

DATE: December 20, 2000

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FROM: Ken Woodruff, REAC Task Leader

THROUGH: Steven A. Clapp, REAC Program Manager

SUBJECT: Trip Report, Mills Gap Road, W.A.# 0-0141

PURPOSE

The purpose of this work assignment was to provide technical assistance to the U.S. Environmental Protection Agency/Environmental Response Team Center (U.S. EPA/ERTC) in investigating groundwater contamination thought to originate from the Mills Gap Road Site. The work was carried out by staff of the Response Engineering and Analytical Contract (REAC) under Work Assignment # 0-0141. This report summarizes the results of surface geophysical investigations and water sampling completed during the week of August 14, 2000 and trenching operations completed on September 12, 2000.

SITE BACKGROUND

The Mills Gap Road Site is located south of Asheville, North Carolina, near the town of Skyland. A large one-story building, formerly used for electroplating operations, occupies a portion of the 57 acre site. Records indicate that solvents used at the plant include trichloroethylene (TCE), acetone, and ethylene acetate (Tetra Tech EM Inc., 2000). The plant operated from approximately 1964 to 1986 and was listed in CERCLIS in 1991 based on investigations by U.S. EPA Region IV. Further work by the North Carolina Department of Environment and Natural Resources (NCDENR) identified 2 springs and one private well, located topographically downgradient from the site, that were variously contaminated with TCE, petroleum hydrocarbons, and other chlorinated solvents. The Superfund Technical Assessment and Response Team (START) contractor for U.S. EPA Region IV conducted soil sampling at the site in November 1999 and found varying concentrations of volatile organic and extractable organic compounds at some locations. The site is presently unused.

Dabbagh and McDaniel (1981) indicate that the site is located on the east side of a northeast-southwest trending antiform and is underlain by a micaceous schist of Precambrian age. Only the weathering product of the schist, a reddish-brown saprolite, is exposed at the site. The total depth of weathering beneath the site is unknown.

SITE VISIT - AUGUST 14 TO 17, 2000

Geophysical Survey Methods

Surface geophysical surveys were used to locate any potential buried contamination sources such as tanks, drums, product supply lines, or drain fields. Surveys were conducted in the following areas:

- the unpaved portion of the north side (front) of the site building
- the south side (rear) of the facility where much of the treatment equipment had been located
- along the road near the rear of the site where debris and scrap metal had been dumped
- in the woods on the adjacent property, southeast of the site, upgradient from the springs

The geophysical grids established at the site are indicated on Figure 1. The northernmost grid was referenced to an instrument base station located at (0N, 0W), an arbitrarily defined point located in the front parking lot of the site building. The remaining surveys were referenced to separate arbitrary starting points but all surveys used the same site instrument base station. Steep terrain, heavy brush, and numerous sources of geophysical background noise prevented the use of a conventional rectangular grid on the south side of the building similar to that used on the north side.

A Geonics EM-31TM terrain conductivity meter and a Gem Systems GSM-19TM magnetometer were used to collect readings every 5 feet along the survey lines. On the north side of the building, survey lines were spaced 20 feet apart along lines -60W to -240W and 10 feet apart for the remaining portion of the survey. Line spacing was 10 feet in the rear of the building and varied between approximately 10 and 20 feet along the site back road (lines L1 through L4). The two lines of the offsite survey in the adjacent woods (offsite lines L1 and L2) were spaced 20 feet apart. Because of the large amount of metallic objects and other sources of interference, no magnetic surveys were conducted directly in the rear of the building. To compensate for natural changes in the earth's magnetic field during processing of the magnetic data, base station readings were taken with the magnetometer before and after each magnetic survey.

Geophysical Survey Results

Terrain conductivity results are indicated on Figures 2 (quadrature phase) and 3 (in-phase); magnetic survey results are shown on Figures 4 (total magnetic field) and 5 (vertical magnetic gradient). None of the surveys suggested the presence of buried drums or tanks. The linear sequence of circular anomalies apparent on the northernmost conductivity surveys extending across lines -100W to -200W is probably due to a buried water line. The linear features close to the building extending across lines -340W to -450W are likewise believed to be due to water lines (Figures 2 and 3). Water hydrants are located on this trend. High conductivity values at the ends of many of the lines for the northernmost survey result are likely due to the site building or the chain-metal fence around the perimeter of the site.

Interference from the building and abundant metallic debris hinder definition of metallic targets that might be buried on the south side of the building. Most of the area is also covered with a concrete pad that apparently contains steel reinforcing bars. Both conductivity and magnetic data from the two

approximately parallel lines along the site back road reflect only the presence of metallic surface debris located near the top of the hill at the junction of onsite lines L1-L3 and L2-L4. The offsite conductivity survey on the adjacent property showed only small changes in conductivity due to natural variations in earth properties. Note the expanded conductivity scales necessary to indicate the existence of these small variations (Figures 2 and 3).

Spring Sampling

Two springs located on the adjacent property, east of the site (Figure 1), were sampled for volatile organic compounds (VOCs), base neutral and acid extractables (BNAs), pesticides and polychlorinated biphenols (PCBs), target analyte list (TAL) metals, background fluorescence, oil fingerprint analysis, and total petroleum hydrocarbons. For purposes of this report the springs are designated "Upper" (southernmost) and "Lower" (northernmost).

Results of the spring water analyses (detected compounds only) are summarized in Table 1. The complete analytical report is provided in Appendix A. Approximately 11,000 micrograms/liter (: g/L) of TCE was detected in the Lower Spring but only 23 : g/L of TCE was found in the Upper Spring. Cis-1,2, dichloroethene was present in both the Upper Spring and Lower Spring at concentrations of 330 : g/L and 400 : g/L, respectively. Small amounts of benzene and p&m xylene were detected in the Lower Spring. The Upper Spring water contained low concentrations of 1,1 dichloroethane, toluene, o-xylene, and ethylbenzene.

No BNAs were detected in the Upper Spring but 72 : g/L of 2-methylnaphthalene and 17 : g/L of naphthalene were found in the water from the Lower Spring. The laboratory also noted the presence of numerous non-target compounds, including hydrocarbons, in the Lower Spring water. No pesticides or PCBs were found in water from either spring.

Total petroleum hydrocarbons found in the Upper Spring water was 200,000 : g/L and matched the fingerprint pattern for No. 2 fuel oil. The Lower Spring water contained 16,000 : g/L of total petroleum hydrocarbons but the fingerprint analyses did not match any of the standard patterns. The water from both springs had some natural fluorescence. However, further testing by spiking the samples with fluorescein dye, indicated that the natural background fluorescence would not interfere with a dye tracer test.

Sump Sampling

A large rectangular below grade sump, nearly filled with water, is located in the southwest corner of the building and apparently was used in the plant waste treatment process. Water in the sump was sampled for VOCs, BNAs, pesticides, PCBs, TAL metals, and cyanide. No organic compounds were detected in the sump. The only metals present were those that would be naturally present in local soils. Laboratory results are provided in Appendix A.

SITE VISIT - SEPTEMBER 12, 2000

Trenching Operations

During the site visit of September 12, 2000, the U.S. EPA Region IV mobilized START personnel to excavate exploratory trenches at locations based on previous field observations and the results

of the geophysical surveys. Trenching operations were witnessed by REAC staff. Locations of the trenches are indicated on Figure 1. Trenches generally were 15 to 20 feet long, 3 feet wide, and located in areas of disturbed soils, where spills may have occurred, or over geophysical anomalies. All trenches but Trench 8 (Figure 1) were approximately 8-12 feet deep. Trench 8 was excavated 18 feet deep in order to expose as much vertical soil profile as possible. All excavations were dry and, except possibly in Trench 1, no obvious sources of contamination were found. A black-stained layer, approximately 8 inches below the ground surface was observed in Trench 1 and an odor similar to fuel oil was detected during the excavation. The outlines of the stained layer suggested it was associated with a buried road surface rather than an accidental fuel spill. A 1-inch diameter steel water line was also uncovered in Trench 1, trending approximately east-west.

Soil samples from the stained layer in Trench 1 and from the bottom of Trench 8 were collected for analysis of VOCs, BNAs and total petroleum hydrocarbons. The results are summarized in Table 1 and the validated laboratory report is provided in Appendix A. No VOCs were detected in the soil sample from Trench 1. However the sample from Trench 8 contained 35 micrograms/kilogram (: g/kg) of TCE and small amounts (5: g/kg or less) of 1,2,4 trimethylbenzene, sec-butylbenzene, p-isopyltoluene, n-butylbenzene, and naphthelene. BNAs detected in Trench 1 included naphthlene, 2-methylnaphthlene, and bis(2-ethylhexyl)phthalate all at concentrations below method detection limits. The only BNA found in the Trench 8 sample was bis(2-ethylhexyl)phthalate at a concentration of 900 : g/kg.

FUTURE ACTIVITIES

No major sources of contamination were found outside the building during either site visit. Therefore, future work at the site will concentrate on locating possible sources directly beneath the building floor. Test holes will be drilled through the concrete floor of the building and the underlying soil into the top of competent rock. The holes will be screened for organic vapors using portable field instruments. Detection of organic vapors may justify further air or rock sampling for more detailed laboratory analyses of VOCs.

REFERENCES

Dabbaugh, A. E. and R. D. McDaniel. 1981. Geologic Map and Mineral Resources of the Skyland Quadrangle, North Carolina: North Carolina Department of Natural Resources and Community Development GM 193-NE and MRS 193-NE.

Tetra Tech EM Inc. 2000. Trip Report, Mills Gap Site, Skyland, Buncombe County, North Carolina. Prepared for U.S. Environmental Protection Agency, Region 4, Emergency Response and Removal Branch. TDD No. 04-9909-0006.

APPENDIX A
ANALYTICAL RESULTS - AUGUST 2000
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA
DECEMBER 2000

TABLE 1
SUMMARY OF LABORATORY ANALYSES
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA
DECEMBER 2000

	WATER ⁽¹⁾			SOIL ⁽²⁾	
	Upper Spring	Lower Spring	Sump	Trench 1	Trench 8
VOCs					
Acetone	17 J	800 U	8.0 U	47 B	9.5 JB
1,1 Dichloroethane	5.1	100 U	1.0 U	1.1 U	1.2 U
2-Butanone	20 U	400 U	4.0 U	5.5	4.8 U
cis-1,2-Dichloroethene	330	400	1.0 U	1.1 U	1.2 U
Chloroform	5.0 U	120 B	1.0 U	1.1 U	1.2 U
1,1,1-Trichloroethane	23	460	1.0 U	4.9	35
Benzene	9.9	110	1.0 U	1.1 U	1.2 U
Trichloroethene	23	11,000	11	4.9	35
Toluene	8.9	100 U	1.0 U	4.9	1.2 U
Ethylbenzene	5.1	100 U	1.0 U	3.4	1.2 U
p&m xylene	5.0 U	140	1.0 U	5.5	1.2 U
o-xylene	11	100 U	1.0 U	4.8	1.2
n-propylbenzene	5.0 U	100 U	1.0 U	1.9	1.2 U
1,3,5-Trimethylbenzene	5.0 U	100 U	1.0 U	9.9	1.7
1,2,4-Trimethylbenzene	5.0 U	100 U	1.0 U	22	4.3
sec-Butylbenzene	5.0 U	100 U	1.0 U	2.8	2.1
p-Isopropyltoluene	5.0 U	100 U	1.0 U	3.5	1.6
Naphthalene	5.0 U	100 U	1.0 U	33	3.4
BNAs					
Benzyl alcohol	11 U	3.9 J	11 U	350 U	370 U
Napthalene	11 U	17	10 U	40 J	370 U
2-Methylnaphthlene	11 U	72	11 U	150 J	370 U
Dibenzofuran	11 U	1.9 J	11 U	350 U	370 U
Phenanthrene	11 U	4.2 J	11 U	350 U	370 U
Bis(2-Ethylhexyl)phthalate	11 U	1.1 J	11 U	120 J	900

(1) Results in micrograms/liter

(2) Results in micrograms/kilogram dry weight

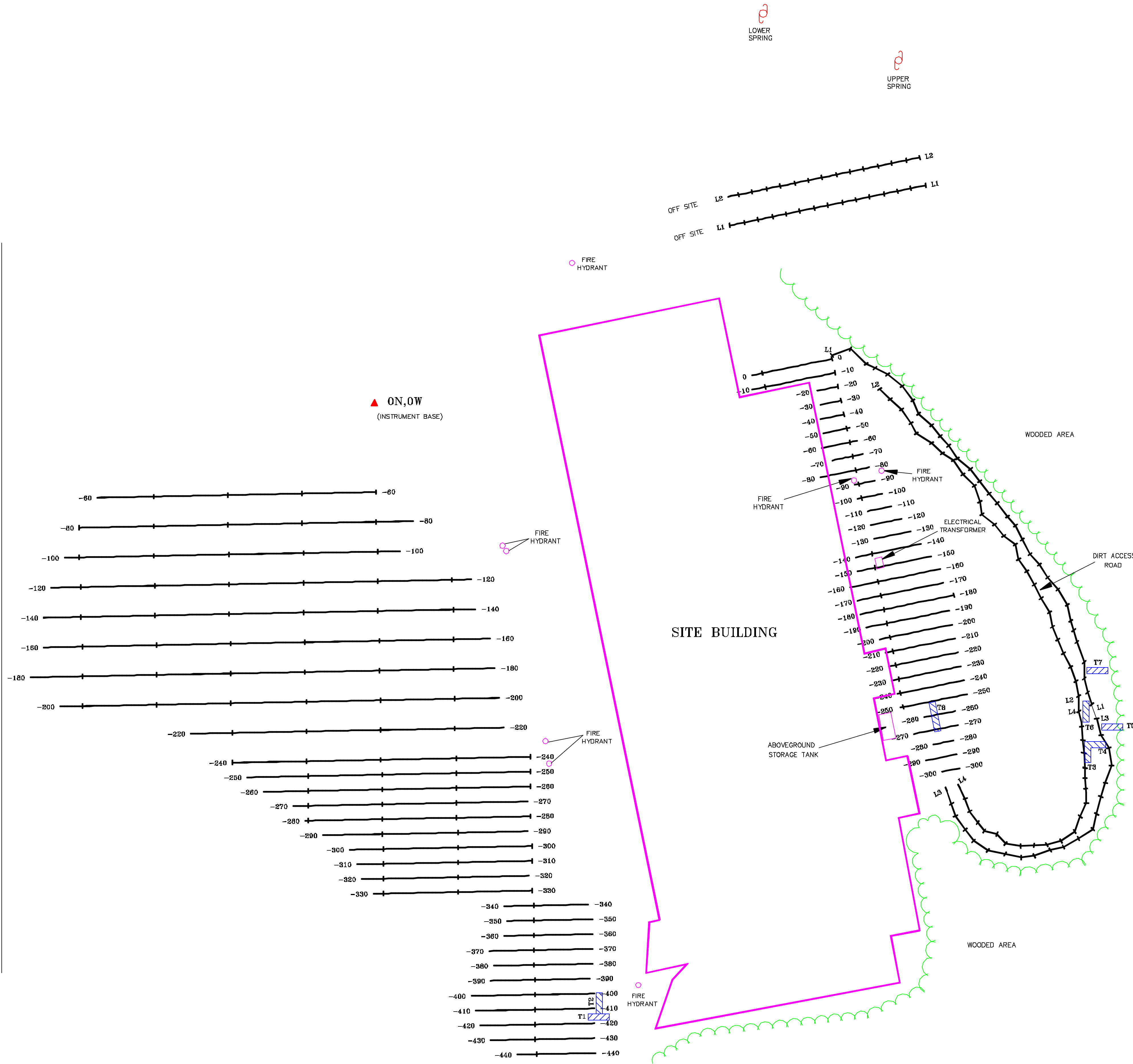
U = non-detect, number is minimum detection limit

