl)phthalate	149.00	Compound Not Detected.					
117 Di-n-octylphthalate	149.00	Compound Not Detected.					
118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
122 Benzo(a)pyrene	252.00	Compound Not Detected.					
* 123 Perylene-d12	264.00	25.298	25.329	(1.000)	82681	40	
125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072596a.b/h0006698.d
Lab Smp Id: MB369002 Client Smp ID: 323-1B
Inj Date : 25-JUL-1996 13:11
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB369002 323-1B
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 31-Jul-1996 16:11 mjohnson
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 7
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
* 16 1,4-Dichlorobenzene-d4	6.744	286793	40.000
* 42 Naphthalene-d8	8.503	338227	40.000
* 68 Acenaphthene-d10	11.925	352925	40.000
* 95 Phenanthrene-d10	15.325	329168	40.000

RT	AREA	CONCENTRATIONS ON-COL(NG)	FINAL(ug/L)	QUAL	QUANT LIBRARY	LIB ENTRY	CPND #
Unknown Alcohol					CAS #:		
5.198	62206	9	4	0		0	16
Unknown ~~Alcohol~~ MTP 8/5/96					CAS #:		
5.352	32574	4	2	0		0	16
Unknown					CAS #:		
5.396	40165	6	3	0		0	16
Unknown Alcohol					CAS #:		
5.711	93597	13	6	0		0	16

RT	AREA	CONCENTRATIONS ON-COL(NG)	FINAL(ug/L)	QUAL	QUANT LIBRARY	LIB ENTRY	CPND #
Unknown					CAS #:		
7.404	79843	11	6	0		0	16
1-(2-Thienyl)-1-propanone					CAS #: 13679-75-9		
8.400	78235	9	5	93	NBS75K.l	7304	42
Benzothiazole					CAS #: 95-16-9		
8.965	47188	6	3	97	NBS75K.l	6263	42
Vanillin					CAS #: 121-33-5		
10.753	39663	4	2	97	NBS75K.l	66916	68
Unknown					CAS #:		
12.504	47422	5	3	0		0	68
Unknown					CAS #:		
16.395	76871	9	5	0		0	95

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK7S

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: C07166B1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006675.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/24/96

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-oxybis(1-Chloroprop_(1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK7S

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: C07166B1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006675.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/24/96

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (3)	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
92-87-5	Benzidine	50	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

mrl

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK7S

Lab Name: CH2M HILL Contract: MB369

Lab Code: MGM Case No.: MB369 SAS No.: SDG No.: MB369

Matrix: (soil/water) WATER Lab Sample ID: C07166B1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: H0006675.D

Level: (low/med) LOW Date Received: 07/16/96

% Moisture: not dec._____ dec._____ Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/24/96

