1560060

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III
OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE
201 DEFENSE HIGHWAY
SUITE 200
ANNAPOLIS, MARYLAND 21401

DATE : December 5, 1995

SUBJECT: Region III Data QA Review

FROM : Cynthia E. Caporale
Region III ESAT RPO (3EP20)

TO : Lisa Marino
Regional Project Manager (3HW42)

Attached are the organic, inorganic, and dioxin data validation reports for the Koppers County Facility Site (Non-CLP) (Projects 92129 and 951460) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

If you have any questions regarding this review, please call me at (410) 573-2732.

Attachments

cc: TID File: 03951115
03951117

AR310302

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Lockheed

Environmental Services Assistance Teams
Region 3
1419 Forest Drive, Suite 104
Annapolis, Maryland 21403

Phone: (410) 268-7705
Fax: (410) 268-8472

DATE: December 01, 1995

SUBJECT: Organic Data Validation for Case 92129
Site: Koppers Co. Fac. Plant

FROM: Douglas S. Buffington DB
Organic Data Reviewer

Mahboobeh Mecanic MM
Senior Oversight Chemist

TO: Cynthia E. Caporale
ESAT Regional Project Officer

THROUGH: Dale S. Boshart DSB
ESAT Team Manager

OVERVIEW

Case 92129 consisted of three (3) aqueous samples submitted to Aquatec, Inc. (AQUAI) for volatile and semivolatile analyses. The analyses were performed according to the 10/92 Superfund Analytical Method for Low Concentration Organics. The case included one (1) trip blank, which was analyzed for volatiles only. The samples were analyzed as a Non-Contract Laboratory Program (non-CLP).

SUMMARY

All samples were successfully analyzed for all target compounds. All instrument and method sensitivities were according to the specified method.

NOTES

- Although not specified on the Chain of Custody, sample 32721 was treated as a trip blank during data validation, due to the station location code and the fact that this sample was analyzed for volatile compounds only.

- In the semivolatile analysis, sample 32723 was incorrectly reported as sample 32733 on the Form Is. The incorrect sample numbers were crossed off the Form Is, and the correct numbers were entered on the Form Is during data validation.

- The compounds 2,4-dinitrophenol and di-n-octylphthalate failed precision criteria in the semivolatile continuing calibration (%D >50%). No data were affected.

- The maximum concentration of all compounds found in the analyses of the trip and laboratory method blanks are listed below. Samples with concentrations of common laboratory contaminants less than ten times (<10X) the blank concentration, or with concentrations of other contaminants less than five times (<5X) the blank concentration, have been qualified "B" on the data summary forms.

Compound	Concentration (µg/L)
acetone *	3 J
toluene	0.3 J
xylenes *(total)*	0.2 J
bis(2-ethylhexyl)phthalate *	3 J

* Common Laboratory Contaminant

- In the semivolatile LCS analysis, three (3) of fifteen (15) spike recoveries were outside the QC limits.

- In the semivolatile analysis of laboratory method blank SBLKU2, the base/neutral surrogate 2-fluorobiphenyl exceeded the upper QC limit. No data were qualified.

- In the semivolatile analysis of laboratory control sample SLCSA1, the surrogates 2-fluorobiphenyl and 2-fluorophenol exceeded the upper QC limits. No data were qualified.

- The tentatively identified compounds (TICs) in Appendix D were reviewed and corrected during data validation. Compounds identified as blank contaminants were crossed off the TIC Form Is.

All data for Case 92129 were reviewed according to the National Functional Guidelines for Evaluating Organic Analyses with modification for use within Region III. The text of the report addresses only those problems affecting usability.