J = detected below minimum detection limit

B = compound found in laboratory blank

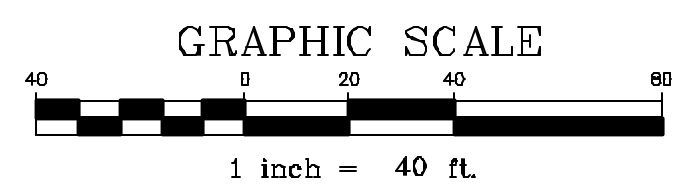
Bold print = detected compounds

MILLS GAP ROAD



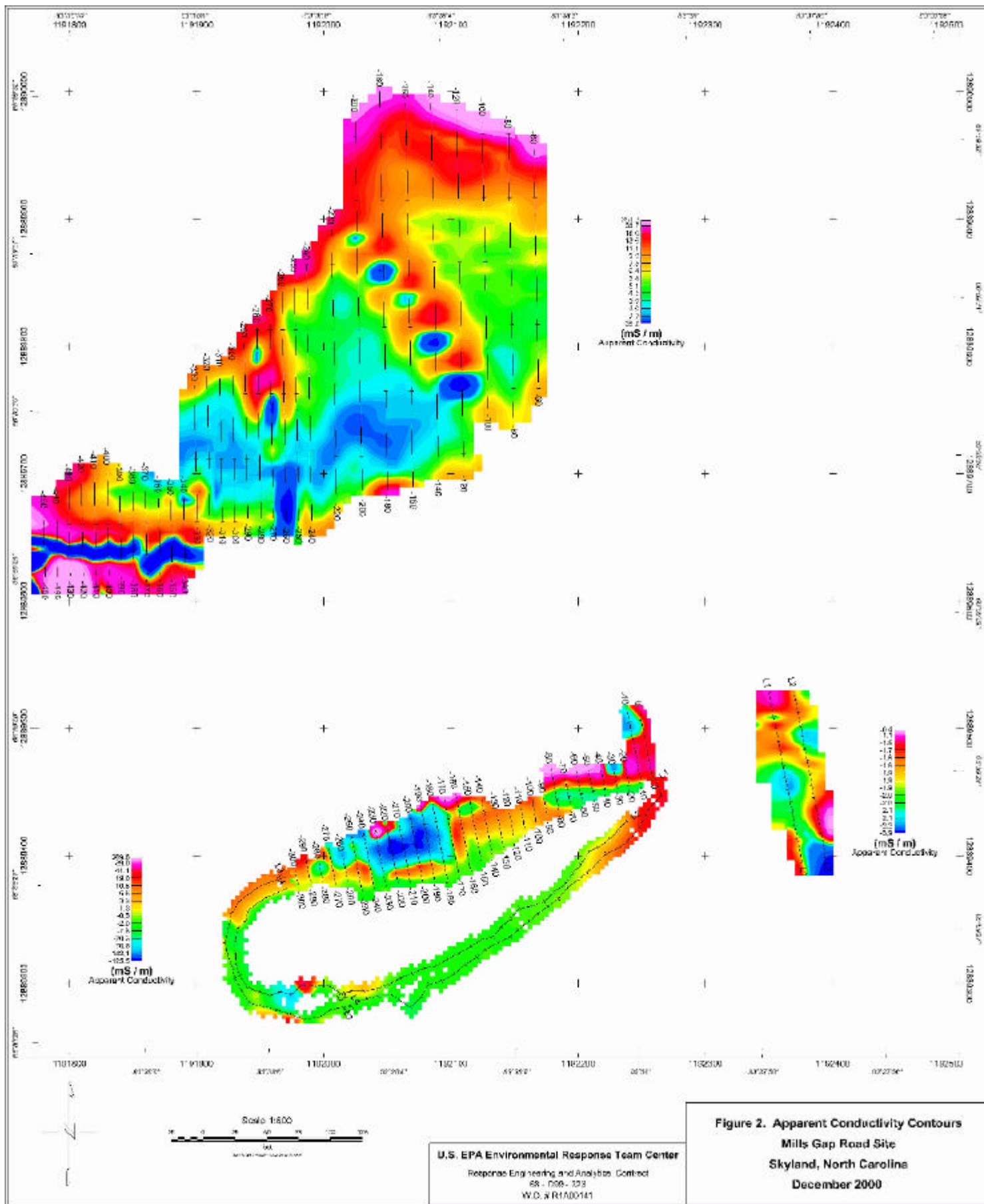
LEGEND

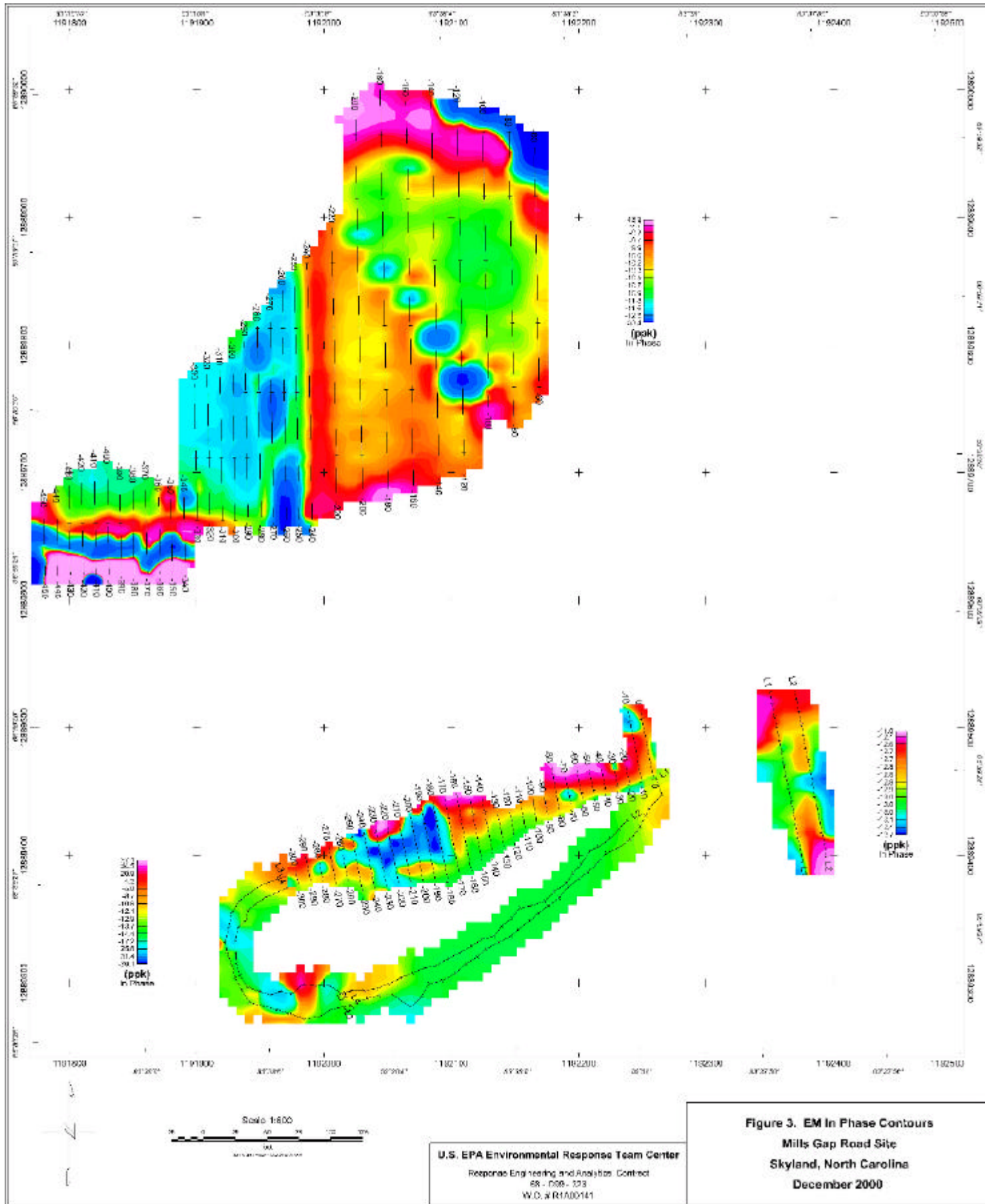
- BUILDING BOUNDARY
- GEOPHYSICAL SURVEY GRID LINE
- EXPLORATORY TRENCH
- TREE LINE

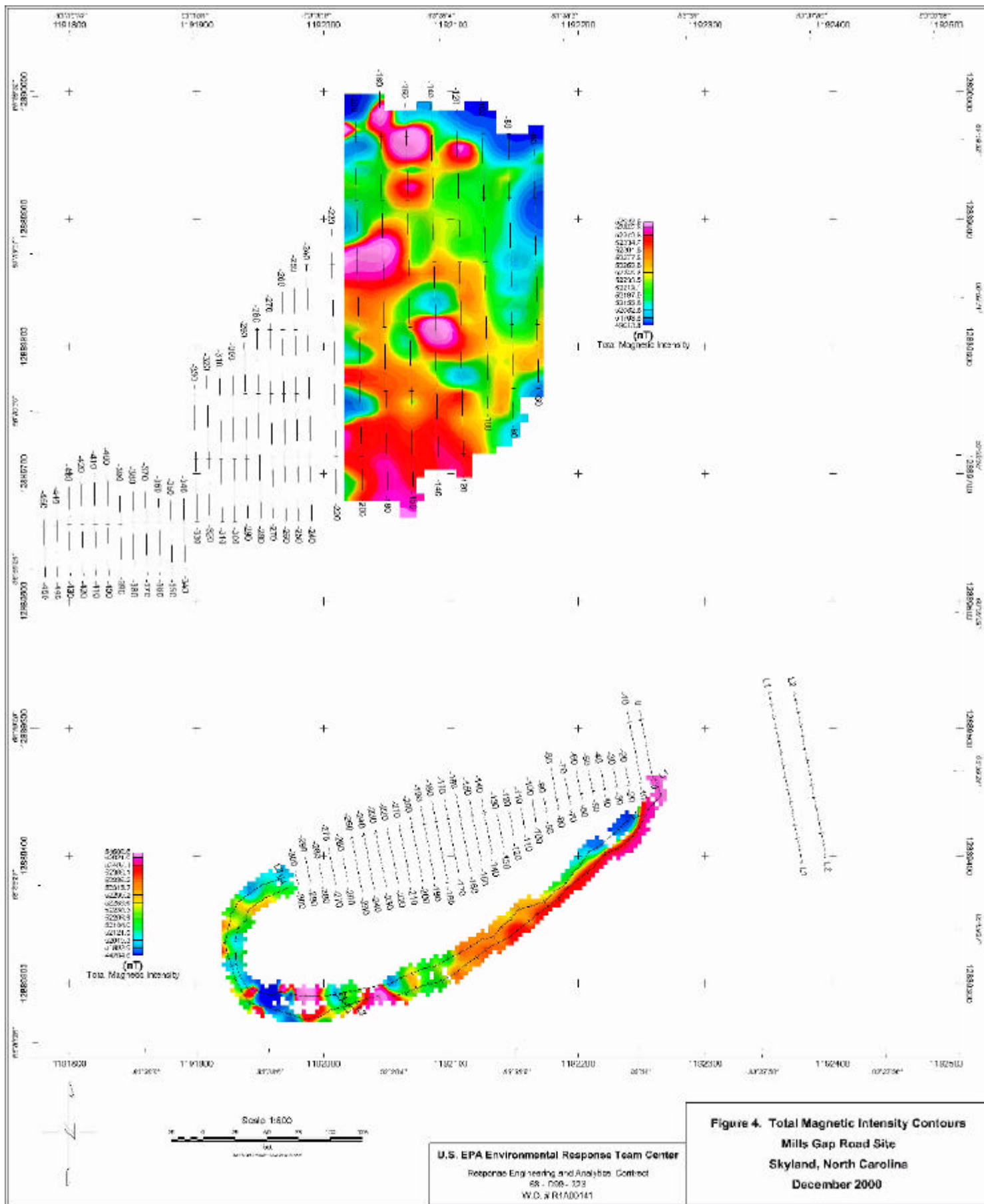


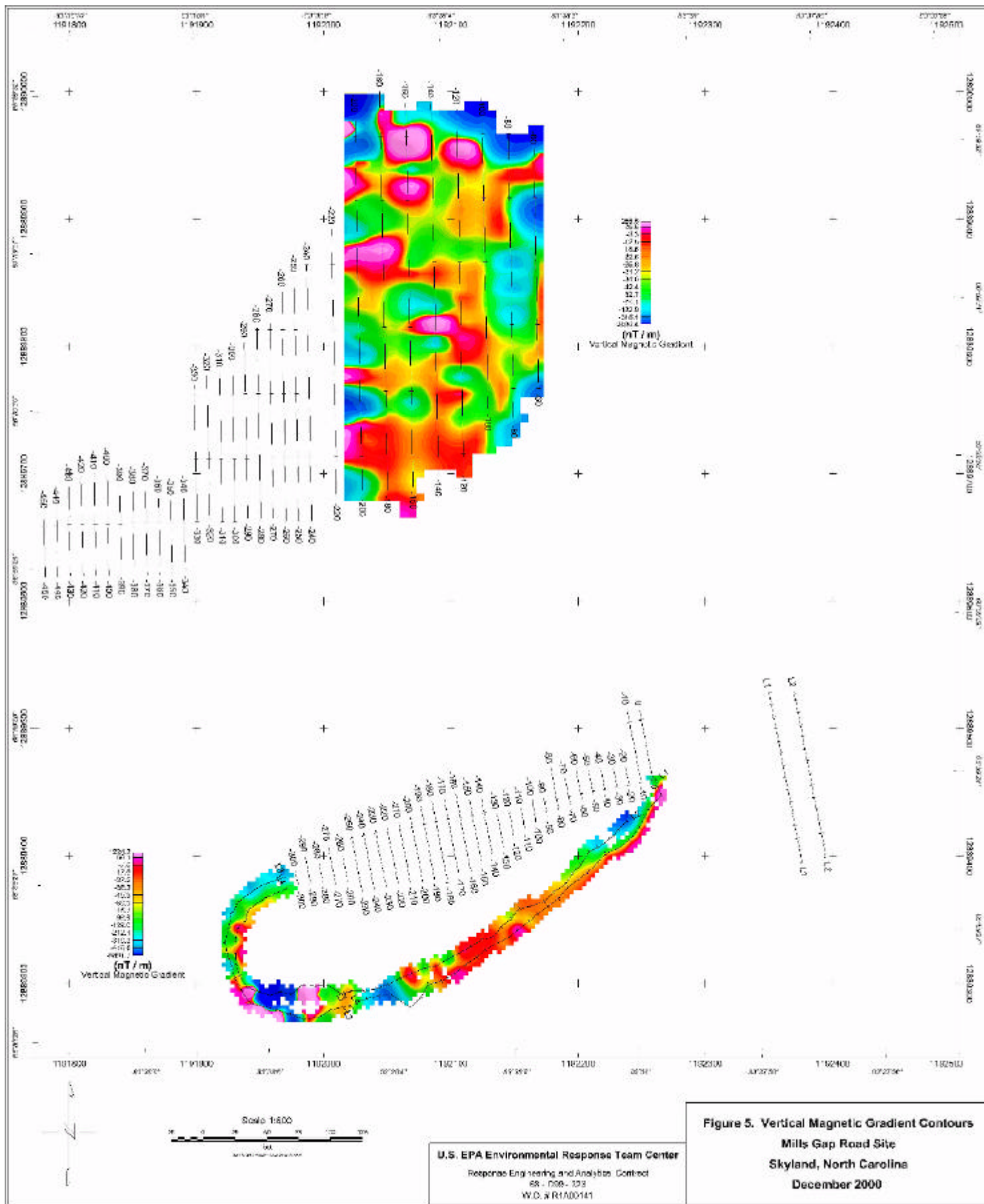
U.S. EPA ENVIRONMENTAL RESPONSE TEAM CENTER
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
60-C199-223
V014 10A0001

FIGURE 1
SITE MAP AND GLOBAL
POSITIONING SYSTEM SURVEY
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA
DECEMBER 2000









ANALYTICAL REPORT

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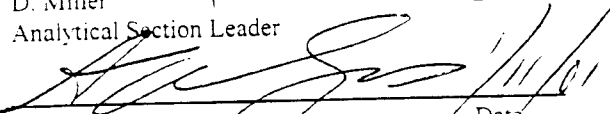
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Appendices will be furnished on request.

Introduction

REAC in response to WA 0-141, provided analytical support for environmental samples collected from Mills Gap Road, located in Skyland, NC as described in the following table. The support also included QA/QC, data review, and preparation of an analytical report containing a summary of the analytical methods, the results, and the QA/QC results.

The samples were treated with procedures consistent with those specified in SOP #1008.

COC #	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
01031	3	8/16/00	8/18/00	Water	VOC	REAC
01031	2	8/16/00	8/18/00	Water	TAL Metals	REAC
01031	2	8/16/00	8/18/00	Water	Pest/PCBs	REAC
01031	2	8/16/00	8/18/00	Water	Fluorescence	REAC
01031	2	8/16/00	8/18/00	Water	BNA	REAC
01032	3	8/17/00	8/24/00	Water	VOC	REAC
01034	1	8/17/00	8/18/00	Water	BNA, Pest/PCBs	REAC
01034	1	8/16/00	8/18/00	Water	BNA, Pest/PCBs	REAC
01034	1	8/17/00	8/18/00	Water	Cyanide	REAC
01034	1	8/17/00	8/18/00	Water	TAL Metals	REAC
01034	1	8/17/00	8/18/00	Water	VOC	REAC
01035	2	8/16/00	8/18/00	Water	Oil Fingerprint, Cyanide	Katahdin
01041	1	8/17/00	8/22/00	Water	Cyanide	Katahdin
01087	2	9/12/00	9/13/00	Soil	VOC, BNA	REAC

Case Narrative

The data in this report have been validated to two significant figures. Any other representation of the data is the responsibility of the user.

Any result that was less than 25% of the method detection limit is not reported.

