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Wilmington, NC 28404-0279
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January 4, 2007

NAVFAC Mid-Atlantic
Marine Corps North Carolina IPT
Environmental Business Line
Code: OPCEV4DC
Attn: Mr. David T. Cleland, P.G.
6506 Hampton Boulevard
Building C, Room 314
Norfolk, VA 23508-1278

Re: **Site BB-9**
Groundwater Sampling
Marine Corps Base
Camp Lejeune, North Carolina
Navy Contract No. N62470-05-D-6200
Delivery Order No. 0016
CATLIN Project No. 205-077

Dear Mr. Cleland:

In September of 2006 a Report of Findings concerning this site was submitted to the Wilmington Regional Office (WiRO) of the North Carolina Department of Environment and Natural Resource (NCDENR) detailing recent soil sampling results and requesting the site be considered for No Further Action. In an e-mail dated November 1, 2006, Mr. Bruce Reed of the WiRO requested that a groundwater sample be collected from monitoring well BB9-3 in order to justify the No Further Action request. This letter presents the results of the groundwater sampling event at this site.

CATLIN mobilized to the site on November 20, 2006 to sample monitoring well BB9-3. Upon investigating the site, it was determined that monitoring well BB9-3 no longer existed. In response, CATLIN mobilized a direct push technology rig to the site on December 8, 2006, installed a boring, set a temporary monitoring well, obtained a groundwater sample and abandoned the temporary well (the Well Construction Record Well Log and Well Abandonment Record is attached). The temporary well (BB9 TW01) was set as close as possible to the location of previous well BB9-3 (see attached Figure 1). The groundwater sample was placed in appropriate glassware and transported under proper chain-of-custody to SGS Environmental Services, Inc. of Wilmington, North Carolina for analysis by EPA Method 625 and MADEP VPH and EPH.

Results of the laboratory analysis are summarized in Tables 1-3 and as follows:

EPA 625

Benzo[k]fluoranthene, Chrysene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, Fluoranthene, Phenanthrene, and Pyrene were all detected at low concentrations with Benzo[k]fluoranthene (1.30 ug/L) and 1,4-Dichlorobenzene (4.20 ug/L) exceeding their NCAC 2L Groundwater Quality Standards (2L GWQS) of 0.479 ug/L and 1.4 ug/L, respectively. Benzo[k]fluoranthene and Chrysene (1.5 ug/L) concentrations were in excess of their respective Gross Contaminant Levels of 0.47 ug/L and 0.8 ug/L. See attached laboratory summary Table 1.

MADEP VPH/EPH

MADEP VPH and EPH fractions were detected in the groundwater sample. Only the C9-C22 Aromatic concentration of <340 ug/L was in excess of the 2L GWQS of 210 ug/L. There are no established GCLs for the MADEP fractions. See attached laboratory summary Tables 2 and 3.

Refer to the attached laboratory report for analytical results and chain of custody documentation.

Based on a review of the laboratory results, there are contaminant concentrations in excess of the 2L GWQS and GCLs that prevent the site from being considered for No Further Action at this time. It is recommended that the groundwater at the site be allowed to naturally attenuate and the site be re-sampled in two years to determine if the contaminant concentrations have been reduced to below acceptable levels.

CATLIN Engineers and Scientists appreciate the opportunity to continue to provide services to NAVFAC Mid-Atlantic and the MCB on your environmental projects.

Sincerely,



Michael E. Mason, P.E.
Program Manager



Attachments

cc: Ms. Elloise M. Hitsheiw, NAVFAC Contracting Officer, correspondence only
Commanding Officer, Attn: Director I&E/EMD/EQB (2 copies)

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality

WELL CONTRACTOR (INDIVIDUAL) NAME (print) William J. Miller CERTIFICATION # 2927
WELL CONTRACTOR COMPANY NAME CATLIN Engineers & Scientists PHONE # (910) 452-5861
STATE WELL CONSTRUCTION PERMIT # 2927 ASSOCIATED WO PERMIT # N/A
(if applicable) (if applicable)

BB9-TW01

1. WELL USE (Check Applicable Box): Residential Municipal/Public Industrial Agricultural
Monitoring Recovery Heat Pump Water Injection Other If Other, List Use _____

2. WELL LOCATION:

Nearest Town: Camp Lejeune County: Onslow

(Road Name and Numbers, Community, Subdivision, Lot No., Zip Code)

3. OWNER: MCB, Camp Lejeune, Commanding Officer

Address: Attn: I&E/ EMD/ EQB/ PSC Box 20004
(Street or Route No.)