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	123-42-2	2-Pentanone, 4-hydroxy-4-met	5.257	4	NJA
2.		Unknown Alcohol	5.792	3	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072496a.b/h0006675.d
Lab Smp Id: C07166B1 Client Smp ID: SBLK7S
Inj Date : 24-JUL-1996 10:15
Operator : mjohnson Inst ID: ms3.i
Smp Info : C07166B1 SBLK7S
Misc Info :
Comment :
Method : /chem/ms3.i/h072496a.b/SV8270.m
Meth Date : 05-Aug-1996 09:23 mjohnson Quant Type: ISTD
Cal Date : 24-JUL-1996 08:55 Cal File: h0006673.d
Als bottle: 4 QC Sample: BLANK
Dil Factor: 1.000
Integrator: HP RTE Compound Sublist: brown&root.sub
Target Version: 3.10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
	2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
$	6 2-Fluorophenol	112.00	5.543	5.550	(0.810)	263683	150	74
$	9 Phenol-d5	99.00	6.371	6.378	(0.931)	325622	140	71
	10 Phenol	94.00	Compound Not Detected.					
	12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
	14 2-Chlorophenol	128.00	Compound Not Detected.					
	15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
*	16 1,4-Dichlorobenzene-d4	152.00	6.840	6.839	(1.000)	46289	40	(Q)
	17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
	20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
	22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
	26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
	30 Hexachloroethane	117.00	Compound Not Detected.					
$	31 Nitrobenzene-d5	82.00	7.558	7.565	(0.876)	130022	88	44
	32 Nitrobenzene	77.00	Compound Not Detected.					
	34 Isophorone	82.00	Compound Not Detected.					
	35 2-Nitrophenol	139.00	Compound Not Detected.					
	36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
	38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
	39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
	41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
*	42 Naphthalene-d8	136.00	8.627	8.635	(1.000)	163599	40	
	43 Naphthalene	128.00	Compound Not Detected.					
	47 Hexachlorobutadiene	225.00	Compound Not Detected.					
	50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
	55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
$	57 2-Fluorobiphenyl	172.00	10.577	10.576	(0.876)	221129	99	50
	59 2-Chloronaphthalene	162.00	Compound Not Detected.					
	63 Dimethylphthalate	163.00	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug/L)
65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					
66 Acenaphthylene	152.00	Compound Not Detected.					
* 68 Acenaphthene-d10	164.00	12.072	12.079	(1.000)	88717	40	
69 Acenaphthene	154.00	Compound Not Detected.					
70 2,4-Dinitrophenol	184.00	Compound Not Detected.					
71 4-Nitrophenol	65.00	Compound Not Detected.					
74 2,4-Dinitrotoluene	165.00	Compound Not Detected.					
78 Diethylphthalate	149.00	Compound Not Detected.					
79 Fluorene	166.00	Compound Not Detected.					
80 4-Chlorophenyl-phenylether	204.00	Compound Not Detected.					
83 4,6-Dinitro-2-methylphenol	198.00	Compound Not Detected.					
84 N-Nitrosodiphenylamine (1)	169.00	Compound Not Detected.					
85 1,2-Diphenylhydrazine	77.00	Compound Not Detected.					
$ 86 2,4,6-Tribromophenol	329.65	13.881	13.889	(1.150)	67761	150	76
89 4-Bromophenyl-phenylether	248.00	Compound Not Detected.					
90 Hexachlorobenzene	284.00	Compound Not Detected.					
92 Pentachlorophenol	266.00	Compound Not Detected.					
* 95 Phenanthrene-d10	188.00	15.486	15.501	(1.000)	131926	40	
96 Phenanthrene	178.00	Compound Not Detected.					
97 Anthracene	178.00	Compound Not Detected.					
99 Di-n-butylphthalate	149.00	Compound Not Detected.					
102 Fluoranthene	202.00	Compound Not Detected.					
103 Benzidine	184.00	Compound Not Detected.					
104 Pyrene	202.00	Compound Not Detected.					
$ 106 Terphenyl-d14	244.00	19.348	19.348	(0.880)	226260	68	34
110 Butylbenzylphthalate	149.00	Compound Not Detected.					
112 Benzo(a)anthracene	228.00	Compound Not Detected.					
113 3,3'-Dichlorobenzidine	252.00	Compound Not Detected.					
* 114 Chrysene-d12	240.00	21.993	22.008	(1.000)	105279	40	
115 Chrysene	228.00	Compound Not Detected.					
116 bis(2-Ethylhexyl)phthalate	149.00	Compound Not Detected.					
117 Di-n-octylphthalate	149.00	Compound Not Detected.					
118 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
120 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
122 Benzo(a)pyrene	252.00	Compound Not Detected.					
* 123 Perylene-d12	264.00	25.503	25.510	(1.000)	113747	40	
125 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
126 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
127 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072496a.b/h0006675.d
Lab Smp Id: C07166B1 Client Smp ID: SBLK7S
Inj Date : 24-JUL-1996 10:15
Operator : mjohnson Inst ID: ms3.i
Smp Info : C07166B1 SBLK7S
Misc Info :
Comment :
Method : /chem/ms3.i/h072496a.b/SV8270.m
Meth Date : 05-Aug-1996 09:23 mjohnson
Cal Date : 24-JUL-1996 08:55 Cal File: h0006673.d
Als bottle: 4 QC Sample: BLANK
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
* 16 1,4-Dichlorobenzene-d4	6.840	288384	40.000