VOC in Water Package J 332

The method blank contained 1.2 µg/L chloroform. The chloroform concentration in samples 00304 and 00306 should be regarded as not detected because the concentration of chloroform in these samples is less than five times that of the method blank.

In the initial calibration of 8/21/00 the acceptable QC limits for the percent relative standard deviation were exceeded by naphthalene (31%). The data are not affected because naphthalene was not detected in the associated samples.

In the continuing calibration check standard of 8/22/00, the acceptable QC limits for the percent difference were exceeded by 2,2-dichloropropane (32%), 4-methyl-2-pentanone (25.4%), 2-hexanone (30%), 1,2-dibromo-3-chloropropane (31%) and naphthalene (33%). The data are not affected because these analytes were not detected in the associated samples.

VOC in Water Package J 344

In the continuing calibration check standard of 8/28/00, the acceptable QC limits for the percent difference were exceeded by dichlorodifluoromethane (51%), chloromethane (31%), bromomethane (28%) and naphthalene (30%). The data are affected as follows:

The concentration of dichlorodifluoromethane in samples Lisenbee A-1, Schmidt A, B, C and Randall A, B, C and the method blank should be regarded as estimated.

VOC in Soil Package J 381

The method blank contained 1.2 µg/kg acetone. The acetone concentration in samples 00617 should be regarded as not detected because the concentration is less than ten times that of the blank.

In the initial calibration the acceptable QC limits for the relative percent difference were exceeded by vinyl chloride (64%), 1,2,4-trichlorobenzene (31%) and naphthalene (34%). The data are affected as follows:

The concentration of vinyl chloride and naphthalene in samples 00615 and 00617 should be regarded as estimated.

In the continuing calibration check standard of 9/15/00, the acceptable QC limits for the percent difference was exceeded by bromomethane (49%). The data are not affected because this analyte was not detected in the associated samples.

For sample 00615, the acceptable QC limits for the area were exceeded by the internal standard for chlorobenzene-d₅ (32%). The analytes quantified by this internal standard, namely

4-methyl-2-pentanone	1,1,2,2-tetrachloroethane	1,3-dichlorobenzene
toluene-d8	p-bromofluorobenzene	1,4-dichlorobenzene
toluene	1,2,3-trichloropropane	n-butylbenzene
2-hexanone	n-propylbenzene	1,2-dichlorobenzene
tetrachloroethene	bromobenzene	1,2-dibromo-3-chloropropane
chlorobenzene	1,3,5-trimethylbenzene	1,2,4-trichlorobenzene
1,1,1,2-tetrachloroethane	2-chlorotoluene	hexachlorobutadiene
ethylbenzene	4-chlorotoluene	naphthalene
p&m-xylene	tert-butylbenzene	1,2,3-trichlorobenzene
o-xylene	1,2,4-trimethylbenzene	
styrene	sec-butylbenzene	
isopropylbenzene	p-isopropyltoluene	

should be regarded as estimated.

The acceptable QC limits for the percent recoveries were exceeded by trichloroethylene in the MS/MSD pair for sample 00617 (MS 43%, MSD 41%). The data are not affected.

BNA in Water Package J 341

In the initial calibration of 8/18/00 the acceptable QC limits for the relative standard deviation were exceeded for 2,4-dinitrophenol (30.5%). The data are not affected because 2,4-dinitrophenol was not detected in the associated samples.

The acceptable QC limits for the percent recovery were exceeded for one base/neutral surrogate for sample A, B, C 00309. The data are not affected.

BNA in Soil Package J 368

In the initial calibration of 8/18/00 the acceptable QC limits for the relative standard deviation were exceeded for 2,4-dinitrophenol (30.47%). The data are not affected because 2,4-dinitrophenol was not detected in the associated samples.

Pesticides in Water Package J 345

In the continuing calibration check standard of 8/22/00 the acceptable QC limits for the percent difference were exceeded for p,p'-DDT (36%). The data are not affected because p,p'-DDT was not detected in the associated samples.

In the continuing calibration check standard of 8/29/00 the acceptable QC limits for the percent difference were exceeded by p,p'-DDT (33%) and methoxychlor (30%). The data are not affected because p,p'-DDT and methoxychlor were not detected in the associated samples.

The acceptable QC limits for the percent recovery was exceeded by both surrogates for samples A, B, C 00309 and A, B, C 00309 MS. The pesticide/PCB results for sample A, B, C 00309 should be regarded as unusable.

The acceptable QC limits for the percent recovery was exceeded by all analytes for the MS/MSD pair A, B, C 00309

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MS and A, B, C 00309 MSD. The pesticide/PCB results for sample A, B, C 00309 should be regarded as unusable.

Metals in Water Package J 340

The acceptable QC limits for the percent recovery was exceeded for the 2.0 µg/L method detection limit standard for arsenic (130%) and selenium (150%). The method detection limits for arsenic and selenium for samples A 00313, A 00305 and A 00311 were calculated based on the 5.0 µg/L standard.

The acceptable QC limits for the percent difference was exceeded for zinc (15%) in the dilution analysis of sample A 00311. The zinc concentration in sample A 00311 should be regarded as estimated.

Oil Fingerprint. TPH and Cyanide in Water Package J 357

Cyanide

The sample for cyanide analysis was received without ice. The results of the cyanide analysis should be regarded as estimated.

TPH and Oil Fingerprint

The acceptable QC limits for the percent difference was exceeded for the end of sequence continuing calibration check standard of TPH (19%). The data are not affected because this calibration standard was not used to quantify any data.

The acceptable QC limits for the surrogate percent recoveries were exceeded for both samples because the samples were diluted for analysis and the surrogate could not be recovered. The concentration of total petroleum hydrocarbons for both samples should be regarded as estimated.

Summary of Abbreviations

AA	Atomic Absorption
B	The analyte was found in the blank
BFB	Bromofluorobenzene
C	Centigrade
cont.	Continued
D	(Surrogate Table) this value is from a diluted sample and was not calculated (Result Table) this result was obtained from a diluted sample
Dioxin	denotes Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans and/or PCDD and PCDF
CLP	Contract Laboratory Protocol
COC	Chain of Custody
CONC	Concentration
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
DFTPP	Decafluorotriphenylphosphine
DL	Detection Limit
E	The value is greater than the highest linear standard and is estimated
EMPC	Estimated maximum possible concentration
ICAP	Inductively Coupled Argon Plasma
ISTD	Internal Standard
J	The value is below the method detection limit and is estimated
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDL	Method Detection Limit
MI	Matrix Interference
MS (BS)	Matrix Spike (Blank Spike)
MSD (BSD)	Matrix Spike Duplicate (Blank Spike Duplicate)
MW	Molecular Weight
NA	either Not Applicable or Not Available
NC	Not Calculated
NR	Not Requested
NS	Not Spiked
% D	Percent Difference
% REC	Percent Recovery
PPB	Parts per billion
PPBV	Parts per billion by volume
PPMV	Parts per million by volume
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
QL	Quantitation Limit
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SIM	Selected Ion Monitoring
TCLP	Toxic Characteristics Leaching Procedure
U	Denotes not detected
W	Weathered analyte; the results should be regarded as estimated
m ³	cubic meter kg kilogram µg microgram
L	liter g gram pg picogram
mL	milliliter mg milligram ng nanogram
µL	microliter
*	denotes a value that exceeds the acceptable QC limit
	Abbreviations that are specific to a particular table are explained in footnotes on that table

Revision 2/15/00

00141\DEL\AR\0101\REPORT

Analytical Procedure for VOC in Water

A modified 524.2 method for the analysis of Volatile Organic Compounds in water was used. Samples were purged, trapped, and desorbed to a GC/MS system. Prior to purging, the samples were spiked with a three component surrogate mixture consisting of toluene- d_8 , 4-bromofluorobenzene and 1,2-dichloroethane- d_4 and a three component internal standard mixture consisting of bromochloromethane, 1,4-difluorobenzene, and chlorobenzene- d_5 .

The purge and trap unit consisted of: A Tekmar concentrator (3000 series) equipped with an Archon autosampler (Dynateck Corp.) and a VOCARB 3000 trap (Supelco).

The purge and trap instrument conditions were:

Purge	10 min at 25° C
Dry Purge	2 min at 25° C
Desorb Preheat	245° C
Desorb	4 min at 230° C
Purge Flow Rate	40 mL/min
Bake	10 min at 260° C

A Hewlett Packard 5973 GC/MSD equipped with an HP Chem Station data system was used to analyze the data.

The instrument conditions were:

Column:	30 meter x 0.25 mm ID, RTx-Volatiles (Restek Corp.) column with 3.0 μ m film thickness.
Temperature:	4 min at 40° C 9° C/min to 165° C, hold for 2 min. 12° C/min to 220° C, hold for 7 min.
Flow Rate	Helium at 1.0 mL/min.
Mass Spectrometer:	Electron Impact Ionization at a nominal electron energy of 70 electron volts, scanning from 35-350 amu at one scan/sec.

Computer: Preprogrammed to plot Extracted Ion Current Profile (EICP); capable of integrating ions and plotting abundances vs time or scan number. A library search (NBS-Wiley) for tentatively identified compounds was performed on samples.

The GC/MS system was calibrated using 6 VOC standards, with the exception of acetone, at 5, 20, 50, 100, 150, and 200 μ g/L; acetone was calibrated with 5 standards at 20, 50, 100, 150, and 200 μ g/L. Before analysis each day, the system was tuned with 50-ng BFB and passed a continuing calibration check when analyzing a 50 μ g/L standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

The results are in Table 1.1; the tentatively identified compounds are listed in Table 1.2. The concentrations of the analytes were calculated using the following equation:

$$C_u = \frac{A_u \times I_{is} \times D}{A_{is} \times RF \text{ (or } RF_{ave})}$$

where

C_u = Concentration of target analyte ($\mu\text{g/L}$)
 A_u = Area of the target analyte
 I_{is} = Concentration of specific internal standard ($\mu\text{g/L}$)
 A_{is} = Area of the specific internal standard
 RF = Response Factor
 RF_{ave} = Average Response Factor
 D = Dilution factor

The average Response Factor is used when a sample is associated with an initial calibration curve. The Response Factor is used when a sample is associated with a continuing calibration curve.

Response Factor calculation:

The response factor (RF) for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_u \times I_{is}}{A_{is} \times I_u}$$

where,

RF = Response factor for a specific analyte
 A_u = Area of the analyte in the standard
 I_{is} = Concentration of the specific internal standard
 A_{is} = Area of the specific internal standard
 I_u = Concentration of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \dots + RF_n}{n}$$

and

n = number of Samples

Revision of 8/23 /00

Analytical Procedure for VOC in Soil

A modified 524.2 method was used for the analysis of Volatile Organic Compounds in soil. Samples were purged, trapped, and desorbed to a GC/MS system. Prior to purging, the samples were spiked with a three component surrogate mixture consisting of toluene- d_8 , 4-bromofluorobenzene and 1,2-dichloroethane- d_2 , and a three component internal standard mixture consisting of bromochloromethane, 1,4-difluorobenzene, and chlorobenzene- d_5 . The following conditions and parameters were utilized:

The purge and trap unit consisted of: A Tekmar concentrator (3000 series) equipped with an Archon autosampler (Dynateck Corp.) and a VOCARB 3000 trap (Supelco).

The purge and trap instrument conditions were:

Purge	10 min at 25° C
Dry Purge	2 min at 25° C
Desorb Preheat	245° C
Desorb	4 min at 230° C
Purge Flow Rate	40 mL/min
Bake	10 min at 260° C

A Hewlett Packard 5973 GC/MSD equipped with an HP Chem Station data system was used to analyze the data.

The instrument conditions were:

Column:	30 meter x 0.25 mm ID, RTx-Volatiles (Restek Corp.) column with 3.0 μ m film thickness.
Temperature:	4 min at 40° C 9° C min to 165° C, hold for 2 min. 12° C min to 220° C, hold for 7 min.
Flow Rate	Helium at 1.0 mL/min.
GC/MS Interface	Capillary direct with 1 mL/min helium carrier gas at 250° C.
Mass Spectrometer:	Electron Impact Ionization at a nominal electron energy of 70 electron volts, scanning from 35-300 amu at one scan/sec.

Computer: Preprogrammed to plot Extracted Ion Current Profile (EICP); capable of integrating ions and plotting abundances vs time or scan number. A library search (NBS-Wiley) for tentatively identified compounds was performed on samples.

The GC/MS system was calibrated using 6 VOC standards at 5, 20, 50, 100, 150, and 200 μ g/L. (The exception was acetone, which was calibrated with 5 VOC standards, 20, 50, 100, 150, and 200 μ g/L) Before analysis each day, the system was tuned with 50-ng BFB and passed a continuing calibration check when analyzing a 50 μ g/l standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

The results are in Table 1.3; the tentatively identified compounds are listed in Table 1.4.

The concentrations of the analytes analyzed by the low level method of 5.0 g soil in 5.0 mL of water were calculated using the following equation:

$$C_u = \frac{A_x \times I_{is}}{A_{is} \times RF \text{ (or } RF_{ave}) \times D}$$

where: C_u = Concentration of target analyte ($\mu\text{g/kg}$) on a dry weight basis if D is used
 A_x = Area of the target analyte
 I_{is} = Concentration of specific internal standard in the volume purged ($\mu\text{g/L}$)
 A_{is} = Area of the specific internal standard
 RF = Response Factor
 RF_{ave} = average Response Factor
 D = Decimal percent solids

The concentrations of the analytes analyzed by the medium level method of extracting 5.0 g soil with 5 mL methanol and diluting an aliquot with 5.0 mL prior to analysis, were calculated using the following equation:

$$C_u = \frac{A_x \times I_{is} \times 5.0 \text{ (Nominal Method Mass)}}{A_{is} \times RF \text{ (or } RF_{ave}) \times W_s \times D}$$

where: C_u = Concentration of target analyte ($\mu\text{g/kg}$) on a dry weight basis if D is used
 A_x = Area of the target analyte
 I_{is} = Concentration of specific internal standard in the volume purged ($\mu\text{g/L}$)
 A_{is} = Area of the specific internal standard
 RF = Response Factor
 RF_{ave} = average Response Factor
 W_s = Mass of sample (g) purged
 D = Decimal percent solids

The average Response Factor is used when a sample is associated with an initial calibration curve. The Response Factor is used when a sample is associated with a continuing calibration curve. Response Factor calculation:

The response factor (RF) for each specific analyte quantitated is based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \times I_{is}}{A_{is} \times I_c}$$

where,

RF = Response factor for a specific analyte
 A_c = Area of the analyte in the standard
 I_{is} = Concentration of the specific internal standard
 A_{is} = Area of the specific internal standard
 I_c = Concentration of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \dots + RF_n}{n} \quad \text{and} \quad n = \text{number of Standards}$$

Revision of 8/22/00

Analytical Procedure for BNA in Water

Extraction Procedure

Prior to extraction, each sample was spiked with a six component surrogate mixture consisting of nitrobenzene- d_5 , 2-fluorobiphenyl, terphenyl- d_{14} , phenol- d_5 , 2-fluorophenol, and 2,4,6-tribromophenol. One liter of sample was extracted according to Method 625, Section 10, as outlined in the Federal Register Vol. 49, #209, Friday, Oct. 26, 1984. The extracts were combined, concentrated to 1.0 ml, an internal standard mixture consisting of 1,4-dichlorobenzene- d_4 , naphthalene- d_8 , acenaphthene- d_{10} , phenanthrene- d_{10} , chrysene- d_{12} , and perylene- d_{12} was added, and analyzed.

Analytical Procedure

A HP 6890 GC and a HP 5972 MSD, equipped with a 6890 autosampler and controlled by a PC computer with Enviroquant software was used to analyze the samples.

The instrument conditions were:

Column:	Restek Rtx-5 (crossbonded SE-54) 30 meter x 0.25 mm ID, 0.50 μ m film thickness
Injector Temperature:	280°C
Transfer Temperature:	280°C
Source Temperature and	
Analyzer Temperature:	Controlled by thermal transfer of heat from transfer line
Temperature Program:	50°C for 0.5 min 20°C/min to 295°C; hold for 8 minutes 25°C/min to 310°C; hold for 8 minutes
Pulsed Split Injection:	Split time = 2.0 min @ 8:1 split ratio Pressure Pulse = 16 psi for 0.5 minute, then normal
Injection Volume:	1 μ L

The GC/MS system was calibrated using 5 BNA standards at 20, 50, 80, 120, and 160 μ g/mL. Before each analysis day, the system was tuned with 50 ng decafluorotriphenylphosphine (DFTPP) and passed a continuing calibration check when analyzing a 50 μ g/mL standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

The BNA results are listed in Table 1.5; the tentatively identified compounds are listed in Table 1.6. The concentration of the detected compounds was calculated using the following equation:

$$C_u = \frac{(A_u)(I_{is})(V_i)(DF)}{(A_{is})(RF \text{ or } RF_{ave})(V_o)(V_i)}$$

where:

C_u	= Concentration of target analyte ($\mu\text{g/L}$)
A_u	= Area of target analyte
I_{is}	= Mass of specific internal standard (ng)
V_i	= Volume of extract (μL)
DF	= Dilution Factor
A_{is}	= Area of specific internal standard
RF	= Response Factor (unitless)
RF_{ave}	= Average Response Factor
V_o	= Volume of sample (mL)
V_i	= Volume of extract injected (μL)

The RF_{ave} is used when a sample is associated with an initial calibration curve. The RF is used when a sample is associated with a continuing calibration curve.