Camp Lejeune NC 28542-0004
City or Town State Zip Code

451-9017

Area code - Phone number

Topographic/Land Setting
 Ridge Slope Valley Flat
(check appropriate box)

Latitude/Longitude of well location

(degrees*/minutes*/seconds")

Latitude/longitude source: GPS Topo. map
(check box)

DEPTH
From To

DRILLING LOG
Formation Description

4. DATE DRILLED: 12/8/2006

5. TOTAL DEPTH: 8.5

6. DOES WELL REPLACE EXISTING WELL? YES NO

7. STATIC WATER LEVEL Below Top of Casing 7.8 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS 0 FT. Above Land Surface*

* Top of casing terminated at/or below land surface requires
a variance in accordance with 15A NCAC 2C.0118

SEE
ATTACHED

9. YIELD (gpm): N/A METHOD OF TEST N/A

10. WATER ZONES (depth): Surficial Aquifer

12. DISINFECTION: Type N/A Amount N/A

13. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>0</u> To <u>3</u> ft.	<u>2</u> in.	<u>Sch. 40</u>	<u>PVC</u>
From _____ To _____ ft.	_____ in.	_____	_____
From _____ To _____ ft.	_____ in.	_____	_____

14. GROUT:

Depth	Material	Method
From _____ To _____ ft.	_____	_____
From _____ To _____ ft.	_____	_____

15. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>3</u> To <u>8.5</u> ft.	<u>2</u> in.	<u>Slot .010</u> in.	<u>PVC</u>
From _____ To _____ ft.	_____ in.	_____ in.	_____

16. SAND/GRAVEL PACK:

Depth	Size	Material
From _____ To _____ ft.	_____	_____
From <u>0</u> To <u>8.5</u> ft.	_____	<u>Natural Backfill</u>

SEE
ATTACHED

17. REMARKS: Abandoned well on 12/8/06 with bentonite from 0.5 to 10' bls.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.



SIGNATURE OF PERSON CONSTRUCTING THE WELL

12-8-2006

DATE

Submit original to Division of Water Quality, Attn: Information Management, 1617 Mail Service Center - Raleigh, NC 27699-1617 Phone No. (919) 733-7015, within 30 days.

Modified from:
GW-1 REV.09/2004

WELL LOG

CATLIN

ENGINEERS and SCIENTISTS
205-077
Wilmington, NC

SHEET 1 OF 1

PROJECT NO.: 205-077	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: BB-9	LOGGED BY: Justin Heter	WELL ID: BB9-TW01	
	DRILLER: William J. Miller		
NORTHING:	EASTING:	CREW: Anthony Chance	
SYSTEM: N/A	BORING LOCATION: See Map		T.O.C. ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: 7.8	TOTAL DEPTH: 10.0
START DATE: 12/8/06	FINISH DATE: 12/8/06	24 HOUR DTW: NM	WELL DEPTH: 8.5

DEPTH	BLOW COUNT				OVA (ppm)	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	WELL DETAIL
	6in	6in	6in	6in						
0.0								0.0	LAND SURFACE	0.0
2.0	D	P	D	P			SP	2.0	Dark to med. brown, fine SAND with some organic debris in top layer. Moist. No Odor.	2" Sch. 40 PVC
4.0	D	P	D	P			SW	4.0	S.A.A grading into black fine SAND with conglomerates and brown, fine SAND interlayered. Sat.	2" Sch. 40 PVC
6.0	D	P	D	P				6.0		
8.0	D	P	D	P			SP	8.0	Black, very fine SAND and very compact. Sat. Slight HCO. Hit refusal at 10' bls.	2" Sch. 40 PVC
10.0								10.0	Boring Terminated at Depth 10.0 ft Abandoned well on 12/8/06 with bentonite from 0.5 to 10' bls.	