RT	AREA	CONCENTRATIONS ON-COL(NG)	FINAL(ug/L)	QUAL	QUANT LIBRARY	LIB ENTRY	CPND #
2-Pentanone, 4-hydroxy-4-methyl-				CAS #: 123-42-2			
5.257	50898	7	4	64	NBS75K.l	3245	16
Unknown Alcohol				CAS #:			
5.792	39832	6	3	0		0	16

GC PURGEABLE HALOCARBONS

CASE NARRATIVE
GC PURGEABLE HALOCARBONS

QAL Lab Reference No./SDG. MB369

Project: BROWN & ROOT COASTAL SYSTEMS STATION

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: Not applicable.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 601 (MOD)

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Matrix Spikes: 2-Chloroethyl vinyl ether was outside acceptable limits for Accuracy (% Recovery) and Precision (RPD). However, analysis of a Laboratory Control Sample immediately after the matrix spikes indicated the analytical system was in control for the compounds found in the associated samples. Since MS/MSD results are subject to matrix effects, these values should be considered to be advisory.

E. Samples: Sample MB369001 (323-1) contained unidentified, late eluting non-target compounds

Primary analysis utilized a Restek Rtx 502.2 (105 meter x 0.53 mm) column. Confirmation analysis used a J&W Scientific DB-VRX (75 meter x 0.45 mm) column.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Jwell W. Smiley DATE: 08-06-96
for Herb Kelly
Organic Division Manager

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH[1]
MB369001RE	323-1	WATER	7/12/96	N/A	7/20/96	<2
MB369002	323-1B	WATER	7/12/96	N/A	7/19/96	<2
MB369003	TRIP_BLANK	WATER	7/12/96	N/A	7/19/96	<2
WMV096G191	VBLK001	WATER	N/A	N/A	7/19/96	N/A

[1] Applies to samples designated for purgeable VOA analysis only.

CURRENT METHOD DETECTION LIMITS (MDLs)
PURGEABLE HALOCARBONS

Date collected:	N/A	Sample Group:	LABQC
Date extracted:	N/A	Lab Sample ID:	Multiple Samples
Date analyzed:	3/13/96	Lab file 1 ID:	N/A
Matrix:	Water	Lab file 2 ID:	N/A
Method:	EPA601 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	0.093
75-25-2	Bromoform	1.0	0.142
74-83-9	Bromomethane	1.0	0.089
56-23-5	Carbon tetrachloride	1.0	0.090
108-90-7	Chlorobenzene	1.0	0.141
75-00-3	Chloroethane	1.0	0.101
110-75-8	2-Chloroethyl vinyl ether	1.0	0.100
67-66-3	Chloroform	1.0	0.086
74-87-3	Chloromethane	1.0	0.138
124-48-1	Dibromochloromethane	1.0	0.106
95-50-1	1,2-Dichlorobenzene	1.0	0.128
541-73-1	1,3-Dichlorobenzene	1.0	0.137
106-46-7	1,4-Dichlorobenzene	1.0	0.145
75-71-8	Dichlorodifluoromethane	1.0	0.181
75-34-3	1,1-Dichloroethane	1.0	0.079
107-06-2	1,2-Dichloroethane	1.0	0.089
75-35-4	1,1-Dichloroethene	1.0	0.138
156-59-2	cis-1,2-Dichloroethene	1.0	0.074
156-60-5	trans-1,2-Dichloroethene	1.0	0.066
78-87-5	1,2-Dichloropropane	1.0	0.097
10061-01-5	cis-1,3-Dichloropropene	1.0	0.095
10061-02-6	trans-1,3-Dichloropropene	1.0	0.113
75-09-2	Methylene chloride (Dichloromethane)	5.0	2.029
79-34-5	1,1,2,2-Tetrachlorethane	1.0	0.214
127-18-4	Tetrachloroethene	1.0	0.104
71-55-6	1,1,1-Trichloroethane	1.0	0.088
79-00-5	1,1,2-Trichloroethane	1.0	0.135
79-01-6	Trichloroethene	1.0	0.091
75-69-4	Trichlorofluoromethane	1.0	0.096
75-01-4	Vinyl chloride	1.0	0.160