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{(A_c)(I_{is})}{(A_{is})(I_c)}$$

where:

RF	= Response factor for a specific analyte
A_c	= Area of the analyte in the standard
I_{is}	= Mass of the specific internal standard
A_{is}	= Area of the specific internal standard
I_c	= Mass of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \dots + RF_n}{n}$$

and n = number of samples.

Rev. 3/9/00

Analytical Procedure for BNA in Soil

Extraction Procedure

Prior to extraction each sample was spiked with a six component surrogate mixture consisting of nitrobenzene-d₅, 2-fluorobiphenyl, terphenyl-d₁₄, phenol-d₅, 2-fluorophenol, and 2,4,6-tribromophenol. Thirty grams of sample was mixed with 30 g anhydrous sodium sulfate, and Soxhlet extracted for 16 hours with 300 mL of methylene chloride. The extract was concentrated to 1.0 mL, an internal standard mixture consisting of 1,4-dichlorobenzene-d₄, naphthalene-d₈, acenaphthene-d₁₀, phenanthrene-d₁₀, chrysene-d₁₂, and perylene-d₁₂ was added, and analyzed.

Analysis Procedure

An HP 6890/5972 Gas Chromatograph/Mass Spectrometer (GC/MS), equipped with a 6890 autosampler and controlled by a PC computer equipped with Enviroquant software was used to analyze the samples.

The instrument conditions were:

Column:	Restek Rtx-5 (crossbonded SE-54) 30 meter x 0.25 mm ID, 0.50 µm film thickness
Injection Temperature:	280°C
Transfer Temperature:	280°C
Source Temperature and	
Analyzer Temperature:	Controlled by thermal transfer of heat from transfer line
Temperature Program:	50°C for 5 minutes 20°C/min to 295°C: hold for 8.5 minutes 25°C/min to 310°C: hold for 8 minutes
Pulsed Split Injection:	Split time = 2.0 min @ 8:1 split ratio Pressure Pulse = 16 psi for 0.5 minute, then normal
Injection Volume:	1 µL Must use 4 mm ID single gooseneck liners packed with 10 mm plug of silanized and conditioned glass wool.

The GC/MS system was calibrated using 5 BNA standard mixtures at 20, 50, 80, 120, and 160 µg/mL. Before each analysis day, the system was tuned with 50 ng decafluorotriphenylphosphine (DFTPP) and passed a continuing calibration check when analyzing a 50 µg/mL standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

The BNA results, based on dry weight, are listed in Table 1.7; the tentatively identified compounds are listed in Table 1.8. The concentration of the detected compounds was calculated using the following equation:

$$C_u = \frac{(A_u)(I_{is})(V_i)(DF)}{(A_{is})(RF \text{ or } RF_{ave})(V_i)(W)(D)}$$

where:

C_u	= Concentration of target analyte ($\mu\text{g/Kg}$)
A_u	= Area of target analyte
I_{is}	= Mass of specific internal standard (ng)
V_i	= Volume of extract (μL)
DF	= Dilution Factor
A_{is}	= Area of specific internal standard
RF	= Response Factor (unitless)
RF_{ave}	= Average Response Factor
V_i	= Volume of extract injected (μL)
W	= Weight of sample (g)
D	= Decimal per cent solids

The RF_{ave} is used when a sample is associated with an initial calibration curve. The RF is used when a sample is associated with a continuing calibration.

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{(A_c)(I_{is})}{(A_{is})(I_c)}$$

where:

RF	= Response factor for a specific analyte
A_c	= Area of the analyte in the standard
I_{is}	= Mass of the specific internal standard
A_{is}	= Area of the specific internal standard
I_c	= Mass of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \dots + RF_n}{n}$$

and

n = number of Samples

Revision of 3-9-00

Analytical Procedure for Pesticides/PCBs in Water

Extraction Procedure

One liter of sample was spiked with a surrogate solution consisting of tetrachloro-m-xylene and decachlorobiphenyl and extracted three times with 60 mL portions of methylene chloride. The extracts were combined, filtered, concentrated to 10 mL, solvent exchanged with 60 mL hexane, concentrated to 1.0 mL and analyzed.

Gas Chromatographic Analysis

The extract was analyzed for pesticide/PCBs using simultaneous dual column injections. The analysis was done on an HP 6890 GC/ECD system equipped with an HP 6890 automatic sampler. The systems were controlled with an HP-ChemStation. The following conditions were employed:

First Column	DB-608, 30 meter, 0.32 mm fused silica capillary, 0.50 μ m film thickness
Second Column	Rtx-CLPesticides, 30 meter, 0.32 mm fused silica capillary, 0.50 μ m film thickness
Injector Temperature	200°C
Detector Temperature	300°C
Temperature Program	120°C for 1 minute 9°C/min to 285°C, hold for 10 minutes
Injection Volume	1 μ L

The gas chromatographs were calibrated using 5 pesticide standards at 20, 50, 100, 200, and 500 μ g/L. The responses from each mixture were used to calculate the response factors (RFs) of each analyte. The average RF was used to calculate the concentrations of the pesticides in the samples. Quantification was based on the DB-608 column (signal 1), and identity of the analyte was confirmed using the Rtx-CLPesticides column (signal 2). A fingerprint chromatogram was run using each of the seven Aroclor mixtures and toxaphene; the calibration curves were run only if a particular PCB or toxaphene were found in the sample.

The pesticide/PCB results, listed in Table 1.9, were calculated from the following formula:

$$C_u = \frac{(DF)(A_u)(V_t)}{(RF_{ave})(V_i)(V_s)}$$

where;

C_u = Concentration of analyte ($\mu\text{g/L}$)
 DF = Dilution Factor
 A_u = Peak area or peak height
 V_t = Volume of sample (mL)
 RF_{ave} = Average response factor
 V_i = Volume of extract injected (μL)
 V_s = Sample volume (mL)

Response Factor calculation:

The response factor for each specific analyte is calculated using the peak area (peak height) from the continuing calibration check as follows:

$$RF = \frac{A_u}{\text{total pg injected}}$$

where:

A_u = Peak area or peak height

and

$$RF_{ave} = \frac{RF_1 + \dots + RF_n}{n}$$

where:

n = number of samples

Revision 3 9 00

Analytical Procedure for Metals in Water

Sample Preparation

A representative 45 mL aliquot of each sample was mixed with 5.0-mL concentrated nitric acid, placed in an acid rinsed Teflon container, capped with a Teflon lined cap, and digested according to SW-846, method 3015 in a CEM MDS-2100 microwave oven, which was programmed to bring the samples to 160 \pm 4°C in 10 minutes (first stage) and slowly to 165-170°C in the second 10 minutes (second stage). After digestion, the samples were allowed to cool to room temperature and were transferred to acid cleaned bottles. The samples were analyzed for all metals, except mercury, by US EPA SW-846, method 7000 Atomic Absorption (AA) or method 6010 Inductively Coupled Argon Plasma (ICAP) procedures.

A 100 mL aliquot of each sample was transferred to a 300-mL BOD bottle and prepared according to SW-846, method 7470. The samples were heated for 2 hours on a hot plate at 95°C, cooled to room temperature and reduced with hydroxylamine hydrochloride ($\text{NH}_2\text{OH}\cdot\text{HCl}$). Mercury was then analyzed separately on a Leeman Labs PS200II AA Spectrometer.

A reagent blank and a blank spike sample were carried through the sample preparation procedure for each analytical batch of samples processed. One matrix spike (MS) and one matrix spike duplicate (MSD) sample were also processed for each analytical batch or every 10 samples.

Analysis and Calculations

The AA, ICAP and Leeman Labs PS200II instruments were calibrated and operated according to SW-846, method 7000/7470/6010 and the manufacturer's operating instructions. After calibration, initial calibration verification (ICV), initial calibration blank (ICB), and QC check standards were run to verify proper calibration. The continuing calibration verification (CCV) and continuing calibration blank (CCB) standards were run after every 10 samples to verify proper operation during sample analysis.

The metal concentration in solution, in micrograms per liter ($\mu\text{g/L}$), was read directly from the read-out system of the instrument. ICAP and mercury results were taken directly from instrument read-outs. The ICAP results were corrected for digestion volume (45-mL sample + 5-mL nitric acid) prior to instrument read-out: AA read-outs (excluding mercury) were externally corrected for digestion volume ($1.1111 \times \text{AA read-out}$).

For samples that required dilution to fall within the instrument calibration range:

$$\mu\text{g/L metal in sample} = A [(C+B) / C]$$

where:

- A = direct read-out (ICAP and mercury)
- A = corrected read-out (AA)
- B = acid blank matrix used for dilution, mL
- C = sample aliquot, mL

Results of the analyses are listed in Table 1.10.

Revision 11/2/00

Analytical Procedure for Cyanide in Water

The subcontract laboratory determined the concentration of cyanide in the samples by analyzing them according to modified USEPA Method 9012 found in SW-846. The results of the analysis are listed in Table 1.11

Analytical Procedure for Total Petroleum Hydrocarbons in Water

The subcontract laboratory determined the concentration of total petroleum hydrocarbons in the samples by analyzing them according to modified USEPA Method 8015 found in SW-846. The results of the analysis are listed in Table 1.11

Table 1.1 Results of the Analysis for VOC in Water
WA # 0-141 Mills Gap Road

Sample # :	Water blank 082200		00312		00314		00304		00306	
Location :			Upper Spring		Sump		Lower Spring		Lower Spring dup.	
Collected :			08/16/00		08/17/00		08/16/00		08/16/00	
Analyzed :	08/22/00		08/22/00		08/22/00		08/22/00		08/22/00	
Injected :	11:49 AM		12:57 PM		1:34 pm		3:24 pm		4:01 pm	
File :	AV2105.D		AV2106.D		AV2107.D		AV2110.D		AV2111.D	
Dil. Fact. :	1		5		1		100		100	
	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l
Dichlorodifluoromethane	U	1.0	U	5.0	U	1.0	U	100	U	100
Chloromethane	U	1.0	U	5.0	U	1.0	U	100	U	100
Vinyl Chloride	U	1.0	U	5.0	U	1.0	U	100	U	100
Bromomethane	U	2.0	U	10	U	2.0	U	200	U	200
Chloroethane	U	1.0	U	5.0	U	1.0	U	100	U	100
Trichlorofluoromethane	U	1.0	U	5.0	U	1.0	U	100	U	100
Acetone	U	8.0	17	40	U	8.0	U	800	U	800
1,1-Dichloroethene	U	1.0	U	5.0	U	1.0	U	100	U	100
Methylene Chloride	U	1.0	U	5.0	U	1.0	U	100	U	100
Carbon Disulfide	U	1.0	U	5.0	U	1.0	U	100	U	100
Methyl-t-butyl Ether	U	1.0	U	5.0	U	1.0	U	100	U	100
trans-1,2-Dichloroethene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,1-Dichloroethane	U	1.0	5.1	5.0	U	1.0	U	100	U	100
2-Butanone	U	4.0	U	20	U	4.0	U	400	U	400
2,2-Dichloropropane	U	1.0	U	5.0	U	1.0	U	100	U	100
cis-1,2-Dichloroethene	U	1.0	330	5.0	U	1.0	400	100	420	100
Chloroform	1.2	1.0	U	5.0	U	1.0	120	100	120	100
1,1-Dichloropropene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,2-Dichloroethane	U	1.0	U	5.0	U	1.0	U	100	U	100
1,1,1-Trichloroethane	U	1.0	23	5.0	U	1.0	460	100	460	100
Carbon Tetrachloride	U	1.0	U	5.0	U	1.0	U	100	U	100
Benzene	U	1.0	9.9	5.0	U	1.0	110	100	100	100
Trichloroethene	U	1.0	23	5.0	11	1.0	11000	100	10000	100
1,2-Dichloropropane	U	1.0	U	5.0	U	1.0	U	100	U	100
Bromodichloromethane	U	1.0	U	5.0	U	1.0	U	100	U	100
Dibromomethane	U	1.0	U	5.0	U	1.0	U	100	U	100
cis-1,3-Dichloropropene	U	1.0	U	5.0	U	1.0	U	100	U	100
trans-1,3-Dichloropropene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,1,2-Trichloroethane	U	1.0	U	5.0	U	1.0	U	100	U	100
1,3-Dichloropropane	U	1.0	U	5.0	U	1.0	U	100	U	100
Dibromochloromethane	U	1.0	U	5.0	U	1.0	U	100	U	100
1,2-Dibromoethane	U	1.0	U	5.0	U	1.0	U	100	U	100
Bromoform	U	1.0	U	5.0	U	1.0	U	100	U	100
4-Methyl-2-Pentanone	U	2.0	U	10	U	2.0	U	200	U	200
Toluene	U	1.0	8.9	5.0	U	1.0	U	100	U	100
2-Hexanone	U	2.0	U	10	U	2.0	U	200	U	200
Tetrachloroethene	U	1.0	U	5.0	U	1.0	U	100	U	100
Chlorobenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,1,1,2-Tetrachloroethane	U	1.0	U	5.0	U	1.0	U	100	U	100
Ethylbenzene	U	1.0	5.1	5.0	U	1.0	U	100	U	100
p&m-Xylene	U	1.0	U	5.0	U	1.0	140	100	120	100
o-Xylene	U	1.0	11	5.0	U	1.0	U	100	U	100
Styrene	U	1.0	U	5.0	U	1.0	U	100	U	100
Isopropylbenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,1,2,2-Tetrachloroethane	U	1.0	U	5.0	U	1.0	U	100	U	100
1,2,3-Trichloropropane	U	1.0	U	5.0	U	1.0	U	100	U	100
n-Propylbenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
Bromobenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,3,5-Trimethylbenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
2-Chlorotoluene	U	1.0	U	5.0	U	1.0	U	100	U	100
4-Chlorotoluene	U	1.0	U	5.0	U	1.0	U	100	U	100
tert-Butylbenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,2,4-Trimethylbenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
sec-Butylbenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
p-Isopropyltoluene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,3-Dichlorobenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,4-Dichlorobenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
n-Butylbenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,2-Dichlorobenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,2-Dibromo-3-chloropropane	U	1.0	U	5.0	U	1.0	U	100	U	100
1,2,4-Trichlorobenzene	U	1.0	U	5.0	U	1.0	U	100	U	100
Hexachlorobutadiene	U	1.0	U	5.0	U	1.0	U	100	U	100
Naphthalene	U	1.0	U	5.0	U	1.0	U	100	U	100
1,2,3-Trichlorobenzene	U	1.0	U	5.0	U	1.0	U	100	U	100

Table 1.1 (cont.) Results of the Analysis for VOC in Water
WA # 0-141 Mills Gap Road