ATTACHMENTS

1) Appendix A - Glossary of Data Qualifiers
2) Appendix B - Data Summary. These include:
   (a) All positive results for target compounds with qualifier codes where applicable.
   (b) All unusable detection limits (qualified "R").
3) Appendix C - Results as Reported by the Laboratory for All Target Compounds
4) Appendix D - Reviewed and Corrected Tentatively Identified Compounds
5) Appendix E - Support Documentation

DCN:DB511A04.KOP

Appendix A

Glossary of Data Qualifiers

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

CODES RELATED TO IDENTIFICATION
(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NO CODE = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: O L A T I L E S 1

Site Name: KOPPERS CO. FAC. PLANT

WATER SAMPLES
(ug/L)

Case #: 92129 Sampling Date(s): 09/18/95

To calculate sample quantitation limits:
(CRDL * Dilution Factor)

	Sample No.	32721		32722		32723					
	Dilution Factor	1.0		1.0		1.0					
	Location	95-KNDRW8-TB		95-KNDRW8-QA		95-KNDRW22-QA					
		SAMPLE IS A TRIP BLANK.									
CRQL	COMPOUND										
1	Chloromethane					0.5	J				
1	Bromomethane										
1	*Vinyl Chloride										
1	Chloroethane										
2	*Methylene Chloride	0.4	J								
5	Acetone	3	B								
1	Carbon Disulfide										
1	*1,1-Dichloroethene										
1	1,1-Dichloroethane										
1	cis-1,2-Dichloroethene										
1	trans-1,2-Dichloroethene										
1	Chloroform										
1	1,2-Dichloroethane										
5	2-Butanone										
1	Bromochloromethane										
1	1,1,1-Trichloroethane										
1	Carbon Tetrachloride										
1	Bromodichloromethane										

1 = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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Site Name: KOPPERS CO. FAC. PLANT

WATER SAMPLES
(ug/L)

Case #: 92129 Sampling Date(s): 09/18/95

To calculate sample quantitation limits:
(CRQL * Dilution Factor)

	Sample No.	32721		32722		32723									
	Dilution Factor	1.0		1.0		1.0									
	Location	95-KNDRW8-TB		95-KNDRW8-QA		95-KNDRW22-QA									
		SAMPLE IS A TRIP BLANK.													
CRQL	COMPOUND														
1	*1,2-Dichloropropane														
1	Cis-1,3-Dichloropropene														
1	Trichloroethene														
1	Dibromochloromethane														
1	1,1,2-Trichloroethane														
1	*Benzene														
1	Trans-1,3-Dichloropropene														
1	Bromoform			0.5	J										
1	1,2-Dibromoethane														
5	4-Methyl-2-pentanone														
5	2-Hexanone														
1	*Tetrachloroethene			0.4	J	0.3	J								
1	1,1,2,2-Tetrachloroethane														
1	*Toluene														
1	*Chlorobenzene														
1	*Ethylbenzene														
1	*Styrene														
1	*Total Xylenes														
1	1,2-Dibromo-3-Chloropropane														
1	1,3-Dichlorobenzene														
1	1,4-Dichlorobenzene														
1	1,2-Dichlorobenzene														

CRQL = Contract Required Quantitation Limit

*Action Level Exists

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AR310309

Site Name: KOPPERS CO. FAC. PLANT

WATER SAMPLES
(ug/L)

Case #: 92129 Sampling Date(s): 09/18/95

To calculate sample quantitation limits:
(CRQL * Dilution Factor)

	Sample No.	32722	32723							
	Dilution Factor	1.0	1.0							
	Location	95-KNDRW8-QA	95-KNDRW22-QA							
CRQL	COMPOUND									
5	Phenol									
5	bis(2-Chloroethyl)ether									
5	2-Chlorophenol									
5	2-Methylphenol									
5	2,2'-oxybis(1-chloropropane)									
5	4-Methylphenol									
5	N-Nitroso-di-n-propylamine									
5	Hexachloroethane									
5	Nitrobenzene									
5	Isophorone									
5	2-Nitrophenol									
5	2,4-Dimethylphenol									
5	bis(2-Chloroethoxy)methane									
5	2,4-Dichlorophenol									
5	1,2,4-Trichlorobenzene									
5	Naphthalene									
5	4-Chloroaniline									

CRQL Contract Required Quantitation Limit

*Action Level Exists

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revised 07/90

AR310310

DATA SUMMARY FORM: B N A 2

Site Name: KOPPERS CO. FAC. PLANT

WATER SAMPLES
(ug/L)

Case #: 92129 Sampling Date(s): 09/18/95

To calculate sample quantitation limits:
(CRDL * Dilution Factor)