 Native Backfill

CATLIN BORING LOG 205-077_BB-9.GPJ TEST.GDT 11/4/07



WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources - Division of Water Quality

WELL CONTRACTOR CERTIFICATION #: 2927

1. WELL CONTRACTOR:

Well Contractor (Individual) Name

CATLIN Engineers and Scientists

Well Contractor Company Name

STREET ADDRESS 220 Old Dairy Road

Wilmington North Carolina 28405

City or Town State Zip Code

(910) - 452-5861

Area code - Phone number

2. WELL INFORMATION

SITE WELL ID # (if applicable):

STATE WELL PERMIT # (if applicable): 2927

DWQ or OTHER PERMIT # (if applicable):

WELL USE (Check Applicable Box): Monitoring Residential

Municipal/Public Industrial/Commercial Agricultural

Recovery Injection Irrigation

Other (list use):

3. WELL LOCATION:

COUNTY: Onslow QUADRANGLE NAME:

NEAREST TOWN: Camp Lejeune

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING

Slope Valley Flat Ridge Other: _____

LATITUDE: _____

LONGITUDE: _____

May be in degrees, minutes seconds, or in a decimal

Latitude/longitude source: GPS Topo. map

(Location of well must be shown on a USGS topo map and attached to this form if not using a GPS.)

4a. FACILITY - is the name of the business where the well is located. Complete 4a and 4b

(If a residential well, omit 4a and complete 4b, well owner information only)

FACILITY ID # (if applicable)

NAME OF FACILITY:

STREET ADDRESS:

Camp Lejeune, NC

City or Town State Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME: MCB, Camp Lejeune, Commanding Officer

STREET ADDRESS: Attn: I&E/ EMD/ EQB/ PSC Box 20004

Camp Lejeune NC 28542-0004

City or Town State Zip Code

(910) - 451-9017

Area code - Phone number

5. WELL DETAILS:

a. Total Depth: 8.5 Ft. Diameter: 2 In.

b. Water Level (Below Measuring Point): _____ In.

Measuring point is 0 ft. above land surface

6. CASING:

Length

Diameter

a. Casing Depth (if known): 2 ft. 2 in.

b. Casing Removed: _____ ft. 2 in.

7. DISINFECTION: N/A

(Amount of 70% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement

Bags of cement _____

Gallons of water _____

Sand Cement

Bags of cement _____

Gallons of water _____

Bentonite

Bags of bentonite 1

Type: Slurry Pellets

Gallons of water _____

Other

Type material _____

Amount _____

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Surface Pour

10. WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depth and types of fill material used.

11. DATE WELL ABANDONED

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF PERSON ABANDONING THE WELL