Sample # :	Water blank 082900		Lisenbee A-I		Schmidt A, B, C		Randall A, B, C	
Location :			32 Concord Road		55 Concord Road		42 Concord Road	
Collected :			08/17/00		08/17/00		08/17/00	
Analyzed :	08/29/00		08/29/00		08/29/00		08/29/00	
Injected :	1:10 pm		2:07 pm		3:58 pm		4:35 pm	
File :	AV2135.D		AV2136.D		AV2139.D		AV2140.D	
Dil. Fact. :	1		1		1		1	
	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l
Dichlorodifluoromethane	U	1.0	U	1.0	U	1.0	U	1.0
Chloromethane	U	1.0	U	1.0	U	1.0	U	1.0
Vinyl Chloride	U	1.0	U	1.0	U	1.0	U	1.0
Bromomethane	U	2.0	U	2.0	U	2.0	U	2.0
Chloroethane	U	1.0	U	1.0	U	1.0	U	1.0
Trichlorofluoromethane	U	1.0	U	1.0	U	1.0	U	1.0
Acetone	U	8.0	U	8.0	U	8.0	U	8.0
1,1-Dichloroethene	U	1.0	U	1.0	U	1.0	U	1.0
Methylene Chloride	U	1.0	U	1.0	U	1.0	U	1.0
Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0
Methyl-t-butyl Ether	U	1.0	U	1.0	U	1.0	U	1.0
trans-1,2-Dichloroethene	U	1.0	U	1.0	U	1.0	U	1.0
1,1-Dichloroethane	U	1.0	U	1.0	U	1.0	U	1.0
2-Butanone	U	4.0	U	4.0	U	4.0	U	4.0
2,2-Dichloropropane	U	1.0	U	1.0	U	1.0	U	1.0
cis-1,2-Dichloroethene	U	1.0	U	1.0	U	1.0	U	1.0
Chloroform	U	1.0	U	1.0	U	1.0	U	1.0
1,1-Dichloropropene	U	1.0	U	1.0	U	1.0	U	1.0
1,2-Dichloroethane	U	1.0	U	1.0	U	1.0	U	1.0
1,1,1-Trichloroethane	U	1.0	U	1.0	U	1.0	U	1.0
Carbon Tetrachloride	U	1.0	U	1.0	U	1.0	U	1.0
Benzene	U	1.0	U	1.0	U	1.0	U	1.0
Trichloroethene	U	1.0	U	1.0	U	1.0	U	1.0
1,2-Dichloropropane	U	1.0	U	1.0	U	1.0	U	1.0
Bromodichloromethane	U	1.0	U	1.0	U	1.0	U	1.0
Dibromomethane	U	1.0	U	1.0	U	1.0	U	1.0
cis-1,3-Dichloropropene	U	1.0	U	1.0	U	1.0	U	1.0
trans-1,3-Dichloropropene	U	1.0	U	1.0	U	1.0	U	1.0
1,1,2-Trichloroethane	U	1.0	U	1.0	U	1.0	U	1.0
1,3-Dichloropropane	U	1.0	U	1.0	U	1.0	U	1.0
Dibromochloromethane	U	1.0	U	1.0	U	1.0	U	1.0
1,2-Dibromoethane	U	1.0	U	1.0	U	1.0	U	1.0
Bromoform	U	1.0	U	1.0	U	1.0	U	1.0
4-Methyl-2-Pentanone	U	2.0	U	2.0	U	2.0	U	2.0
Toluene	U	1.0	U	1.0	U	1.0	U	1.0
2-Hexanone	U	2.0	U	2.0	U	2.0	U	2.0
Tetrachloroethene	U	1.0	U	1.0	U	1.0	U	1.0
Chlorobenzene	U	1.0	U	1.0	U	1.0	U	1.0
1,1,1,2-Tetrachloroethane	U	1.0	U	1.0	U	1.0	U	1.0
Ethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0
p&m-Xylene	U	1.0	U	1.0	U	1.0	U	1.0
o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0
Styrene	U	1.0	U	1.0	U	1.0	U	1.0
Isopropylbenzene	U	1.0	U	1.0	U	1.0	U	1.0
1,1,2,2-Tetrachloroethane	U	1.0	U	1.0	U	1.0	U	1.0
1,2,3-Trichloropropane	U	1.0	U	1.0	U	1.0	U	1.0
n-Propylbenzene	U	1.0	U	1.0	U	1.0	U	1.0
Bromobenzene	U	1.0	U	1.0	U	1.0	U	1.0
1,3,5-Tnmethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0
2-Chlorotoluene	U	1.0	U	1.0	U	1.0	U	1.0
4-Chlorotoluene	U	1.0	U	1.0	U	1.0	U	1.0
tert-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0
1,2,4-Tnmethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0
sec-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0
p-Isopropyltoluene	U	1.0	U	1.0	U	1.0	U	1.0
1,3-Dichlorobenzene	U	1.0	U	1.0	U	1.0	U	1.0
1,4-Dichlorobenzene	U	1.0	U	1.0	U	1.0	U	1.0
n-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0
1,2-Dichlorobenzene	U	1.0	U	1.0	U	1.0	U	1.0
1,2-Dibromo-3-chloropropane	U	1.0	U	1.0	U	1.0	U	1.0
1,2,4-Trichlorobenzene	U	1.0	U	1.0	U	1.0	U	1.0
Hexachlorobutadiene	U	1.0	U	1.0	U	1.0	U	1.0
Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0
1,2,3-Trichlorobenzene	U	1.0	U	1.0	U	1.0	U	1.0

Table 1.2 Results of TIC for VOC in Water
WA # 0-141 Mills Gap Road

Sample ID	Compound
Water blank 082200	No Peaks Found
00312	No Peaks Found
00314	No Peaks Found
00304	No Peaks Found
00306	No Peaks Found
Water blank 082900	No Peaks Found
Lisenbee A-I	No Peaks Found
Schmidt A, B, C	No Peaks Found
Randall A, B, C	No Peaks Found

Table 1.3 Results of the Analysis for VOC in Soil
WA # 0-141 Mills Gap Road
Based on Dry Weight

Sample # :	Soil blank 091500		00615		00617	
Location :			Trench 1		Trench 8	
Collected :			09/12/00		09/12/00	
Analyzed :	09/15/00		09/15/00		09/15/00	
Injected :	4:49 pm		7:16 pm		9:06 pm	
File :	AV2230.D		AV2234.D		AV2237.D	
Dil. Fact. :	1		1		1	
	Conc.	MDL	Conc.	MDL	Conc.	MDL
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dichlorodifluoromethane	U	1.0	2.1	1.1	2.0	1.2
Chloromethane	U	1.0	U	1.1	U	1.2
Vinyl Chloride	U	1.0	U	1.1	U	1.2
Bromomethane	U	2.0	U	2.2	U	2.4
Chloroethane	U	1.0	U	1.1	U	1.2
Trichlorofluoromethane	U	1.0	U	1.1	U	1.2
Acetone	1.2 J	8.0	47 B	8.7	9.5 JB	9.6
1,1-Dichloroethene	U	1.0	U	1.1	U	1.2
Methylene Chloride	U	1.0	U	1.1	U	1.2
Carbon Disulfide	U	1.0	4.7	1.1	U	1.2
Methyl-t-butyl Ether	U	1.0	U	1.1	U	1.2
trans-1,2-Dichloroethene	U	1.0	U	1.1	U	1.2
1,1-Dichloroethane	U	1.0	U	1.1	U	1.2
2-Butanone	U	4.0	5.5	4.3	U	4.8
2,2-Dichloropropane	U	1.0	U	1.1	U	1.2
cis-1,2-Dichloroethene	U	1.0	U	1.1	U	1.2
Chloroform	U	1.0	U	1.1	U	1.2
1,1-Dichloropropene	U	1.0	U	1.1	U	1.2
1,2-Dichloroethane	U	1.0	U	1.1	U	1.2
1,1,1-Trichloroethane	U	1.0	U	1.1	U	1.2
Carbon Tetrachloride	U	1.0	U	1.1	U	1.2
Benzene	U	1.0	U	1.1	U	1.2
Trichloroethene	U	1.0	4.9	1.1	35	1.2
1,2-Dichloropropane	U	1.0	U	1.1	U	1.2
Bromodichloromethane	U	1.0	U	1.1	U	1.2
Dibromomethane	U	1.0	U	1.1	U	1.2
cis-1,3-Dichloropropene	U	1.0	U	1.1	U	1.2
trans-1,3-Dichloropropene	U	1.0	U	1.1	U	1.2
1,1,2-Trichloroethane	U	1.0	U	1.1	U	1.2
1,3-Dichloropropane	U	1.0	U	1.1	U	1.2
Dibromochloromethane	U	1.0	U	1.1	U	1.2
1,2-Dibromoethane	U	1.0	U	1.1	U	1.2
Bromoform	U	1.0	U	1.1	U	1.2
4-Methyl-2-Pentanone	U	2.0	U	2.2	U	2.4
Toluene	U	1.0	4.9	1.1	U	1.2
2-Hexanone	U	2.0	U	2.2	U	2.4
Tetrachloroethene	U	1.0	U	1.1	U	1.2
Chlorobenzene	U	1.0	U	1.1	U	1.2
1,1,1,2-Tetrachloroethane	U	1.0	U	1.1	U	1.2
Ethylbenzene	U	1.0	3.4	1.1	U	1.2
p&m-Xylene	U	1.0	5.5	1.1	U	1.2
o-Xylene	U	1.0	4.8	1.1	U	1.2
Styrene	U	1.0	U	1.1	U	1.2
Isopropylbenzene	U	1.0	U	1.1	U	1.2
1,1,2,2-Tetrachloroethane	U	1.0	U	1.1	U	1.2
1,2,3-Trichloropropane	U	1.0	U	1.1	U	1.2
n-Propylbenzene	U	1.0	1.9	1.1	U	1.2
Bromobenzene	U	1.0	U	1.1	U	1.2
1,3,5-Trimethylbenzene	U	1.0	9.9	1.1	1.7	1.2
2-Chlorotoluene	U	1.0	U	1.1	U	1.2
4-Chlorotoluene	U	1.0	U	1.1	U	1.2
tert-Butylbenzene	U	1.0	U	1.1	U	1.2
1,2,4-Trimethylbenzene	U	1.0	22	1.1	4.3	1.2
sec-Butylbenzene	U	1.0	2.8	1.1	2.1	1.2
p-Isopropyltoluene	U	1.0	3.5	1.1	1.6	1.2
1,3-Dichlorobenzene	U	1.0	U	1.1	U	1.2
1,4-Dichlorobenzene	U	1.0	U	1.1	U	1.2
n-Butylbenzene	U	1.0	U	1.1	5.0	1.2
1,2-Dichlorobenzene	U	1.0	U	1.1	U	1.2
1,2-Dibromo-3-chloropropane	U	1.0	U	1.1	U	1.2
1,2,4-Trichlorobenzene	U	1.0	U	1.1	U	1.2
Hexachlorobutadiene	U	1.0	U	1.1	U	1.2
Naphthalene	U	1.0	33	1.1	3.4	1.2
1,2,3-Trichlorobenzene	U	1.0	U	1.1	U	1.2

Table 1.4 Results of TIC for VOC in Soil
WA # 0-141 Mills Gap Road

Sample ID	Compound
Soil blank 091500	No Peaks Found
Soil blank 091800	No Peaks Found

Table 1.4 (cont.) Results of TIC for VOC in Soil
WA # 0-141 Mills Gap Road

Sample #	00615	Unit	µg/Kg		
LabFile#	AV2234	Con. Factor	1.1		
	CAS#	Compound	Q	RT	Conc
1		C8 Alkene		11.06	32
2		Unknown		14.73	11
3		Unknown		14.84	7
4		Unknown		15.05	8
5		C10 Alkane		16.45	23
6		Unknown		17.04	84
7		C10 Alkane		17.31	33
8		Unknown		17.85	11
9	124-18-5	Decane	97	17.99	55
10		C11 Alkane		18.54	35
11		C9 Alkyl benzene		18.96	23
12		Unknown		19.50	46
13		C11 Alkane		19.87	100
14		C11-C12 Alkane		20.55	71
15		Unknown Alkane		22.05	180
16		C13 Alkane		22.78	104
17		Unknown alkane		23.77	83
18		Unknown phenol		28.96	42
19					
20					

*Estimated Concentration (Response Factor = 1.0)

Table 1.4 (cont.) Results of TIC for VOC in Soil
WA # 0-141 Mills Gap Road

Sample #	00617	Unit	µg/Kg		
LabFile#	AV2237	Con. Factor	1.2		
	CAS#	Compound	Q	RT	Conc
1		C9 Cycloalkane		15.97	15
2		C10 Alkane		16.46	15
3		Unknown		16.73	11
4		Alkyl Cyclohexane		17.04	45
5		C10 Alkane		17.31	11
6		C10 Alkane	90	18.00	8
7		Unknown		18.54	13
8		Unknown cycloalkane		18.95	9
9		C11 Alkane		19.51	15
10		C11 Alkane		19.87	35
11		C11 Alkane		20.55	46
12		Unknown		22.05	61
13		C10 Alkyl benzene + unknown phthalate		22.36	7
14		C12 Alkane	96	22.58	57
15		C13 Alkane	97	24.27	58
16		C14 Alkane	98	25.98	23
17		C11 Methyl naphthalene isomer + unknown		26.43	19
18		C11 Methyl naphthalene isomer + unknown		26.98	19
19		Unknown Alkane	87	28.10	8
20		C12 Dimethyl naphthalene isomer + unknown		28.97	

*Estimated Concentration (Response Factor = 1.0)

Table 1.5 Results of the Analysis for BNA in Water
WA # 0-141 Mills Gap Road

Sample No.	WBLK082100		A,B,C 00315		A,B,E 00301		A,B,D,E 00302		A,B,C 00309	
Sample Location	Lab Blank		Sump		Lower Spring Dup		Lower Spring		Upper Spring	
GC/MS File Name	MIL003		MIL004		MIL005		MIL006		MIL009	
Matrix	Water		Water		Water		Water		Water	
Dilution Factor	1		1		1		1		1	
	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Compound Name	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Phenol	U	10	U	11	U	10	U	11	U	11
bis(-2-Chloroethyl)Ether	U	10	U	11	U	10	U	11	U	11
2-Chlorophenol	U	10	U	11	U	10	U	11	U	11
1,3-Dichlorobenzene	U	10	U	11	U	10	U	11	U	11
1,4-Dichlorobenzene	U	10	U	11	U	10	U	11	U	11
Benzyl alcohol	U	10	U	11	5.0 J	10	3.9 J	11	U	11
1,2-Dichlorobenzene	U	10	U	11	U	10	U	11	U	11
2-Methylphenol	U	10	U	11	U	10	U	11	U	11
bis(2-Chloroisopropyl)ether	U	10	U	11	U	10	U	11	U	11
4-Methylphenol	U	10	U	11	U	10	U	11	U	11
N-Nitroso-Di-n-propylamine	U	10	U	11	U	10	U	11	U	11
Hexachloroethane	U	10	U	11	U	10	U	11	U	11
Nitrobenzene	U	10	U	11	U	10	U	11	U	11
Isophorone	U	10	U	11	U	10	U	11	U	11
2-Nitrophenol	U	10	U	11	U	10	U	11	U	11
2,4-Dimethylphenol	U	10	U	11	U	10	U	11	U	11
bis(2-Chloroethoxy)methane	U	10	U	11	U	10	U	11	U	11
2,4-Dichlorophenol	U	10	U	11	U	10	U	11	U	11
1,2,4-Trichlorobenzene	U	10	U	11	U	10	U	11	U	11
Naphthalene	U	10	U	63	10	17	11	U	11	11
4-Chloroaniline	U	10	U	11	U	10	U	11	U	11
Hexachlorobutadiene	U	10	U	11	U	10	U	11	U	11
4-Chloro-3-methylphenol	U	10	U	11	U	10	U	11	U	11
2-Methylnaphthalene	U	10	U	11	U	72	11	U	11	11
Hexachlorocyclopentadiene	U	10	U	11	U	10	U	11	U	11
2,4,6-Trichlorophenol	U	10	U	11	U	10	U	11	U	11
2,4,5-Trichlorophenol	U	10	U	11	U	10	U	11	U	11
2-Chloronaphthalene	U	10	U	11	U	10	U	11	U	11
2-Nitroaniline	U	10	U	11	U	10	U	11	U	11
Dimethylphthalate	U	10	U	11	U	10	U	11	U	11
Acenaphthylene	U	10	U	11	U	10	U	11	U	11
2,6-Dinitrotoluene	U	10	U	11	U	10	U	11	U	11
3-Nitroaniline	U	10	U	11	U	10	U	11	U	11
Acenaphthene	U	10	U	11	U	10	U	11	U	11
2,4-Dinitrophenol	U	10	U	11	U	10	U	11	U	11
4-Nitrophenol	U	10	U	11	U	10	U	11	U	11
Dibenzofuran	U	10	U	11	U	10	U	11	U	11
2,4-Dinitrotoluene	U	10	U	11	U	10	U	11	U	11
Diethylphthalate	U	10	U	11	U	10	U	11	U	11
4-Chlorophenyl-phenylether	U	10	U	11	U	10	U	11	U	11
Fluorene	U	10	U	11	U	10	U	11	U	11
4-Nitroaniline	U	10	U	11	U	10	U	11	U	11
4,6-Dinitro-2-methylphenol	U	10	U	11	U	10	U	11	U	11
N-Nitrosodiphenylamine	U	10	U	11	U	10	U	11	U	11
4-Bromophenyl-phenylether	U	10	U	11	U	10	U	11	U	11
Hexachlorobenzene	U	10	U	11	U	10	U	11	U	11
Pentachlorophenol	U	10	U	11	U	10	U	11	U	11
Phenanthrene	U	10	U	11	5.1 J	10	4.2 J	11	53	11
Anthracene	U	10	U	11	U	10	U	11	U	11
Carbazole	U	10	U	11	U	10	U	11	U	11
Di-n-butylphthalate	U	10	U	11	U	10	U	11	U	11
Fluoranthene	U	10	U	11	U	10	U	11	U	11
Pyrene	U	10	U	11	U	10	U	11	17	11
Butylbenzylphthalate	U	10	U	11	U	10	U	11	U	11
Benzo(a)anthracene	U	10	U	11	U	10	U	11	U	11
3,3'-Dichlorobenzidine	U	10	U	11	U	10	U	11	U	11
Chrysene	U	10	U	11	U	10	U	11	U	11
Bis(2-Ethylhexyl)phthalate	U	10	U	11	U	10	U	11	U	11
Di-n-octylphthalate	U	10	U	11	U	10	U	11	U	11
Benzo(b)fluoranthene	U	10	U	11	U	10	U	11	U	11
Benzo(k)fluoranthene	U	10	U	11	U	10	U	11	U	11
Benzo(a)pyrene	U	10	U	11	U	10	U	11	U	11
Indeno(1,2,3-cd)pyrene	U	10	U	11	U	10	U	11	U	11
Dibenzo(a,h)anthracene	U	10	U	11	U	10	U	11	U	11
Benzo(g,h,i)perylene	U	10	U	11	U	10	U	11	U	11