CLIENT SAMPLE ID

323-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected:	7/12/96	Sample Group:	MB369
Date extracted:	N/A	Lab Sample ID:	MB369001RE
Date analyzed:	7/20/96	Lab file 1 ID:	G19T020
Matrix:	Water	Lab file 2 ID:	G19U020
Method:	EPA601 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
	SURROGATE-Fluorobenzene (QC Limits - 61-133%)		96 % Rec.

FORM I GC

CLIENT SAMPLE ID

323-1B

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected:	7/12/96	Sample Group:	MB369
Date extracted:	N/A	Lab Sample ID:	MB369002
Date analyzed:	7/19/96	Lab file 1 ID:	G19T010
Matrix:	Water	Lab file 2 ID:	G19U010
Method:	EPA601 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
	SURROGATE-Fluorobenzene (QC Limits - 61-133%)		91 % Rec.

FORM I GC

CLIENT SAMPLE ID

TRIP_BLANK

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected:	7/12/96	Sample Group:	MB369
Date extracted:	N/A	Lab Sample ID:	MB369003
Date analyzed:	7/19/96	Lab file 1 ID:	G19T009
Matrix:	Water	Lab file 2 ID:	G19U009
Method:	EPA601 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
	SURROGATE-Fluorobenzene (QC Limits - 61-133%)		94 % Rec.

CLIENT SAMPLE ID

VBLK001

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected:	N/A	Sample Group:	LABQC
Date extracted:	N/A	Lab Sample ID:	WMV096G191
Date analyzed:	7/19/96	Lab file 1 ID:	G19T002
Matrix:	Water	Lab file 2 ID:	G19U002
Method:	EPA601 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
	SURROGATE-Fluorobenzene (QC Limits - 61-133%)		103 % Rec.

FORM I GC

GC PURGEABLE AROMATICS

CASE NARRATIVE
GC PURGEABLE AROMATICS

QAL Lab Reference No./SDG. MB369

Project: BROWN & ROOT COASTAL SYSTEMS STATION

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: Not applicable.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 602 (MOD)

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Matrix Spikes: All acceptance criteria were met.

E. Samples: Sample MB369001 (323-1) contained unidentified, late eluting non-target compounds

Primary analysis utilized a Restek Rtx 502.2 (105 meter x 0.53 mm) column. Confirmation analysis used a J&W Scientific DB-VRX (75 meter x 0.45 mm) column.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Jewell W. Smiley DATE: 08-06-96
for Herb Kelly
Organic Division Manager

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH[1]
MB369001RE	323-1	WATER	7/12/96	N/A	7/20/96	<2
MB369002	323-1B	WATER	7/12/96	N/A	7/19/96	<2
MB369003	TRIP_BLANK	WATER	7/12/96	N/A	7/19/96	<2
WMV096G191	VBLK001	WATER	N/A	N/A	7/19/96	N/A

[1] Applies to samples designated for purgeable VOA analysis only.