CRQL	COMPOUND									
	Sample No.	32722	32723							
	Dilution Factor	1.0	1.0							
	Location	95-KNDRW8-QA	95-KNDRW22-QA							
5	Hexachlorobutadiene									
5	4-Chloro-3-methylphenol									
5	2-Methylnaphthalene									
5	Hexachlorocyclopentadiene									
5	2,4,6-Trichlorophenol									
20	2,4,5-Trichlorophenol									
5	2-Chloronaphthalene									
20	2-Nitroaniline									
5	Dimethylphthalate									
5	Acenaphthylene									
5	2,6-Dinitrotoluene									
20	3-Nitroaniline									
5	Acenaphthene									
20	2,4-Dinitrophenol									
20	4-Nitrophenol									
5	Dibenzofuran									
5	2,4-Dinitrotoluene									
5	Diethylphthalate									
5	4-Chlorophenyl-phenylether									
5	Fluorene									
20	4-Nitroaniline									
	4,6-Dinitro-2-methylphenol									

C Contract Required Quantitation Limit

*Action Level Exists

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revised 07/90

AB310311

Site Name: KOPPERS CO. FAC. PLANT

WATER SAMPLES
(ug/L)

Case #: 92129 Sampling Date(s): 09/18/95

To calculate sample quantitation limits:
(CRDL * Dilution Factor)

	Sample No.	32722	32723							
	Dilution Factor	1.0	1.0							
	Location	95-KNDRW8-QA	95-KNDRW22-QA							
CRQL	COMPOUND									
5	N-Nitrosodiphenylamine									
5	4-Bromophenyl-phenylether									
5	*Hexachlorobenzene									
20	*Pentachlorophenol									
5	Phenanthrene									
5	Anthracene									
5	Di-n-butylphthalate									
5	Fluoranthene									
5	Pyrene									
5	Butylbenzylphthalate									
5	3,3'-Dichlorobenzidine									
5	Benzo(a)anthracene									
5	Chrysene									
5	bis(2-Ethylhexyl)phthalate									
5	Di-n-octylphthalate	2	B							
5	Benzo(b)fluoranthene									
5	Benzo(k)fluoranthene									
5	Benzo(a)pyrene									
5	Indeno(1,2,3-cd)pyrene									
5	Dibenz(a,h)anthracene									
5	Benzo(g,h,i)perylene									

C Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS
revised 07/90

Appendix C

Results as Reported by the Laboratory for all Target Compounds

1LCA

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

32721

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272307 Date Received: 09/27/95

Lab File ID: M272307V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	0.4	J
67-64-1	Acetone	3	JB
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
106-93-4	1,2-Dibromoethane	1	U
108-88-3	Toluene	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (total)	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
95-50-1	1,2-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U

1LCA

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

32722

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272308 Date Received: 09/27/95

Lab File ID: M272308V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	0.5	J
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	0.4	J
79-34-5	1,1,2,2-Tetrachloroethane	1	U
106-93-4	1,2-Dibromoethane	1	U
108-88-3	Toluene	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (total)	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
95-50-1	1,2-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U

1LCA

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

32723

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272310 Date Received: 09/27/95

Lab File ID: M272310V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
74-87-3	Chloromethane	0.5	J
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	0.3	J
79-34-5	1,1,2,2-Tetrachloroethane	1	U
106-93-4	1,2-Dibromoethane	1	U
108-88-3	Toluene	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (total)	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
95-50-1	1,2-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U

1LCB

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

32722

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272308 Date Received: 09/27/95

Lab File ID: R272308S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(UL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
108-95-2	Phenol	5	U
111-44-4	bis(-2-Chloroethyl)Ether	5	U
95-57-8	2-Chlorophenol	5	U
95-48-7	2-Methylphenol	5	U
108-60-1	2,2'-oxybis(1-Chloropropane)	5	U
106-44-5	4-Methylphenol	5	U
621-64-7	N-Nitroso-di-n-propylamine	5	U
67-72-1	Hexachloroethane	5	U
98-95-3	Nitrobenzene	5	U
78-59-1	Isophorone	5	U
88-75-5	2-Nitrophenol	5	U
105-67-9	2,4-Dimethylphenol	5	U
111-91-1	bis(2-Chloroethoxy)methane	5	U
120-83-2	2,4-Dichlorophenol	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
91-20-3	Naphthalene	5	U
106-47-8	4-Chloroaniline	5	U
87-68-3	Hexachlorobutadiene	5	U
59-50-7	4-Chloro-3-Methylphenol	5	U
91-57-6	2-Methylnaphthalene	5	U
77-47-4	Hexachlorocyclopentadiene	5	U
88-06-2	2,4,6-Trichlorophenol	5	U
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	5	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	5	U
208-96-8	Acenaphthylene	5	U
606-20-2	2,6-Dinitrotoluene	5	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	5	U
51-28-5	2,4-Dinitrophenol	20	U