Table 1.6 Results of TIC for BNA in Water
WA # 0-141 Mills Gap Road

Sample #	LabFile#	WBLK082100	MIL003	Con. Factor	1.0
	CAS#	Compound	Q	RT	Conc.* µg/L
1		Acid		8.94	5
2		Acid		13.54	4
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.6 (cont.) Results of TIC for BNA in Water
WA # 0-141 Mills Gap Road

Sample #	A,B,C 00315	Con. Factor	1.1		
LabFile#	MIL004				
	CAS#	Compound	Q	RT	Conc.* µg/L
1		Acid		13.54	6
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.6 (cont.) Results of TIC for BNA in Water
WA # 0-141 Mills Gap Road

Sample #	LabFile#	A.B.E 00301	MIL005	Con. Factor	1.0
	CAS#	Compound	Q	RT	Conc.* µg/L
1	000100-41-4	Ethylbenzene	95	4.17	67
2		Dimethyl-benzene isomer		4.47	120
3		Trimethyl-benzene isomer		5.34	110
4		Dihydro-methyl-indene isomer		6.71	87
5		Methylphenyl-ethanone isomer		6.84	65
6		Unknown PAH alcohol		7.34	97
7		Phenol isomer		7.59	58
8		Dihydro-indenone isomer		7.75	180
9		Methyl-naphthalene isomer		8.01	160
10		Alkyl benzene + ketone		8.08	54
11		Unknown		8.97	63
12		Unknown		10.35	85
13		Unknown		10.42	61
14		Unknown		10.56	220
15		Unknown		10.68	59
16		Unknown		10.92	64
17		Unknown		10.96	65
18		Unknown		11.14	250
19		Unknown		11.56	86
20	000548-39-0	1H-Phenalen-1-one	98	11.78	52

* Estimated Concentration (Response Factor = 1)

Table 1.6 (cont.) Results of TIC for BNA in Water
WA # 0-141 Mills Gap Road

Sample #	A.B.D,E 00302		Con. Factor		1.1
LabFile#	MIL006				
	CAS#	Compound	Q	RT	Conc.* µg/L
1	000100-41-4	Ethylbenzene	95	4.17	61
2		Dimethylbenzene isomer		4.47	110
3		Trimethylbenzene isomer		5.34	99
4		Dihydro-methyl-indene isomer		6.71	87
5		Methylphenyl-ethanone isomer		6.84	68
6		Unknown PAH alcohol		7.34	100
7		Unknown		7.59	63
8		Dihydro-indenone isomer		7.75	190
9		Methyl-naphthalene isomer		8.01	180
10		Alkyl benzene + unknown		8.04	81
11		Alkyl benzene + ketone		8.08	58
12		Unknown		8.26	54
13		Dihydro-naphthalenone isomer		8.46	53
14		Unknown		8.97	66
15		Unknown		10.35	100
16		Unknown		10.41	56
17		Unknown		10.56	180
18		Unknown		10.69	54
19		Unknown		10.92	67
20		Unknown		11.14	220

* Estimated Concentration (Response Factor = 1)

Table 1.6 (cont.) Results of TIC for BNA in Water
WA # 0-141 Mills Gap Road

Sample #	A,B,C 00309	Con. Factor	1.1		
LabFile#	MIL009				
	CAS#	Compound	Q	RT	Conc.* µg/L
1		Alkane		6.09	93
2		Alkane		6.88	210
3		Alkene/cycloalkane		7.28	130
4		Alkane		7.41	190
5		Alkane		7.62	490
6		Alkane		7.97	92
7		PAH isomer		7.99	120
8		Unknown		8.03	170
9		Alkane		8.06	90
10		Alkane		8.73	100
11		Alkane		8.99	150
12		Alkane		9.60	170
13		Alkane		10.19	220
14		Alkane		10.22	150
15		PAH isomer + unknown		10.62	95
16		Alkane		10.74	140
17		Alkane		10.79	91
18		Alkane		11.74	160
19		Alkane		12.22	100
20		Alkane		13.10	86

* Estimated Concentration (Response Factor = 1)

Table 1.7 Results of the Analysis for BNA in Soil
WA # 0-141 Mills Gap Road
(Results are Based on Dry Weight)

Sample No.	SBLK091500	615	617
Sample Location	Lab Blank	Trench 1	Trench 8
GC/MS File Name	MIL012	MIL013	MIL014
Matrix	Soil	Soil	Soil
Dilution Factor	1	5	1
% Solid	100	95	89

Compound Name	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg
Phenol	U	330	U	1800	U	370
bis(-2-Chloroethyl)Ether	U	330	U	1800	U	370
2-Chlorophenol	U	330	U	1800	U	370
1,3-Dichlorobenzene	U	330	U	1800	U	370
1,4-Dichlorobenzene	U	330	U	1800	U	370
Benzyl alcohol	U	330	U	1800	U	370
1,2-Dichlorobenzene	U	330	U	1800	U	370
2-Methylphenol	U	330	U	1800	U	370
bis(2-Chloroisopropyl)ether	U	330	U	1800	U	370
4-Methylphenol	U	330	U	1800	U	370
N-Nitroso-Di-n-propylamine	U	330	U	1800	U	370
Hexachloroethane	U	330	U	1800	U	370
Nitrobenzene	U	330	U	1800	U	370
Isophorone	U	330	U	1800	U	370
2-Nitrophenol	U	330	U	1800	U	370
2,4-Dimethylphenol	U	330	U	1800	U	370
bis(2-Chloroethoxy)methane	U	330	U	1800	U	370
2,4-Dichlorophenol	U	330	U	1800	U	370
1,2,4-Trichlorobenzene	U	330	U	1800	U	370
Naphthalene	U	330	200 J	1800	U	370
4-Chloroaniline	U	330	U	1800	U	370
Hexachlorobutadiene	U	330	U	1800	U	370
4-Chloro-3-methylphenol	U	330	U	1800	U	370
2-Methylnaphthalene	U	330	760 J	1800	U	370
Hexachlorocyclopentadiene	U	330	U	1800	U	370
2,4,6-Trichlorophenol	U	330	U	1800	U	370
2,4,5-Trichlorophenol	U	330	U	1800	U	370
2-Chloronaphthalene	U	330	U	1800	U	370
2-Nitroaniline	U	330	U	1800	U	370
Dimethylphthalate	U	330	U	1800	U	370
Acenaphthylene	U	330	U	1800	U	370
2,6-Dinitrotoluene	U	330	U	1800	U	370
3-Nitroaniline	U	330	U	1800	U	370
Acenaphthene	U	330	U	1800	U	370
2,4-Dinitrophenol	U	330	U	1800	U	370
4-Nitrophenol	U	330	U	1800	U	370
Dibenzofuran	U	330	U	1800	U	370
2,4-Dinitrotoluene	U	330	U	1800	U	370
Diethylphthalate	U	330	U	1800	U	370
4-Chlorophenyl-phenylether	U	330	U	1800	U	370
Fluorene	U	330	U	1800	U	370
4-Nitroaniline	U	330	U	1800	U	370
4,6-Dinitro-2-methylphenol	U	330	U	1800	U	370
N-Nitrosodiphenylamine	U	330	U	1800	U	370
4-Bromophenyl-phenylether	U	330	U	1800	U	370
Hexachlorobenzene	U	330	U	1800	U	370
Pentachlorophenol	U	330	U	1800	U	370
Phenanthrene	U	330	U	1800	U	370
Anthracene	U	330	U	1800	U	370
Carbazole	U	330	U	1800	U	370
Di-n-butylphthalate	U	330	U	1800	U	370
Fluoranthene	U	330	U	1800	U	370
Pyrene	U	330	U	1800	U	370
Butylbenzylphthalate	U	330	U	1800	U	370
Benzo(a)anthracene	U	330	U	1800	U	370
3,3'-Dichlorobenzidine	U	330	U	1800	U	370
Chrysene	U	330	U	1800	U	370
Bis(2-Ethylhexyl)phthalate	U	330	590 J	1800	900	370
Di-n-octylphthalate	U	330	U	1800	U	370
Benzo(b)fluoranthene	U	330	U	1800	U	370
Benzo(k)fluoranthene	U	330	U	1800	U	370
Benzo(a)pyrene	U	330	U	1800	U	370
Indeno(1,2,3-cd)pyrene	U	330	U	1800	U	370
Dibenzo(a,h)anthracene	U	330	U	1800	U	370
Benzo(g,h,i)perylene	U	330	U	1800	U	370

Table 1.8 Results of TIC for BNA in Soil
WA # 0-141 Mills Gap Road

Sample #	SBLK091500	Con. Factor	33		
LabFile#	MIL012				
	CAS#	Compound	Q	RT	Conc.* µg/kg
1		No TICs were detected			
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.8 (cont.) Results of TIC for BNA in Soil
WA # 0-141 Mills Gap Road

Sample #	615	Con. Factor	176		
LabFile#	MIL013				
	CAS#	Compound	Q	RT	Conc.* µg/kg
1		Cycloalkane isomer		6.48	3600
2		Alkane		6.53	3300
3		Unknown		7.18	4400
4		Cycloalkane isomer		7.27	11000
5		Alkane		7.31	4500
6		Unknown		7.58	3900
7		Cycloalkane isomer		7.63	5200
8		Alkane		7.68	4500
9		Alkane		7.74	6200
10		Alkane		7.95	4800
11		Alkene + alkane		8.01	14000
12		Alkane		8.10	3400
13		Alkane		8.14	9400
14		Alkane		8.70	11000
15		Cycloalkane isomer		8.73	4100
16		Phenol, bis(1,1-dimethylethyl)- i		8.76	57000
17		Unknown		8.95	3500
18		Unknown		9.02	9200
19		Alkane		10.74	5200
20		Unknown		12.18	3900

* Estimated Concentration (Response Factor = 1)

Table 1.8 (cont.) Results of TIC for BNA in Soil
WA # 0-141 Mills Gap Road

Sample #	617	Con. Factor	37		
LabFile#	MIL014				
	CAS#	Compound	Q	RT	Conc.* µg/kg
1		Alkane		7.40	250
2		Alkane		7.60	530
3		Alkane + alkene		8.01	200
4		Alkane		8.14	270
5		Alkane		8.70	700
6		Alkane + unknown		8.77	250
7		Alkane		8.94	1100
8		Cycloalkane + unknown		9.02	320
9		Alkane		9.33	180
10		Cycloalkane + unknown		9.38	230
11		Alkane		9.55	1500
12		Alkane		9.84	880
13		Alkane + alkene		9.90	180
14		Alkane		10.38	250
15		Alkane		10.69	1300
16		Alkane		10.75	740
17		Alkane		11.21	1000
18		Alkane		11.71	930
19		Alkane		12.18	540
20		Alkane		12.64	320

* Estimated Concentration (Response Factor = 1)

Table 1.9 Results of the Analysis for Pesticide/PCBs in Water
WA # 0-141 Mills Gap Road

Client ID Location	WBLK081800		A,B,C00315 Sump		A,B,E00301 Lower Spring Dup		A,B,D,E00302 Lower Spring		A,B,C00309 Upper Spring	
Analyte	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L
a-BHC	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
g-BHC	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
b-BHC	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Heptachlor	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
d-BHC	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Aldrin	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Heptachlor Epoxide	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
g-Chlordane	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
a-Chlordane	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Endosulfan (I)	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
p,p'-D D E	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Dieldrin	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Endrin	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
p,p'-D D D	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Endosulfan (II)	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
p,p'-D D T	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Endrin Aldehyde	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Endosulfan Sulfate	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Methoxychlor	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Endrin Ketone	U	0.02	U	0.02	U	0.04	U	0.04	U	0.06
Toxaphene	U	0.5	U	0.5	U	1.0	U	1.0	U	1.6
Aroclor 1016	U	0.3	U	0.3	U	0.5	U	0.5	U	0.8
Aroclor 1221	U	0.5	U	0.5	U	1.0	U	1.0	U	1.6
Aroclor 1232	U	0.3	U	0.3	U	0.5	U	0.5	U	0.8
Aroclor 1242	U	0.3	U	0.3	U	0.5	U	0.5	U	0.8
Aroclor 1248	U	0.3	U	0.3	U	0.5	U	0.5	U	0.8
Aroclor 1254	U	0.3	U	0.3	U	0.5	U	0.5	U	0.8
Aroclor 1260	U	0.3	U	0.3	U	0.5	U	0.5	U	0.8
Aroclor 1268	U	0.3	U	0.3	U	0.5	U	0.5	U	0.8

Table 1.10 Results of the Analysis for Metals in Water
WA # 0-141 Mills Gap Road

Client ID Location		Method Blank Lab		A00313 Sump		A00305 Lower Spring		A00311 Upper Spring	
Parameter	Analysis Method	Conc µg/L	MDL µg/L	Conc µg/L	MDL µg/L	Conc µg/L	MDL µg/L	Conc µg/L	MDL µg/L
Aluminum	ICAP	U	50	130	50	110	50	46000	50
Antimony	AA-Fur	U	2.2	U	2.2	U	2.2	U	2.2
Arsenic	AA-Fur	U	5.6	U	5.6	U	5.6	U	5.6
Barium	ICAP	U	5.0	U	5.0	72	5.0	270	5.0
Beryllium	ICAP	U	2.0	U	2.0	U	2.0	U	2.0
Cadmium	ICAP	U	5.0	U	5.0	U	5.0	U	5.0
Calcium	ICAP	U	100	19000	100	3700	100	3500	100
Chromium	ICAP	U	5.0	20	5.0	U	5.0	36	5.0
Cobalt	ICAP	U	10	U	10	23	10	U	10
Copper	ICAP	U	10	37	10	U	10	29	10
Iron	ICAP	U	25	810	25	110	25	27000	25
Lead	AA-Fur	U	2.2	12	2.2	U	2.2	18	2.2
Magnesium	ICAP	U	500	860	500	1800	500	3400	500
Manganese	ICAP	U	5.0	13	5.0	370	5.0	330	5.0
Mercury	Cold Vapor	U	0.20	U	0.20	U	0.20	U	0.20
Nickel	ICAP	U	10	180	10	U	10	21	10
Potassium	ICAP	U	2000	16000	2000	U	2000	5000	2000
Selenium	AA-Fur	U	5.6	U	5.6	U	5.6	U	5.6
Silver	ICAP	U	5.0	8.9	5.0	U	5.0	U	5.0
Sodium	ICAP	U	500	13000	500	2400	500	1600	500
Thallium	AA-Fur	U	2.2	U	2.2	U	2.2	U	2.2
Vanadium	ICAP	U	10	U	10	U	10	50	10
Zinc	ICAP	U	10	370	10	22	10	82	10

Table 1.11 Results of the Analysis for Cyanide, TPH and Oil Fingerprint in Water
WA # 0-141 Mills Gap Road

Sample Number	Sampling Location	Cyanide µg/L	MDL µg/L	TPH µg/L	MDL µg/L	Oil Fingerprint
Method Blank	-	U	10	U	280	-
A 00316	Sump	U	10	NR	NR	NR
A, B 00307	Lower Spring	NR	NR	16000	2900	**
A, B 00308	Upper Spring	NR	NR	200000	30000	Fuel Oil #2

** The chromatography pattern of this sample did not match or resemble any of the patterns from the initial calibration, the pattern did elute within the retention time window of Fuel Oil #2

QA/QC for VOC

Results of the Internal Standard Areas and Surrogate Percent Recoveries for VOC in Water

Each sample was spiked with a three component mixture of CLP surrogate standards consisting of toluene- d_8 , 4-bromofluorobenzene and 1,2-dichloroethane- d_4 . The surrogate percent recoveries, listed in Table 2.1, ranged from 87 to 111. All thirty-nine values were within the acceptable QC limits. The internal standard areas (for bromochloromethane, 1,4-difluorobenzene, and chlorobenzene- d_5) are also listed in Table 2.1. All thirty-nine values areas were within the acceptable QC limits.

Results of the MS/MSD Analysis for VOC in Water

Samples 00314 and Lisenbee A, B, C were chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, ranging from 89 to 138, are listed in Table 2.2. All twenty values were within the acceptable QC limits. The relative percent differences, also listed in Table 2.2, ranged from 0 (zero) to 19 and nine out of ten values were within the acceptable QC limits.

Results of the Internal Standard Areas and Surrogate Percent Recoveries for VOC in Soil

Each sample was spiked with a three component mixture of CLP surrogate standards consisting of toluene- d_8 , 4-bromofluorobenzene and 1,2-dichloroethane- d_4 . The surrogate percent recoveries, listed in Table 2.3, ranged from 70 to 116. All twenty-four values were within the acceptable QC limits. The internal standard areas (for bromochloromethane, 1,4-difluorobenzene, and chlorobenzene- d_5) are also listed in Table 2.3. Twenty-three out of twenty-four values areas were within the acceptable QC limits.