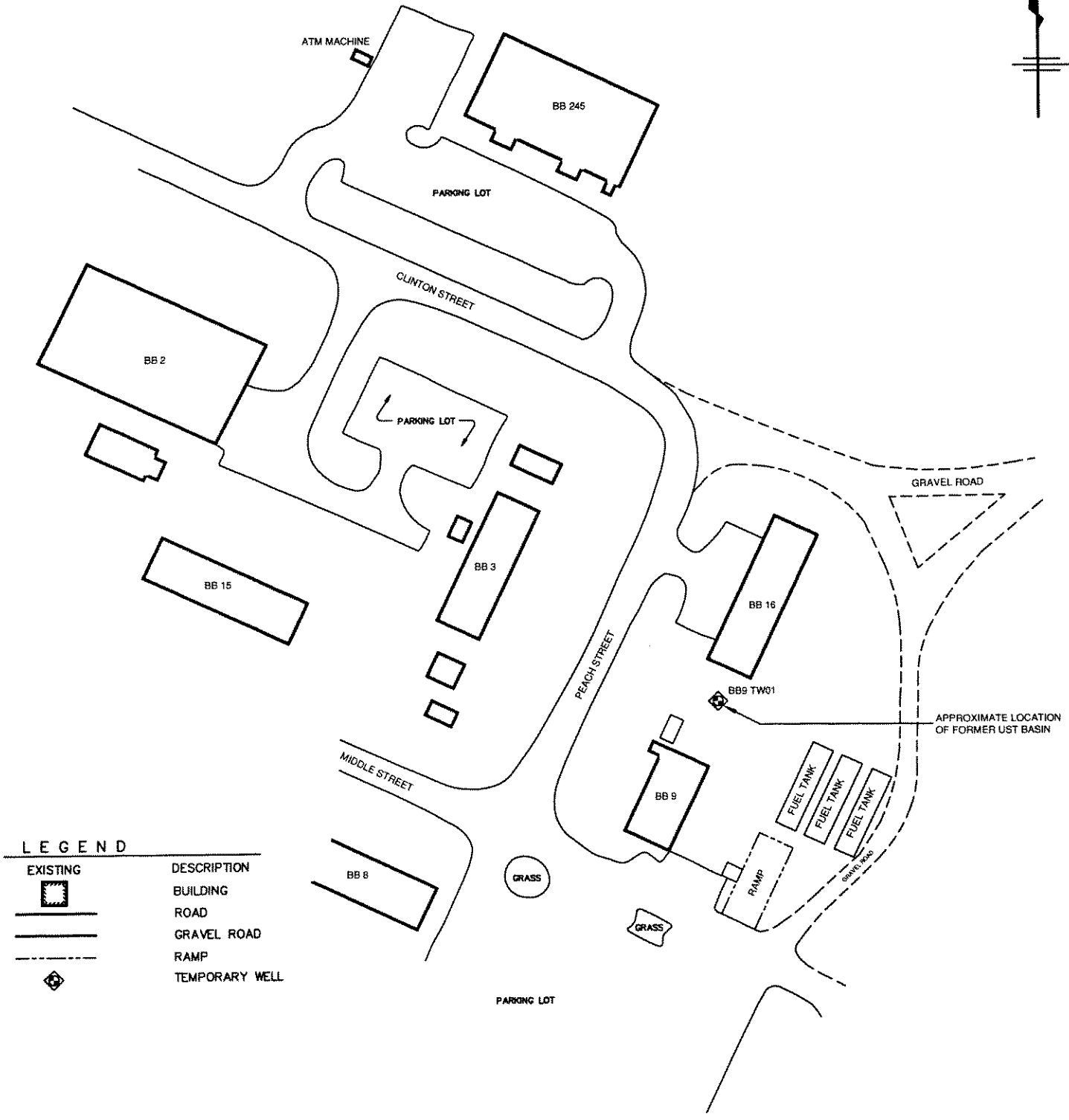
DATE

(Well abandonment must be performed by a Certified Well Contractor unless the private well owner personally abandons the well in accordance with 15A NCAC 2C .0113).

William J Miller

12-8-06

PRINTED NAME OF PERSON ABANDONING THE WELL



LEGEND

EXISTING	DESCRIPTION
	BUILDING
	ROAD
	GRAVEL ROAD
	RAMP
	TEMPORARY WELL

NOTE:
 1). FIGURE MODIFIED FROM BAKER ENVIRONMENTAL INC. SITE PLAN
 2). TEMPORARY GROUNDWATER MONITORING WELL LOCATION IS APPROXIMATE.



 WILMINGTON, NORTH CAROLINA	PROJECT BB-9 GROUNDWATER SAMPLING MARINE CORP. BASE CAMP LEJEUNE, NC	TITLE BB-9 SITE PLAN WITH TEMPORARY WELL LOCATION	FIGURE 1
	JOB NO: 205-077 DATE: DEC 2006	SCALE: 1" = 100'	DRAWN BY: KAWS CHECKED BY: MEM

TABLE 1 SUMMARY OF GROUNDWATER LABORATORY RESULTS

Date: December 2006

Incident Number and Name: BB-9

Analytical Method: EPA Method 625

Well ID	Contaminant of Concern		EPA Method 625 Compounds							
	Sample ID	Date Collected	Benzo[k]fluoranthene	Chrysene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	Fluoranthene	Phenanthrene	Pyrene	Remaining 625 Compounds
GCL 2L GWQS			0.47 0.479	0.8 4.79	24,000 24	39,500 1.4	280 280	410 210	210 210	Varies Varies
BB-9 TW01	BB-9 TW01	12/8/2006	1.30 J	1.50 J	4.40 J	4.20 J	1.70 J	1.80 J	2.90 J	BQL

BQL = Below Quantitation Limit

All results in micrograms per Liter - ug/L

NE - Not Established

Bold figure indicates concentration exceeds applicable 2L GWQS.

J - Estimated concentration, below calibration range and above Method Detection Limit.

TABLE 2 SUMMARY OF GROUNDWATER LABORATORY RESULTS

Date: December 2006

Incident Number and Name: BB-9

Analytical Method: MADEP Method VPH/EPH

Well ID	Hydrocarbon Fraction		VPH			EPH		
			C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics
Sample ID	Date Collected							
BB-9 TW01	BB-9 TW01	12/8/2006	<100	<100	<100	420	1,500	240

Concentrations are in micrograms per Liter - ug/L

TABLE 3 SUMMARY OF GROUNDWATER LABORATORY RESULTS

Date: December 2006

Incident Number and Name: BB-9

Analytical Method: MADEP Method VPH/EPH as compared to NCDENR 2L GWQS

Well ID	Hydrocarbon Fraction of Concern →		C5-C8 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C22 Aromatics
	Sample ID	Date Collected				
GCL 2L GWQS			NE 420	NE 4,200	NE 42,000	NE 210
BB-9 TW01	BB-9 TW01	12/8/2006	<100	<520	1,500	<340

Concentrations are in micrograms per Liter - ug/L.