1LCC

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

32722

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272308 Date Received: 09/27/95

Lab File ID: R272308S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(UL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	5	U
121-14-2	2,4-Dinitrotoluene	5	U
84-66-2	Diethylphthalate	5	U
7005-72-3	4-Chlorophenyl-phenylether	5	U
86-73-7	Fluorene	5	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-nitrosodiphenylamine (1)	5	U
101-55-3	4-Bromophenyl-phenylether	5	U
118-74-1	Hexachlorobenzene	5	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	5	U
120-12-7	Anthracene	5	U
84-74-2	Di-n-butylphthalate	5	U
206-44-0	Fluoranthene	5	U
129-00-0	Pyrene	5	U
85-68-7	Butylbenzylphthalate	5	U
91-94-1	3,3'-Dichlorobenzidine	5	U
56-55-3	Benzo(a)anthracene	5	U
218-01-9	Chrysene	5	U
117-81-7	bis(2-Ethylhexyl)phthalate	2	JB
117-84-0	Di-n-octylphthalate	5	U
205-99-2	Benzo(b)fluoranthene	5	U
207-08-9	Benzo(k)fluoranthene	5	U
50-32-8	Benzo(a)pyrene	5	U
193-39-5	Indeno(1,2,3-cd)pyrene	5	U
53-70-3	Dibenz(a,h)anthracene	5	U
191-24-2	Benzo(g,h,i)perylene	5	U

(1) - Cannot be separated from Diphenylamine

AR310318

1LCB

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

32723
~~32733~~ BD 11/22/95

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272310 Date Received: 09/27/95

Lab File ID: R272310S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(UL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
108-95-2	Phenol	5	U
111-44-4	bis(-2-Chloroethyl)Ether	5	U
95-57-8	2-Chlorophenol	5	U
95-48-7	2-Methylphenol	5	U
108-60-1	2,2'-oxybis(1-Chloropropane)	5	U
106-44-5	4-Methylphenol	5	U
621-64-7	N-Nitroso-di-n-propylamine	5	U
67-72-1	Hexachloroethane	5	U
98-95-3	Nitrobenzene	5	U
78-59-1	Isophorone	5	U
88-75-5	2-Nitrophenol	5	U
105-67-9	2,4-Dimethylphenol	5	U
111-91-1	bis(2-Chloroethoxy)methane	5	U
120-83-2	2,4-Dichlorophenol	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
91-20-3	Naphthalene	5	U
106-47-8	4-Chloroaniline	5	U
87-68-3	Hexachlorobutadiene	5	U
59-50-7	4-Chloro-3-Methylphenol	5	U
91-57-6	2-Methylnaphthalene	5	U
77-47-4	Hexachlorocyclopentadiene	5	U
88-06-2	2,4,6-Trichlorophenol	5	U
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	5	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	5	U
208-96-8	Acenaphthylene	5	U
606-20-2	2,6-Dinitrotoluene	5	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	5	U
51-28-5	2,4-Dinitrophenol	20	U

1LCC

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

32723 ~~32733~~ DB 11/22/95

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272310 Date Received: 09/27/95