Results of the MS/MSD Analysis for VOC in Soil

Sample 00617 was chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, ranging from 41 to 102, are listed in Table 2.4. Eight out of ten values were within the acceptable QC limits. The relative percent differences, also listed in Table 2.4, ranged from 1 to 6 and all five values were within the acceptable QC limits.

Table 2.1 Results of the Internal Standard Areas and Surrogate Percent Recoveries for VOC in Water
WA # 0-141 Mills Gap Road

File ID	Sample No.	IS 1	IS 2	IS 3	Surr. 1	Surr. 2	Surr. 3
Cal Check Area	AV2104.D	392594	3098700	1698370			
AV2105.D	Water blank 082200	373818	3008395	1549530	101	104	88
AV2106.D	00312/5x	362230	2824199	1463655	102	104	92
AV2107.D	00314	323317	2608908	1389225	104	103	89
AV2108.D	00314 MS	294061	2499722	1348920	109	101	88
AV2109.D	00314 MSD	288800	2393253	1307675	109	100	88
AV2110.D	00304/100x	276125	2265919	1203487	109	103	90
AV2111.D	00306/100x	272047	2255516	1209115	111	102	91
Cal Check Area	AV2134.D	568447	4495340	2663540			
AV2135.D	Water blank 082900	502549	4145156	2366940	102	103	89
AV2136.D	Lisenbee A-I	469558	3834549	2194918	103	103	88
AV2137.D	Lisenbee MS	435051	3653053	2116334	105	101	87
AV2138.D	Lisenbee MSD	443081	3629589	2124136	106	101	87
AV2139.D	Schmidt A, B, C	395172	3315611	1905685	109	103	87
AV2140.D	Randall A, B, C	393303	3228251	1842085	108	104	87

IS 1 Bromochloromethane
IS 2 1,4-Difluorobenzene
IS 3 Chlorobenzene-d5

Surr. 1 1,2-Dichloroethane-d4 76 - 114
Surr. 2 Toluene-d8 88 - 110
Surr. 3 p-Bromofluorobenzene 86 - 115

Table 2.2 Results of MS/MSD Analysis for VOC in Water
WA # 0-141 Mills Gap Road

Sample ID: 00314

Compound Name	Sample Conc. µg/L	MS Spike Added µg/L	MSD Spike Added µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Rec.	MSD % Rec.	RPD	QC Limits RPD	% Rec.
1,1-Dichloroethene	U	50.0	50.0	58.7	57.6	117	115	2	14	61 - 145
Benzene	U	50.0	50.0	47.2	47.2	94	94	0	11	76 - 127
Trichloroethene	11.5	50.0	50.0	56.2	57.3	89	92	2	14	71 - 120
Toluene	U	50.0	50.0	47.4	47.3	95	95	0	13	76 - 125
Chlorobenzene	U	50.0	50.0	45.1	45.3	90	91	0	13	75 - 130

Sample ID: Lisenbee A-I

Compound Name	Sample Conc. µg/L	MS Spike Added µg/L	MSD Spike Added µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Rec.	MSD % Rec.	RPD	QC Limits RPD	% Rec.
1,1-Dichloroethene	U	50.0	50.0	56.9	68.8	114	138	19 *	14	61 - 145
Benzene	U	50.0	50.0	50.6	48.9	101	98	3	11	76 - 127
Trichloroethene	U	50.0	50.0	47.9	46.1	96	92	4	14	71 - 120
Toluene	U	50.0	50.0	50.3	48.7	101	97	3	13	76 - 125
Chlorobenzene	U	50.0	50.0	46.9	46.0	94	92	2	13	75 - 130

Table 2.3 Results of the Internal Standard Areas and Surrogate Percent Recoveries for VOC in Soil
WA # 0-141 Mills Gap Road

File ID	Sample No.	IS 1	IS 2	IS 3	Surr. 1	Surr. 2	Surr. 3
Cal Check Area	AV2226.D	237026	2196600	1088630			
AV2230.D	Soil blank 091500	266405	2248507	1044663	104	103	88
AV2234.D	00615	168713	1119498	352028 *	101	115	70
AV2237.D	00617	248779	2371485	1188906	107	99	96
Cal Check Area	AV2242.D	199989	1863930	914574			
AV2243.D	Soil bla	204163	1699375	779310	103	104	89
AV2245.D	00615	165142	1216495	387332 *	103	116	70
AV2246.D	00617 MS	195125	1921666	933290	107	100	97
AV2247.D	00617 MSD	198033	1930665	956748	108	98	99
<hr/>							
IS 1	Bromochloromethane						
IS 2	1,4-Difluorobenzene						
IS 3	Chlorobenzene-d5						
Surr. 1	1,2-Dichloroethane-d4	70-121					
Surr. 2	Toluene-d8	84-138					
Surr. 3	p-Bromofluorobenzene	59-113					

Table 2.4 Results of MS/MSD Analysis for VOC in Soil
WA # 0-141 Mills Gap Road

Sample ID: 00617

Compound Name	Sample Conc. µg/L	MS		MSD		MS		MSD		QC Limits	
		Spike Added µg/L	Spike Added µg/L	Conc. µg/L	Conc. µg/L	% Rec.	% Rec.	RPD	RPD	% Rec.	% Rec.
1,1-Dichloroethene	U	60.2	60.2	41	40	68	66	3	22	59 -	172
Benzene	U	60.2	60.2	60	60	99	100	1	21	66 -	142
Trichloroethene	35.4	60.2	60.2	62	60	43 *	41 *	6	24	62 -	137
Toluene	U	60.2	60.2	62	61	102	101	2	21	59 -	139
Chlorobenzene	U	60.2	60.2	60	59	99	98	1	21	60 -	133

QA/QC for BNA

Results of the Surrogate Percent Recoveries for BNA in Water

Before extraction, each sample was spiked with a six component mixture of CLP surrogate standards consisting of nitrobenzene-d₅, 2-fluorobiphenyl, terphenyl-d₁₄, phenol-d₅, 2-fluorophenol, and 2,4,6-tribromophenol. The surrogate percent recoveries for the water samples, listed in Table 2.5, ranged from 31 to 117. Forty-one out of forty-two values were within the acceptable QC limits.

Results of the Internal Standard Areas for BNA in Water

The internal standard areas (for 1,4-dichlorobenzene-d₄, naphthalene-d₈, acenaphthene-d₁₀, phenanthrene-d₁₀, chrysene-d₁₂, perylene-d₁₂) are listed in Table 2.6. All forty-two values areas were within the acceptable QC limits.

Results of the MS/MSD Analysis for BNA in Water

Sample A. B. D. E 00302 was chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses for the water samples. The percent recoveries, ranging from 33 to 110, are listed in Table 2.7. Eighteen out of twenty-two values were within the acceptable QC limits. The relative percent differences, also listed in Table 2.7, ranged from 1 to 11 and all eleven values were within the acceptable QC limits.

Results of the Surrogate Percent Recoveries for BNA in Soil

Before extraction, each sample was spiked with a six component mixture of CLP surrogate standards consisting of nitrobenzene-d₅, 2-fluorobiphenyl, terphenyl-d₁₄, phenol-d₅, 2-fluorophenol, and 2,4,6-tribromophenol. The surrogate percent recoveries for the soil samples, listed in Table 2.8, ranged from 38 to 107. All thirty values were within the acceptable QC limits.

Results of the Internal Standard Areas for BNA in Soil

The internal standard areas (for 1,4-dichlorobenzene-d₄, naphthalene-d₈, acenaphthene-d₁₀, phenanthrene-d₁₀, chrysene-d₁₂, perylene-d₁₂) are listed in Table 2.9. All thirty values areas were within the acceptable QC limits.

Results of the MS/MSD Analysis for BNA in Soil

Sample 617 was chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses for the soil samples. The percent recoveries, ranging from 53 to 79, are listed in Table 2.10. All twenty-two values were within the acceptable QC limits. The relative percent differences, also listed in Table 2.10, ranged from 0 (zero) to 7 and all eleven values were within the acceptable QC limits.

Table 2.5 Results of the Surrogate Percent Recoveries for BNA in Water
WA # 0-141 Mills Gap Road

Sample No.	File ID	Surr. 1	Surr. 2	Surr. 3	Surr. 4	Surr. 5	Surr. 6
WBLK082100	MIL003.D	54	36	79	66	68	72
A,B,C 00315	MIL004.D	47	32	73	67	71	70
A,B,E 00301	MIL005.D	52	37	81	64	90	73
A,B,D,E 00302	MIL006.D	51	35	74	61	78	65
A,B,D,E 00302MS	MIL007.D	54	38	84	65	89	72
A,B,D,E 00302MSD	MIL008.D	57	39	84	66	93	73
A,B,C 00309	MIL009.D	60	42	117	70	31	69

Surrogate Limits

Surr 1 =	2-Fluorophenol	21-110
Surr 2 =	Phenol-d5	10-110
Surr 3 =	Nitrobenzene-d5	35-114
Surr 4 =	2-Fluorobiphenyl	43-116
Surr 5 =	2,4,6-Tribromophenol	10-123
Surr 6 =	Terphenyl-d14	18-137

Table 2.6 Results of the Internal Standard Areas for BNA in Water
WA # 0-141 Mills Gap Road

Sample No.	File ID	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6
Cal Check Area	MIL002.D	66582	242884	124373	209313	220203	214335
WBLK082100	MIL003.D	63789	230461	121404	234255	239992	227988
A,B,C 00315	MIL004.D	68954	247276	132916	256779	272590	272665
A,B,E 00301	MIL005.D	62011	217997	140144	208228	254249	246662
A,B,D,E 00302	MIL006.D	66110	236149	148029	226757	272253	264857
A,B,D,E 00302MS	MIL007.D	66349	238950	153471	230208	276719	269708
A,B,D,E 00302MSD	MIL008.D	68719	247545	155956	233364	282041	275265
A,B,C 00309	MIL009.D	65634	204519	98951	166831	265619	265340

IS 1 = d4-Dichlorobenzene
IS 2 = d8-Naphthalene
IS 3 = d10-Acenaphthene
IS 4 = d10-Phenanthrene
IS 5 = d12-Chrysene
IS 6 = d12-Perylene

Table 2.7 Results of MS/MSD Analysis for BNA in Water
WA # 0-141 Mills-Gap Road

Sample ID: A,B,D,E 00302

Compound Name	Sample Conc. µg/L	MS	MSD	MS Conc. µg/L	MSD Conc. µg/L	MS % Rec.	MSD % Rec.	RPD	QC Limits	
		Spike Added µg/L	Spike Added µg/L						RPD	% Rec.
Phenol	U	108	100	38.9	37.3	36	37	4	42	12 - 110
2-Chlorophenol	U	108	100	75.7	70.7	70	71	1	40	27 - 123
1,4-Dichlorobenzene	U	53.8	50	30.6	31.8	57	64	11	28	36 - 97
N-Nitroso-Di-N-Propylamine	U	53.8	50	41.9	38.7	78	77	1	38	41 - 116
1,2,4-Trichlorobenzene	U	53.8	50	33.8	34.7	63	69	10	28	39 - 98
4-Chloro-3-Methylphenol	U	108	100	113	103	105	103	2	42	23 - 97
Acenaphthene	U	53.8	50	35.5	34.4	66	69	4	31	46 - 118
4-Nitrophenol	U	108	100	35.2	34.6	33	35	6	50	10 - 80
2,4-Dinitrotoluene	U	53.8	50	34.1	32.7	63	65	3	38	24 - 96
Pentachlorophenol	U	108	100	114	110	106	110	4	50	9 - 103
Pyrene	U	53.8	50	40.7	38.4	76	77	2	31	26 - 127

Table 2.8 Results of the Surrogate Percent Recoveries for BNA in Soil
WA # 0-0141 Mills Gap Road Site

Sample No.	File ID	Surr. 1	Surr. 2	Surr. 3	Surr. 4	Surr. 5	Surr. 6
SBLK091500	MIL012.D	75	82	85	84	76	88
615	MIL013.D	38	56	98	107	107	97
617	MIL014.D	53	60	65	73	75	87
617 MS	MIL015.D	56	66	69	77	80	88
617 MSD	MIL016.D	52	61	66	72	74	85

Surr 1 = 2-Fluorophenol 25-121
 Surr 2 = Phenol-d5 24-113
 Surr 3 = Nitrobenzene-d5 23-120
 Surr 4 = 2-Fluorobiphenyl 30-115
 Surr 5 = 2,4,6-Tribromophenol 19-122
 Surr 6 = Terphenyl-d14 18-137

Table 2.9 Results of the Internal Standard Areas for BNA in Soil
WA # 0-141 Mills Gap Road

Sample No.	File ID	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6
Cal Check Area	MIL011.D	72367	266425	137416	227158	231418	223008
SBLK091500	MIL012.D	64961	230230	123688	232112	232747	215863
615	MIL013.D	64783	221774	113161	220555	201579	196503
617	MIL014.D	63100	227171	121258	219171	223942	225116
617 MS	MIL015.D	59920	217180	114840	215636	219680	210030
617 MSD	MIL016.D	67306	245425	128868	244403	252735	241432

IS 1 = d4-Dichlorobenzene
IS 2 = d8-Naphthalene
IS 3 = d10-Acenaphthene
IS 4 = d10-Phenanthrene
IS 5 = d12-Chrysene
IS 6 = d12-Perylene

Table 2.10 Results of MS/MSD Analysis for BNA in Soil
WA # 0-141 Mills Gap Road
(Based on Dry Weight)

Sample ID: 617

Compound Name	Sample Conc. µg/kg	MS		MSD		MS % Rec.	MSD % Rec.	RPD	QC Limits	
		Spike Added µg/kg	Spike Added µg/kg	Conc. µg/kg	Conc. µg/kg				RPD	% Rec.
Phenol	U	3730	3730	2140	2030	57	54	5	35	26 - 90
2-Chlorophenol	U	3730	3730	2160	1990	58	53	8	50	25 - 102
1,4-Dichlorobenzene	U	1870	1870	1060	990	57	53	7	27	28 - 104
N-Nitroso-Di-N-Propylamine	U	1870	1870	1190	1130	64	60	5	38	41 - 126
1,2,4-Trichlorobenzene	U	1870	1870	1200	1140	64	61	5	23	38 - 107
4-Chloro-3-Methylphenol	U	3730	3730	2540	2360	68	63	7	33	26 - 103
Acenaphthene	U	1870	1870	1380	1310	74	70	5	19	31 - 137
4-Nitrophenol	U	3730	3730	2960	2950	79	79	0	50	11 - 114
2,4-Dinitrotoluene	U	1870	1870	1320	1260	71	67	5	47	28 - 89
Pentachlorophenol	U	3730	3730	2700	2700	72	72	0	47	17 - 109
Pyrene	U	1870	1870	1480	1460	79	78	1	36	35 - 142

QA/QC for Pesticides/PCBs

Results of the Surrogate Analysis for Pesticides/PCBs in Water

Each sample was spiked with a solution of tetrachloro-m-xylene and decachlorobiphenyl as surrogates. Percent recoveries ranged from 55 to 99 and are listed in Table 2.11. Eleven out of sixteen values were within the acceptable QC limits.

Results of the MS/MSD Analysis for Pesticides/PCBs in Water

Sample A, B, C 00309 was chosen for the matrix spike/matrix spike duplicate (BS/BSD) analyses. The percent recoveries were all 0 (zero) and are listed in Table 2.12. None of the twelve values were within the acceptable QC limits. The relative percent differences (RPDs), also listed in Table 2.12, were not calculated.

Table 2.11 Results of the Surrogate Recoveries
for Pesticide/PCBs in Water
WA # 0-141 Mills Gap Road

Sample ID	Percent Recovery	
	TCMX	DCBP
WBLK081800	99	87
A,B,C00315	87	97
A,B,E00301	76	63
A,B,D,E00302	85	71
A,B,C00309	0 *	58 *
A,B,C00309 MS	0 *	55 *
A,B,C00309 MSD	0 *	63

TCMX denotes Tetrachloro-m-xylene
DCBP denotes Decachlorobiphenyl

	Advisory QC Limits		
	TCMX	60 -	150
DCBP	60	-	150

Table 2.12 Results of the MS/MSD Analysis for Pesticide/PCB in Water
WA # 0-141 Mills Gap Road

Sample ID: A,B,C00309

Compound	Sample Conc µg/L	MS Spike Added µg/L	MS Conc µg/L	MS % Rec	MSD Spike Added µg/L	MSD Conc µg/L	MSD % Rec	RPD	Advisory QC Limits % Rec	RPD
g-BHC	U	0.194	U	0	* 0.194	U	0	* NC	56-123	15
Heptachlor	U	0.194	U	0	* 0.194	U	0	* NC	40-131	20
Aldrin	U	0.194	U	0	* 0.194	U	0	* NC	40-120	22
Dieldrin	U	0.388	U	0	* 0.388	U	0	* NC	52-126	18
Endrin	U	0.388	U	0	* 0.388	U	0	* NC	56-121	21
p,p'-DDT	U	0.388	U	0	* 0.388	U	0	* NC	38-127	27

QA/QC for Metals

Results of the QC Standard Analysis for Metals in Water

QC standards QC-7x100, QC-21x100, ERA-434, TMAA #1, TMAA #2 and SDWA-3028 were used to check the accuracy of the calibration curve. The percent recoveries, listed in Table 2.13, ranged from 94 to 110 and all nineteen recovered concentrations for which 95% confidence are available were within these limits. 95% Confidence limits are not available for seventeen values.