CURRENT METHOD DETECTION LIMITS (MDLs)
PURGEABLE AROMATICS

Date collected:	N/A	Sample Group:	LABQC
Date extracted:	N/A	Lab Sample ID:	Multiple Samples
Date analyzed:	3/13/96	Lab file 1 ID:	N/A
Matrix:	Water	Lab file 2 ID:	N/A
Method:	EPA602 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	0.102
108-90-7	Chlorobenzene	1.0	0.141
95-50-1	1,2-Dichlorobenzene	1.0	0.128
541-73-1	1,3-Dichlorobenzene	1.0	0.137
106-46-7	1,4-Dichlorobenzene	1.0	0.145
100-41-4	Ethylbenzene	1.0	0.129
1634-04-4	tert-butyl methyl ether	1.0	0.087
108-88-3	Toluene	1.0	0.102
108-38-3/106-42-3	m-, p-Xylene	2.0	0.312
95-47-6	o-Xylene	1.0	0.189

CLIENT SAMPLE ID

323-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected:	7/12/96	Sample Group:	MB369
Date extracted:	N/A	Lab Sample ID:	MB369001RE
Date analyzed:	7/20/96	Lab file 1 ID:	G19T020
Matrix:	Water	Lab file 2 ID:	G19U020
Method:	EPA602 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	4.4
1330-20-7	Xylenes (Total)	1.0	3.3
N/A	Total Volatile Organic Aromatics	1.0	7.6
1634-04-4	Methyl-tert-butyl ether	1.0	U
	SURROGATE-Fluorobenzene (QC Limits - 61-133%)		96 % Rec.

FORM I GC

CLIENT SAMPLE ID

323-1B

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected:	7/12/96	Sample Group:	MB369
Date extracted:	N/A	Lab Sample ID:	MB369002
Date analyzed:	7/19/96	Lab file 1 ID:	G19T010
Matrix:	Water	Lab file 2 ID:	G19U010
Method:	EPA602 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	1.3
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (Total)	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	1.3
1634-04-4	Methyl-tert-butyl ether	1.0	U
	SURROGATE-Fluorobenzene (QC Limits - 61-133%)		91 % Rec.

FORM I GC

CLIENT SAMPLE ID

TRIP_BLANK

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected:	7/12/96	Sample Group:	MB369
Date extracted:	N/A	Lab Sample ID:	MB369003
Date analyzed:	7/19/96	Lab file 1 ID:	G19T009
Matrix:	Water	Lab file 2 ID:	G19U009
Method:	EPA602 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	1.7
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (Total)	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	1.7
1634-04-4	Methyl-tert-butyl ether	1.0	U
	SURROGATE-Fluorobenzene (QC Limits - 61-133%)		94 % Rec.

FORM I GC

CLIENT SAMPLE ID

VBLK001

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected:	N/A	Sample Group:	LABQC
Date extracted:	N/A	Lab Sample ID:	WMV096G191
Date analyzed:	7/19/96	Lab file 1 ID:	G19T002
Matrix:	Water	Lab file 2 ID:	G19U002
Method:	EPA602 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (Total)	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	U
1634-04-4	Methyl-tert-butyl ether	1.0	U
	SURROGATE-Fluorobenzene (QC Limits - 61-133%)		103 % Rec.

FORM I GC

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

CASE NARRATIVE
GC EXTRACTABLE VOLATILE ORGANICS (EDB)

QAL Lab Reference No./SDG. MB369

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 504.1

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: These water samples have been referenced to QC from another laboratory contract. The native sample, matrix spike, and matrix spike duplicate will be reported with the results of our laboratory contract number MB370 (MB370003MS and MB370003MSD).

E. Samples: Sample analysis proceeded normally.

A summary of current applicable method detection limits (MDLs) immediately follows this case narrative.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Tammy Carey DATE: 7/31/96

Tammy Carey
Chemist

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH[1]
MB369001	323-1	WATER	07/12/96	07/29/96	07/29/96	N/A
MB369002	323-1B	WATER	07/12/96	07/29/96	07/29/96	N/A
W07296B1	QC BLANK	WATER	N/A	07/29/96	07/29/96	N/A