Lab File ID: R272310S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(UL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	5	U
121-14-2	2,4-Dinitrotoluene	5	U
84-66-2	Diethylphthalate	5	U
7005-72-3	4-Chlorophenyl-phenylether	5	U
86-73-7	Fluorene	5	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-nitrosodiphenylamine (1)	5	U
101-55-3	4-Bromophenyl-phenylether	5	U
118-74-1	Hexachlorobenzene	5	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	5	U
120-12-7	Anthracene	5	U
84-74-2	Di-n-butylphthalate	5	U
206-44-0	Fluoranthene	5	U
129-00-0	Pyrene	5	U
85-68-7	Butylbenzylphthalate	5	U
91-94-1	3,3'-Dichlorobenzidine	5	U
56-55-3	Benzo(a)anthracene	5	U
218-01-9	Chrysene	5	U
117-81-7	bis(2-Ethylhexyl)phthalate	5	U
117-84-0	Di-n-octylphthalate	5	U
205-99-2	Benzo(b)fluoranthene	5	U
207-08-9	Benzo(k)fluoranthene	5	U
50-32-8	Benzo(a)pyrene	5	U
193-39-5	Indeno(1,2,3-cd)pyrene	5	U
53-70-3	Dibenz(a,h)anthracene	5	U
191-24-2	Benzo(g,h,i)perylene	5	U

(1) - Cannot be separated from Diphenylamine

Appendix D

Reviewed and Corrected Tentatively Identified Compounds

1LCE

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

32721

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272307 Date Received: 09/27/95

Lab File ID: M272307V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC. (ug/L)	Q
1.				
2.				
3.				
4.				
5.				
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27.				
28.				
29.				
30.				

1LCE

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

32722

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272308 Date Received: 09/27/95

Lab File ID: M272308V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC. (ug/L)	Q
~~1. 75-45-6~~	~~Methane, chlorodifluoro~~	~~2.513~~	~~3~~	~~NJ~~
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
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25.				
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29.				
30.				

DB 11/22/95

1LCF

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

32722

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272308 Date Received: 09/27/95

Lab File ID: R272308S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(uL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

Number TICs found: 3

CAS NUMBER	COMPOUND NAME	RT	EST. CONC. (ug/L)	Q
1.	Unknown	9.294	44	J
2.	Unknown	11.809	29	J
3. 10544-50-0	Sulfur, mol. (S8)	13.983	620	NJ
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
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16.				
17.				
18.				
19.				
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22.				
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24.				
25.				
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27.				
28.				
29.				
30.				

1LCE

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

32723

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272310 Date Received: 09/27/95

Lab File ID: M272310V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC. (ug/L)	Q
1.				
2.				
3.				
4.				
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6.				
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30.				

1LCF

EPA SAMPLE NO.

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

32733

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272310 Date Received: 09/27/95

Lab File ID: R272310S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(uL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

Number TICs found: 5

CAS NUMBER	COMPOUND NAME	RT	EST. CONC. (ug/L)	Q
1.	Unknown	9.305	64	J
2.	Unknown	9.433	22	J
3.	Unknown	11.831	54	J
4. 10544-50-0	Sulfur, mol. (S8)	13.928	1200	NJ
5.	Unknown	23.483	10	J
6.				
7.				
8.				
9.				
10.				
11.				
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Appendix E

Support Documentation

2LCB
LOW CONC. WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

	EPA SAMPLE NO.	(NBZ) %REC #	(FBP) %REC #	(TPH) %REC #	(PHL) %REC #	(2FP) %REC #	(TBP) %REC #	OTHER	TOT OUT
01	SBLKU2	104	115*	108	87	57	96		1
02	32722	50	55	73	53	52	47		0
03	32733	71	77	106	63	70	78		0
04	SLCSA1	100	117*	97	80	112*	92		2
05									
06									
07									
08									
09									
10									
11									
12									
13									
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25									
26									
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28									
29									
30									

		QC LIMITS
(NBZ)	= Nitrobenzene-d5	(40-112)
(FBP)	= 2-Fluorobiphenyl	(42-110)
(TPH)	= Terphenyl-d14	(24-140)
(PHL)	= Phenol-d5	(17-113)
(2FP)	= 2-Fluorophenol	(16-110)
(TBP)	= 2,4,6-Tribromophenol	(18-126)
	= N/A	

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate diluted out

FORM II LCSV 10/92

TABLE I

ENVIRONMENTAL PROTECTION AGENCY REGION III
CALIBRATION OUTLIERS
SEMIVOLATILE HSL COMPOUNDS (Part 1 of 2)