NE - Not Established

Bold figure indicates concentration exceeds applicable 2L GWQS.



Mr. Mike E. Mason
Richard Catlin & Associates
P.O. Box 10279
Wilmington NC 28404-0279

Report Number: G128-1872
Client Project: 205-077 (BB-9)


Dear Mr. Mason:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call SGS/Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS/Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
SGS/Paradigm Analytical Laboratories, Inc.


Laboratory Director
J. Patrick Weaver

12/21/2006
Date



**Results for Semivolatiles
by GCMS 625**

Client Sample ID: BB-9 TW01
Client Project ID: 205-077 (BB-9)
Lab Sample ID: G128-1872-1E
Lab Project ID: G128-1872

Analyzed By: EAW
Date Collected: 12/8/2006 12:00
Date Received: 12/11/2006
Date Extracted: 12/12/2006
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/13/2006	
Acenaphthylene	BQL	10.0	1.12	1	12/13/2006	
Anthracene	BQL	10.0	1.75	1	12/13/2006	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/13/2006	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/13/2006	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/13/2006	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/13/2006	
Benzo[k]fluoranthene	1.30	10.0	1.09	1	12/13/2006	J
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/13/2006	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/13/2006	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/13/2006	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/13/2006	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/13/2006	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/13/2006	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/13/2006	
2-Chlorophenol	BQL	10.0	4.22	1	12/13/2006	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/13/2006	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/13/2006	
Chrysene	1.50	10.0	1.11	1	12/13/2006	J
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/13/2006	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/13/2006	
1,2-Dichlorobenzene	4.40	10.0	1.25	1	12/13/2006	J
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/13/2006	
1,4-Dichlorobenzene	4.20	10.0	1.20	1	12/13/2006	J
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/13/2006	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/13/2006	
Diethylphthalate	BQL	10.0	1.48	1	12/13/2006	
Dimethylphthalate	BQL	10.0	1.04	1	12/13/2006	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/13/2006	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/13/2006	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/13/2006	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/13/2006	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/13/2006	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/13/2006	
Diphenylamine *	BQL	10.0	1.53	1	12/13/2006	
Fluoranthene	1.70	10.0	1.41	1	12/13/2006	J
Fluorene	BQL	10.0	1.22	1	12/13/2006	
Hexachlorobenzene	BQL	10.0	1.22	1	12/13/2006	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/13/2006	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/13/2006	
Hexachloroethane	BQL	10.0	1.58	1	12/13/2006	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/13/2006	
Isophorone	BQL	10.0	1.27	1	12/13/2006	
Naphthalene	BQL	10.0	1.08	1	12/13/2006	
Nitrobenzene	BQL	10.0	1.32	1	12/13/2006	
2-Nitrophenol	BQL	10.0	3.52	1	12/13/2006	
4-Nitrophenol	BQL	50.0	3.17	1	12/13/2006	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/13/2006	
Pentachlorophenol	BQL	50.0	2.83	1	12/13/2006	
Phenanthrene	1.80	10.0	1.38	1	12/13/2006	J



**Results for Semivolatiles
by GCMS 625**

Client Sample ID: BB-9 TW01
 Client Project ID: 205-077 (BB-9)
 Lab Sample ID: G128-1872-1E
 Lab Project ID: G128-1872

Analyzed By: EAW
 Date Collected: 12/8/2006 12:00
 Date Received: 12/11/2006
 Date Extracted: 12/12/2006
 Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Phenol	BQL	10.0	3.38	1	12/13/2006	
Pyrene	2.90	10.0	2.08	1	12/13/2006	J
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/13/2006	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/13/2006	
		Spike Added	Spike Result	Percent Recovered		
2-Fluorobiphenyl		10	6.6	66		
2-Fluorophenol		10	8.7	87		
Nitrobenzene-d5		10	8.9	89		
Phenol-d6		10	9	90		
2,4,6-Tribromophenol		10	8.8	88		
4-Terphenyl-d14		10	5.4	54		

Comments:

* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:

BQL = Below Quantitation Limits.
 J = Detected below the quantitation limit.