[1] Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: 504.1

CAS Number	Compound	MDL ug/L
106-93-4	1,2-Dibromoethane (EDB)	0.003

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL	Concentration:	LOW	Date Extracted:	07/29/96
Lab Sample ID:	MB369001	Sample Matrix:	WATER	Date Analyzed:	07/29/96
Client Sample ID:	323-1	Percent Moisture:		Dilution Factor:	1.0

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

CAS Number		ug/L
106-93-4	1,2-Dibromoethane (EDB) . . .	0.02 U

1,1,2,2-Tetrachloroethane - SS	90

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL	Concentration:	LOW	Date Extracted:	07/29/96
Lab Sample ID:	MB369002	Sample Matrix:	WATER	Date Analyzed:	07/29/96
Client Sample ID:	323-1B	Percent Moisture:		Dilution Factor:	1.0

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

CAS Number		ug/L
106-93-4	1,2-Dibromoethane (EDB) . . .	0.02 U

1,1,2,2-Tetrachloroethane - SS 92

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL	Concentration:	LOW	Date Extracted:	07/29/96
Lab Sample ID:	W07296B1	Sample Matrix:	WATER	Date Analyzed:	07/29/96
Client Sample ID:	QC BLANK	Percent Moisture:		Dilution Factor:	1.0

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

CAS Number		ug/L
106-93-4	1,2-Dibromoethane (EDB) . . .	0.02 U

1,1,2,2-Tetrachloroethane - SS 93

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

GC POLYNUCLEAR AROMATIC HYDROCARBONS

CASE NARRATIVE
GC POLYNUCLEAR AROMATIC HYDROCARBONS

QAL Lab Reference No./SDG. MB369

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 610

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

Both the initial calibration and continuing calibration summaries include data for both the primary and confirmation columns. Each compound will appear in the summary reports twice. The first time the compound will not be proceeded by the "#" symbol, referring to compounds identified from the first column (RTX-5); the next time it will have the "#"symbol, referring to compounds identified from the second column (RTX-200) (for example, Naphthalene and #Naphthalene).

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: This water sample has been referenced to QC from another laboratory contract. The native sample, matrix spike, and matrix spike duplicate will be reported with the results of our laboratory contract number MB370 (MB370003MS and MB370003MSD).

E. Samples: Some report limits were raised for sample MB369001 to reflect non-target chromatographic interference.

Frequently interferences will persist in the extract even after cleanup procedures. Standard cleanup procedures are designed to recover the target compounds and remove interfering non-targets. Precise rules for diluting interferences are difficult to develop. A single non-target peak could be allowed to saturate the detector. However, extracts with multiple non-target peaks might elevate the baseline or alter the baseline noise for part of the chromatogram. If the baseline were severely elevated or noise obstructed the target chromatographic region, targets at or near the report limit could not be positively identified within the interfering peaks. Because GC identification is based largely on retention time, regions with many peaks (noisy regions) will frequently have many false positives. For samples with such chromatographic interference, positive hits are typically not reported unless the peak is significantly above the surrounding noise and/or is not obstructed on one or both analytical columns. In addition, such interferences can be damaging to the chromatography and on-going calibration criteria can not be achieved. Without dilution, report limits would usually be raised in samples with significant interference. Therefore, such samples are typically diluted to minimize interferences and yet achieve the best possible report limits. All other aspects of sample analysis proceeded normally.

A summary of current applicable method detection limits (MDLs) immediately follows this case narrative.

F. Other: Primary and confirmation data were simultaneously acquired using two dissimilar analytical columns (RTX-5 and RTX-200) connected in parallel to one injection port and one detector.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Tammy Carey DATE: 7/31/96

Tammy Carey
Chemist III

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH[1]
MB369001	323-1	WATER	07/12/96	07/15/96	07/25/96	N/A
W07156B1	NBLK06	WATER	N/A	07/15/96	07/24/96	N/A

[1] Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

POLYNUCLEAR AROMATIC HYDROCARBON (PNA) COMPOUNDS

Laboratory Name: CH2M HILL
Analytical Method: 610
Sample Matrix: WATER
Extraction: SEPARATORY FUNNEL