Results of the MS/MSD Analysis for Metals in Soil

Sample A 00305 was chosen for the matrix spike/matrix spike duplicate analysis (MS/MSD). The percent recoveries, listed in Table 2.14, ranged from 80 to 109. All thirty-eight values were within the acceptable QC limits. The relative percent differences, also listed in Table 2.14, ranged from 0 (zero) to 5. All nineteen values were within the acceptable QC limits.

Results of the Blank Spike Analysis for Metals in Soil

The results of the blank spike analysis are reported in Table 2.15. The percent recoveries ranged from 90 to 110 and all twenty-three values were within the acceptable QC limits.

Table 2.13 Results of the QC Standard Analysis for Metals in Water
WA # 0-141 Mills Gap Road

Metal	Date Analyzed	Quality Control Standard	Conc. Rec µg/L	Certified Value µg/L	95% Confidence Interval µg/L	% Rec
Aluminum	08/22/00 08/22/00	QC-7 x100 ERA-434	1011 705	1000 647	NA 531 - 763	101 109
Antimony	08/22/00	TMAA#2	95.2	100	81.7 - 125	95
Arsenic	08/25/00	TMAA #1	50.5	50	41.9-55.9	101
Barium	08/22/00 08/22/00	QC-7 x100 ERA-434	1011 749	1000 735	NA 603 - 867	101 102
Beryllium	08/22/00 08/22/00	QC-21 x100 ERA-434	1034 85	1000 82	NA 68 - 97	103 104
Cadmium	08/22/00 08/22/00	QC-21 x100 ERA-434	1036 79	1000 77	NA 63 - 90	104 103
Calcium	08/22/00	QC-21 x100	1042	1000	NA	104
Chromium	08/22/00 08/22/00	QC-21 x100 ERA-434	1061 112	1000 106	NA 87 - 125	106 106
Cobalt	08/22/00 08/22/00	QC-21 x100 ERA-434	1079 95	1000 88	NA 72 - 104	108 108
Copper	08/22/00 08/22/00	QC-21 x100 ERA-434	1033 152	1000 147	NA 121 - 173	103 103
Iron	08/22/00 08/22/00	QC-21 x100 ERA-434	1079 223	1000 206	NA 169 - 243	108 108
Lead	08/24/00	TMAA#1	49.24	50	43.4 - 56.3	98
Magnesium	08/22/00	QC-21 x100	989	1000	NA	99
Manganese	08/22/00 08/22/00	QC-21 x100 ERA-434	1055 242	1000 235	NA 193 - 277	106 103
Mercury	08/23/00	SDWA-3029	5.33	5.50	3.85 - 7.15	97
Nickel	08/22/00 08/22/00	QC-21 x100 ERA-434	1073 122	1000 112	NA 92 - 132	107 109
Potassium	08/22/00	QC-7 x100	9448	10000	NA	94
Selenium	08/23/00	TMAA #1	49.6	50	39.4-57.4	99
Silver	08/22/00 08/22/00	QC-7 x100 ERA-434	1031 91	1000 88	NA 72 - 104	103 103
Sodium	08/22/00	QC-7 x100	987	1000	NA	99
Thallium	08/24/00	TMAA #2	54.92	50	39.9-57.97	110
Vanadium	08/22/00 08/22/00	QC-21 x100 ERA-434	1023 118	1000 118	NA 97 - 139	102 100
Zinc	08/22/00 08/22/00	QC-21 x100 ERA-434	1044 280	1000 265	NA 217 - 313	104 106

Table 2.14 Results of the MS/MSD Analysis for Metals in Water
WA # 0-141 Mills Gap Road

Sample ID: A00305

Metal	Sample Conc µg/L	MS Spike Added µg/L	MS Conc µg/L	MS % Rec	MSD Spike Added µg/L	MSD Conc µg/L	MSD % Rec	RPD	Recommended QC Limits % Rec RPD	
Aluminum	109	2222	2198	94	2222	2219	95	1	75-125	20
Antimony	U	55.6	53.9	97	55.6	53.6	96	1	75-125	20
Arsenic	U	55.6	56.8	102	55.6	56.7	102	0	75-125	20
Barium	72.1	222	288	97	222	289	98	0	75-125	20
Beryllium	U	222	217	98	222	218	98	0	75-125	20
Cadmium	U	222	205	92	222	206	93	0	75-125	20
Chromium	U	222	218	98	222	218	98	0	75-125	20
Cobalt	23.1	222	244	99	222	242	99	1	75-125	20
Copper	U	222	222	100	222	222	100	0	75-125	20
Iron	111	2222	2309	99	2222	2322	99	1	75-125	20
Lead	U	55.6	58	104	55.6	57	103	2	75-125	20
Manganese	371	222	584	96	222	584	96	0	75-125	20
Mercury	U	2.00	1.6	80	2.00	1.68	84	5	75-125	20
Nickel	U	222	225	101	222	221	99	2	75-125	20
Selenium	U	55.6	53.9	97	55.6	53.9	97	0	75-125	20
Silver	U	222	196	88	222	199	90	2	75-125	20
Thallium	U	55.6	60.7	109	55.6	59.8	108	1	75-125	20
Vanadium	U	222	216	97	222	215	97	0	75-125	20
Zinc	22.3	222	232	94	222	232	94	0	75-125	20

Table 2.15 Results of the Blank Spike Analysis for Metals in Water
WA # 0-141 Mills Gap Road

Metal	Spiked Conc. µg/L	Rec Conc. µg/L	% Rec	Recommended QC Limits %Rec
Aluminum	2222	2139	96	75-125
Antimony	55.6	61.1	110	75-125
Arsenic	55.6	57.3	103	75-125
Barium	222	218	98	75-125
Beryllium	222	215	97	75-125
Cadmium	222	208	94	75-125
Calcium	2222	2121	95	75-125
Chromium	222	217	98	75-125
Cobalt	222	221	99	75-125
Copper	222	220	99	75-125
Iron	2222	2216	100	75-125
Lead	55.6	56.8	102	75-125
Magnesium	2222	2144	96	75-125
Manganese	222	216	97	75-125
Mercury	2.00	1.98	99	75-125
Nickel	222	220	99	75-125
Potassium	8889	8306	93	75-125
Selenium	55.6	56.1	101	75-125
Silver	222	200	90	75-125
Sodium	2222	2149	97	75-125
Thallium	55.6	59.5	107	75-125
Vanadium	222	215	97	75-125
Zinc	222	213	96	75-125

QA/QC for Cyanide and Total Petroleum Hydrocarbons

Results of the LCS/LCSD Analysis for Cyanide and Total Petroleum Hydrocarbons in Water

A sample was spiked and analyzed in duplicate for the laboratory control sample/laboratory control duplicate (LCS/LCSD) analyses. The percent recoveries, listed in Table 2.16, ranged from 100 to 106. Both values for the total petroleum hydrocarbons and cyanide were within the acceptable QC limits. The relative percent differences (RPDs), also listed in Table 2.16, were 1 and 6. The RPD for the total total petroleum hydrocarbons was within the acceptable QC limits. QC limits for the RPD for cyanide are not available.

Results of the MS/MSD Analysis for Cyanide in Water

Sample A 00316 was chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.17, were 100 and 110. Both values were within the acceptable QC limits. The relative percent differences (RPD), also listed in Table 2.17, was 10. QC limits for the RPD for this analysis are not available.

Results of the Surrogate Percent Recoveries for Total Petroleum Hydrocarbons in Water

Each sample was spiked with a solution of o-terphenyl as surrogate. The reported percent recoveries ranged from 98 to 101 and are listed in Table 2.18. All three reported values were within the acceptable QC limits. Two other values were from samples that had been diluted for analysis and the surrogate was not recovered.

Table 2.16 Results of the LCS/LCSD Analysis for Cyanide and Total Petroleum Hydrocarbons
in Water
WA # 0-141 Mills Gap Road

Analyte	LCS Spike Added µg/L	LCS Conc µg/L	LCS % Rec	LCSD Spike Added µg/L	LCSD Conc µg/L	LCSD % Rec	RPD	QC Limit RPD	% Rec
Cyanide	200	201	101	200	202	101	1	NA	80-120
Total Petroleum Hydrocarbons	500	500	100	500	530	106	6	30	73-137

Table 2.17 Results of the MS/MSD Analysis for Cyanide in Water
WA # 0-141 Mills Gap Road

Sample ID A00316

Analyte	Sample Conc µg/L	MS Spike Added µg/L	MS Conc µg/L	MS % Rec	MSD Spike Added µg/L	MSD Conc µg/L	MSD % Rec	RPD	Recommended QC Limits % Rec
Cyanide	U	100	100	100	100	110	110	10	75-125

Table 2.18 Results of the Surrogate Percent Recoveries for Total Petroleum Hydrocarbons in Water
WA # 0-141 Mills Gap Road

Sample ID	% Rec o-Terphenyl
Method Blank	101
A,B 00307	D
A,B 00308	D
LCS	98
LCSD	101
<hr/>	
	Advisory QC Limits
o-Terphenyl	64 - 110

Lockheed Martin Technology Services Group
Environmental Services REAC
2890 Woodbridge Avenue, Building 209 Annex Edison, NJ 08837-3679
Telephone 732-321-4200 Facsimile 732-494-4021

LOCKHEED MARTIN

Katahdin Analytical Services
340 County Road No5
PO Box 720
Westbrook, ME 04098

16 August 2000

Attn: Kelly Perkins

Project # RLA-00141 Mills Gap Road

As per Lockheed Martin / REAC Purchase Order GB84407J73, please analyze samples according to the following parameters:

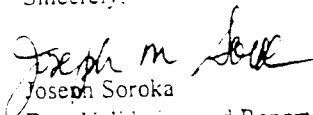
Analysis/Method	Matrix	# of samples
Oil Fingerprint/ SW-846-8015 Quantitative and Qualitative	Water	6-10
Data package: Package with Diskette Deliverable		

Samples are expected to arrive at your laboratory between August 17-18, 2000. **All applicable QA/QC(MS/MSD) analysis as per method, will be performed on our sample matrix. Preliminary sample and QC result tables plus a signed copy of our Chain of Custody must be faxed to REAC 10 business days after receipt of the samples.** The complete data package is due 21 business days after receipt of the last samples. The complete data package must include all items on the deliverables checklist. **Expect all samples to be difficult matrix and all raw data must be included in final analytical report.**

All sample and QC results (ie: MS/MSD, LCS, Duplicates, and Blanks) must be summarized in a ExCel diskette deliverable.

Please submit all reports and technical questions concerning this project to **John Johnson** at (732) 321-4248 or fax to (732) 494-4020. Any contractual question, please call Ray McCurdy at (732) 321-4296.

Sincerely,


Joseph M. Soroka

Data Validation and Report Writing Group Leader
Lockheed Martin / REAC Project

JS:jj Attachments

cc. R. Singhvi
G. Powell
0141 non mem 0008 sub 0141 Con

D. Miller
Subcontracting File
J. Ingram

R. McCurdy
K. Woodruff
J. Soroka

EPA Contract 68-C-99-223

CHAIN OF CUSTODY RECORD

Project Name: MILLS RAP ROAD SITE

Project Number: R1A00141

IM Contact: K. WOODRUFF Phone: 732-321-4200

No: 0031

Sheet 01 of 01 (Do not copy)

(for addnl. samples use new form)

081800-

Sample Identification

Analyses Requested

[illegible]

Matrix:

A- Air
AT-Animal Tissue
DL- Drum Liquids
DS- Drum Solids
GW- Groundwater
O- Oil
PR-Product
PT-Plant Tissue

PW- Potable Water
S- Soil
SD- Sediment
SL- Sludge
SW- Surface Water
TX-TCLP Extract
W- Water
X- Other

Special Instructions:

* C00302 not used.

* C00302 not used.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time
All / Analyzed	C. Chen	8/6/00	J. Z. [Signature]	8/7/00	1330
All / Analyzed	J. Z. [Signature]	8/1/00	C. Basser	8/18/00	15:00
2 / Fluoride	J. Z. [Signature]	082200	H. Bally	8/21/00	08:19

Items/Reason	Relinquished by	Date	Received by	Date	Time
2 / unclassified	J. Z. [Signature]	081900	[Signature]	8/18/00	3:00 PM
3 - VOA	J. Z. [Signature]	081900	J. Kewse	8.18.00.	3:00 PM

REAC, Edison NJ
(732) 321-4141
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: Milk separator
Project Number: 00141
IM Contact: H. Wondrup Phone: 132 321-4231

No: 01032
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

072900-

Sample Identification

Analyses Requested

REACH	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	VOC
202	Schmidt A,B,C	55 Concord Rd	GW	8/17/00	3	40 ml VOA/cool	X
203*	Linsbee A-I	32 Concord Rd	GW	↓	9	↓	X
204	Randall A,B,S	42 Concord Rd	GW	↓	3	↓	X

063

GW

GW

GW

Matrix:

A- Air
AT-Animal Tissue
DL- Drum Liquids
DS- Drum Solids
GW- Groundwater
O- Oil
PR-Product
PT-Plant Tissue

PW- Potable Water
S- Soil
SD- Sediment
SL- Sludge
SW- Surface Water
TX-TCLP Extract
W- Water
X- Other

Special Instructions:

Special Instructions:

* Use Linbee O Throat I as Oup, ms/ms O

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
all analysis	D. Woodruff	8/17/00	Myra J. [Signature]	05/24/00	09:30	all analysis	[Signature]	08/24/00	J. [Signature]	8.28.00	10:00

CHAIN OF CUSTODY RECORD

CHAIN OF CUSTODY RECORD
Project Name: Mills Tap Road Site
Project Number: R1400141
LM Contact: K. Woodruff Phone: 732-321-4200

No: 6-034
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

081800

Sample Identification

Analyses Requested

[illegible]

Matrix:

A- Air	PW- Potable Water
AT-Animal Tissue	S- Soil
DL- Drum Liquids	SD- Sediment
DS- Drum Solids	SL- Sludge
GW- Groundwater	SW- Surface Water
O- Oil	TX-TCLP Extract
PR-Product	W- Water
PT-Plant Tissue	X- Other

Special Instructions:

* C00301 } not used
D00301 }

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #:
A 00316 Sub control to
Katalin, west bank ME
Coc # 01041

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
All Analyses	C. Chu	8/17/00	J. J. J.	8/18/00	13:30	1fr TAL	J. J. J.	8/18/00	C. Chu	8/18/00	13:45
2 / 1st, 2nd, 3rd	Y. J. J.	8/17/00	Oliver J. J.	8/18/00	2:00	1 - VPA	Y. J. J.	8/18/00	J. J. J.	8.18.00	13:50
1/crude	J. J. J.	082000									

WG 2471

Project Name: Mills Gray J. Site
Project Number: RIA0041
IM Contact: K. WOODRUFF Phone: 732-321-4200

No: **01.035**
Sheet **01** of **01** (Do not copy)
(for addnl. samples use new form)

Sample Identification

Analyses Requested

[illegible]

Matrix:

Special Instructions:

A- Air	PW- Potable Water
AT-Animal Tissue	S- Soil
DL- Drum Liquids	SD- Sediment
DS- Drum Solids	SL- Sludge
GW- Groundwater	SW- Surface Water
O- Oil	TX- TCLP Extract
PR-Product	W- Water
PT-Plant Tissue	X- Other

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #:

[illegible]

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD
Project Name: Mills, P. Road
Project Number: RIA 00191
LM Contact: L. Woodroff Phone: 732 821 9200

WQ 2492

No: 01041
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

Sample Identification

Analyses Requested

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Lyophilized				
029	A-00316	Sump	W	8/17/00	1	1L poly/NaOH	X				
990											

Matrix:

Special Instructions:

A- Air
AT- Animal Tissue
DL- Drum Liquids
DS- Drum Solids
GW- Groundwater
O- Oil
PR- Product
PT- Plant Tissue
PW- Potable Water
S- Soil
SD- Sediment
SL- Sludge
SW- Surface Water
TX- TCLP Extract
W- Water
X- Other

**SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #:**

01034

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
1/1/00	[Signature]	08/21/00	[Signature]	08/21/00	0800						

Analyses Requested

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #:

☆ U.S. GPO: 2000-521-151