Reviewed By:



VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: 205-077 (BB-9)

Sample Information and Analytical Results	
Sample Identification	BB-9 TW01
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/08/06
Date Received	12/11/06
Date Extracted	12/11/06
Date Analyzed	12/11/06
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: g128-1872-1b

Reviewed By: ful



Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 11/21/06 PID Initial Calibration Date: 11/21/06

Calibration Ranges and Limits

Range	MDL (07/15/2004) (µg/L)	ML (µg/L)	RL	
			(µg/L)	(mg/Kg)
C ₅ -C ₈ Aliphatics	4.4	14	100	10
C ₉ -C ₁₂ Aliphatics	3.4	11	100	10
C ₉ -C ₁₀ Aromatics	0.13	0.41	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	%RSD or CCC	Method of Quantitation
C ₅ -C ₈ Aliphatics	40	21.8	Calibration Factor
	1000		
	2000		
	3000		
	4000		
C ₉ -C ₁₂ Aliphatics	10	24.00	Calibration Factor
	250		
	500		
	750		
	1000		
C ₉ -C ₁₀ Aromatics	10	0.99	Linear Regression
	250		
	500		
	750		
	1000		

Calibration Check Date: 12/11/06

Calibration Check

Range	Levels (µg/L)		RPD
	(mg/Kg)		
C ₅ -C ₈ Aliphatics	2000	200	17.6
C ₉ -C ₁₂ Aliphatics	500	50	1.1
C ₉ -C ₁₀ Aromatics	500	50	-12.1

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit

RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve



EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: 205-077 (BB-9)

Sample Information and Analytical Results	
Sample Identification	BB-9 TW01
Sample Matrix	Water
Date Collected	12/08/06
Date Received	12/11/06
Date Extracted	12/14/06
Date Analyzed	12/18/06
Dry Weight	
Dilution Factor	1:1
C ₉ -C ₁₈ Aliphatics*	420 (ug/L)
C ₁₉ -C ₃₆ Aliphatics*	1500 (ug/L)
C ₁₁ -C ₂₂ Aromatics*	240 (ug/L)
Aliphatic Surrogate % Recovery	46
Aromatic Surrogate % Recovery	40
Fractionation Surrogate 1 % Recovery	85

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G128-1872-1F

Reviewed By: RM



Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information
--

Initial Calibration Date: 12/11/06**Calibration Ranges and Limits**

Range	MDL (2/2004) (µg/L)	ML (µg/L)	RL	
			(µg/L)	(mg/Kg)
C ₉ -C ₁₈ Aliphatics	3.84	12.2	100	10
C ₁₉ -C ₃₆ Aliphatics	0.57	1.8	100	10
C ₁₁ -C ₂₂ Aromatics	4.54	14.4	100	10

Calibration Concentration Levels

Range	Levels (µg/mL)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	6	1.00	Linear Regression
	30		
	60		
	120		
	240		
C ₁₉ -C ₃₆ Aliphatics	8	1.0	Linear Regression
	40		
	80		
	160		
	320		
C ₁₁ -C ₂₂ Aromatics	17	1	Linear Regression
	85		
	170		
	340		
	680		

Calibration Check Date: 12/18/06**Calibration Check**

Range	Levels (µg/mL)	RPD
C ₉ -C ₁₈ Aliphatics	120	-17.5
C ₁₉ -C ₃₆ Aliphatics	160	-15.8
C ₁₁ -C ₂₂ Aromatics	340	-0.2

MDL = Method Detection Limit
 ML = Minimum Limit
 RL = Reportable Limit

RPD = Relative Percent Difference
 %RSD = Percent Relative Standard Deviation
 CCC = Correlation Coefficient of Curve



List of Reporting Abbreviations and Data Qualifiers

- B = Compound also detected in batch blank
- BQL = Below Quantitation Limit (RL or MDL)
- DF = Dilution Factor
- Dup = Duplicate
- D = Detected, but RPD is > 40% between results in dual column method.
- E = Estimated concentration, exceeds calibration range.
- J = Estimated concentration, below calibration range and above MDL
- LCS(D) = Laboratory Control Spike (Duplicate)
- MDL = Method Detection Limit
- MS(D) = Matrix Spike (Duplicate)
- PQL = Practical Quantitation Limit
- RL = Reporting Limit
- RPD = Relative Percent Difference
- mg/kg = milligram per kilogram, ppm, parts per million
- ug/kg = micrograms per kilogram, ppb, parts per billion
- mg/L = milligram per liter, ppm, parts per million
- ug/L = micrograms per liter, ppb, parts per billion
- % Rec = Percent Recovery
- % solids = Percent Solids

Special Notes:

- 1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.
- 2) Uncertainty for all reported data is less than or equal to 30 percent.