Compound	MDL ug/L
Naphthalene	0.57
2-Methylnaphthalene	0.47
1-Methylnaphthalene	0.42
Acenaphthylene	0.38
Acenaphthene	0.41
Fluorene	0.38
Phenanthrene	0.51
Anthracene	0.32
Fluoranthene	0.60
Pyrene	0.27
Benzo(a)anthracene	0.24
Chrysene	0.49
Benzo(b)fluoranthene	0.40
Benzo(k)fluoranthene	0.39
Benzo(a)pyrene	0.33
Indeno(123-cd)pyrene	0.40
Dibenzo(ah)anthracene	0.30
Benzo(ghi)perylene	0.27

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL	Concentration:	LOW	Date Extracted:	07/15/96
Lab Sample ID:	MB369001	Sample Matrix:	WATER	Date Analyzed:	07/25/96
Client Sample ID:	323-1	Volume Extracted:	1060mL	Dilution Factor:	1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	4	UI
91-57-6	2-Methylnaphthalene . . .	4	UI
90-12-0	1-Methylnaphthalene . . .	4	UI
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene.	2	U
85-01-8	Phenanthrene.	2	U
120-12-7	Anthracene.	2	U
206-44-0	Fluoranthene.	2	U
129-00-0	Pyrene.	2	U
56-55-3	Benzo(a)anthracene. . . .	2	U
218-01-9	Chrysene.	2	U
205-99-2	Benzo(b)fluoranthene . .	2	U
207-08-9	Benzo(k)fluoranthene . .	2	U
50-32-8	Benzo(a)pyrene.	2	U
193-39-5	Indeno(1,2,3-cd)pyrene. .	2	U
53-70-3	Dibenzo(a,h)anthracene. .	2	U
191-24-2	Benzo(g,h,i)perylene. . .	2	U
	Terphenyl-d14 - SS	71	%

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	CH2M HILL	Concentration:	LOW	Date Extracted:	07/15/96
Lab Sample ID:	W07156B1	Sample Matrix:	WATER	Date Analyzed:	07/24/96
Client Sample ID:	NBLK06	Volume Extracted:		Dilution Factor:	1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene . . .	2	U
90-12-0	1-Methylnaphthalene . . .	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene.	2	U
85-01-8	Phenanthrene.	2	U
120-12-7	Anthracene.	2	U
206-44-0	Fluoranthene.	2	U
129-00-0	Pyrene.	2	U
56-55-3	Benzo(a)anthracene. . . .	2	U
218-01-9	Chrysene.	2	U
205-99-2	Benzo(b)fluoranthene . .	2	U
207-08-9	Benzo(k)fluoranthene . .	2	U
50-32-8	Benzo(a)pyrene.	2	U
193-39-5	Indeno(1,2,3-cd)pyrene. .	2	U
53-70-3	Dibenzo(a,h)anthracene. .	2	U
191-24-2	Benzo(g,h,i)perylene. . .	2	U
	Terphenyl-d14 - SS	83	%

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

Brown & Root Environmental
455 FAIRWAY DRIVE, SUITE 200
DEERFIELD BEACH, FLORIDA 33441
(305) 570-5885 (305) 570-5974 (FAX)

SITE MANAGER: G. Goode
PROJECT NAME: CTO-0008
BRE PROJECT NO.: 7413 CODE:
P.O. NO.:

SHIPPED TO: Quality Analytical
(LABORATORY NAME, CITY)

CHAIN OF CUSTODY RECORD

LABORATORY ANALYSIS

SAMPLED BY (PRINT): C. Bogan
SAMPLER SIGNATURE:

☒ STANDARD TAT ☐ RUSH
☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS
RESULTS DUE DATE:

LAB NO.	DATE	TIME	SAMPLE IDENTIFICATION	SAMPLE TYPE COMP.	SAMPLE TYPE GRAB	MATRIX	601 (HCl)	602 (HCl)	8260 (HCl)	504 (N/A)	TPH (H2SO4)	8270 (N/A)	610 (N/A)	Arsenic Chromium Pb (HNO3)	NUMBER OF CONTAINERS
	7-12-96	1320	323-GW-MW01-001				3	3	3	2	1	1	2	1	16
	7-12-96	1250	323-GW-MW01-001 B				3	3	3	2	1	1	2	1	16
			Trip Blank												
			Temp Blank												

COMMENTS: Samples Iced

FOR LAB USE ONLY
LAB # MB 369
PROJ #
ACK VERIFIED
HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC 125 ICE
AMBIENT TEMP
CUSTODY SEAL PH
SAMPLE COND

TOTAL NUMBER OF CONTAINERS

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)	SEAL INTACT?	DATE / TIME	EMPTY BOTTLES RECEIVED BY (SIGNATURE)	SEAL INTACT?	DATE / TIME
① Michael D. Shine	(YES) NO N/A	DATE: 6/25/96 TIME: 3:45 PM	②	YES NO N/A	DATE: 7-10-96 TIME:
RELINQUISHED BY (SIGNATURE) ③	(YES) NO N/A	DATE: 7-12-96 TIME: 1830	RECEIVED BY (SIGNATURE) ④ FedEx	YES NO N/A	DATE: TIME:
RELINQUISHED BY (SIGNATURE) ⑤	YES NO N/A	DATE: TIME:	RECEIVED BY (SIGNATURE) ⑥ David Shine	(YES) NO N/A	DATE: 7-13-96 TIME: 09:00 A

SPECIAL INSTRUCTIONS:

LABORATORY REMARKS:

SAMPLE CONTAINERS PRECLEANED BY: ☐ BRE ☐ LABORATORY ☒ MANUFACTURER

METHOD OF SHIPMENT: FedEx

BILL OF LADING NO.:

WHITE-FULLY EXECUTED COPY
YELLOW-RECEIVING LABORATORY COPY
PINK-SAMPLERS' COPY/QA COPY

SAMPLING TEAM: C. Bogan

RECEIVED FOR LABORATORY BY (SIGNATURE): Billy Sur
DATE: 7/13/96 TIME: 09:00

No. 0267

Sample Receipt Exceptions Rep

Batch Number: MB 369

Origination date: 7/13/96

Client/Project: Brown + Root Environmental

SUMMARY OF EXCEPTION (check one if it applies)

√	Description of exception	Comments (write number of exception description and the impacted sample numbers)
	1. No custody seal as required by the project.	Sample ID 323-GW-MW01-001B
	2. No chain-of-custody provided.	COC lists two containers for 610
	3. Chain-of-custody provided but incomplete.	analysis ~~but both c~~ One container is
✓	4. Samples broken or leaking on receipt.	broken on arrival. The other container has
	5. Temperature of samples inappropriate for analysis requested.	a broken cap.
	6. Container inappropriate for analysis requested.	Sample ID 323-GW-MW01-001 COC
	7. Inadequate sample volume for analysis requested.	lists ~~3~~ three containers for 8260
	8. Preservation inappropriate for analysis requested.	analysis but only two were sent.
	9. Samples received out of holding time for analysis requested.	
	10. Samples received more than 72 hours after sampling.	
	11. Discrepancies between chain-of-custody and container labels.	
	12. Other (describe on right)	

FRACTION(S) AFFECTED (specify which fraction was affected by the exceptions detailed above by writing the number of the exception next to it)

Unpreserved		Nutrients		Metals		Volatiles	
Cyanide		Extractables		Extractables	✓	Other (specify)	

ACTION TAKEN:

Originator: David Shine

Supervisor:

Client was notified on: (DATE/TIME) 7/15

Client contact: Jerry Goode

Client's comments: Proceed w/ other analysis — add Pb furnace to metals

Client Services: [illegible]

QA officer:

00066

QAL Montgomery

RECT_CARLDOC