CASE No. 92129 CONTRACTOR ESAT

Instrument# R	Init. Cal.			Cont. Cal.			Cont. Cal.		
DATE/TIME:	10/25/95- 13:13			10/26/95 - 12:09					
	RF	%RSD	*	RF	%D	*	RF	%D	*
Phenol									
bis(2-Chloroethyl)ether									
2-Chlorophenol									
1,3-Dichlorobenzene									
1,4-Dichlorobenzene									
1,2-Dichlorobenzene									
2-Methylphenol									
2,2'-Oxybis(1-Chloropropane)									
4-Methylphenol									
N-Nitroso-di-n-propylamine									
Hexachloroethane									
Nitrobenzene									
Isophorone									
2-Nitrophenol									
2,4-Dimethylphenol									
bis(2-Chloroethoxy)methane									
2,4-Dichlorophenol									
1,2,4-Trichlorobenzene									
Naphthalene									
4-Chloroaniline									
Hexachlorobutadiene									
4-Chloro-3-Methylphenol									
2-Methylnaphthalene									
Hexachlorocyclopentadiene									
2,4,6-Trichlorophenol									
2,4,5-Trichlorophenol									
2-Chloronaphthalene									
2-Nitroaniline									
Dimethylphthalate									
Acenaphthylene									
2,6-Dinitrotoluene									
3-Nitroaniline									
Acenaphthene									
2,4-Dinitrophenol					28.7	C			
4-Nitrophenol									

AFFECTED SAMPLES: All samples on this page

SBLKU2
32722
32723

Reviewer Initials/Date: DSB 11/27/95

* See last page of this table for DEFINITION OF CODES.

TABLE I

ENVIRONMENTAL PROTECTION AGENCY REGION III
CALIBRATION OUTLIERS
SEMIVOLATILE HSL COMPOUNDS (Part 2 of 2)

CASE No. 92129 CONTRACTOR ESAT

Instrument# R	Init. Cal.			Cont. Cal.			Cont. Cal.		
DATE/TIME:	10/25/95- 13:13			10/26/95 - 12:09					
	RF	%RSD	*	RF	%D	*	RF	%D	*
Dibenzofuran									
2,4-Dinitrotoluene									
Diethylphthalate									
4-Chlorophenyl-phenylether									
Fluorene									
4-Nitroaniline									
4,6-Dinitro-2-methylphenol									
N-Nitrosodiphenylamine									
4-Bromophenyl-phenylether									
Hexachlorobenzene									
Pentachlorophenol									
Phenanthrene									
Anthracene									
Carbazole									
Di-n-butylphthalate									
Fluoranthene									
Pyrene									
Butylbenzylphthalate									
3,3'-Dichlorobenzidine									
Benzo(a)anthracene									
Chrysene									
bis(2-Ethylhexyl)phthalate									
Di-n-octylphthalate					27.6	C			
Benzo(b)fluoranthene									
Benzo(k)fluoranthene									
Benzo(a)pyrene									
Indeno(1,2,3-cd)pyrene									
Dibenz(a,h)anthracene									
Benzo(g,h,i)perylene									

AFFECTED SAMPLES: All samples on this page

SBLK02
32722
32723

Reviewer Initials/Date: DSB 11/27/95

* See last page of this table for DEFINITION OF CODES.

6LCA

LOW CONC. WATER VOLATILE ORGANICS INITIAL CALIBRATION SUMMARY

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Instrument ID: M Calibration Date(s): 09/22/95

LAB FILE ID: RRF1 =MDZ001HV.D RRF2 =MDV002HV.D
RRF5 =MDV005B2HV.D RRF10=MDZ010HV.D RRF25=MDZ020HV.D

COMPOUND	RRF1	RRF2	RRF5	RRF10	RRF25	$\overline{RRF}$	% RSD
Chloromethane	0.420	0.395	0.421	0.394	0.391	0.404	3.7
Bromomethane *	0.337	0.315	0.340	0.323	0.328	0.329	3.1*
Vinyl Chloride *	0.394	0.371	0.411	0.382	0.386	0.389	3.8*
Chloroethane	0.243	0.245	0.265	0.247	0.245	0.249	3.6
Methylene Chloride	0.484	0.437	0.386	0.361	0.358	0.405	13.4
Acetone	0.097	0.091	0.091	0.085	0.082	0.089	6.5
Carbon Disulfide	0.995	0.989	1.075	1.025	1.059	1.028	3.7
1,1-Dichloroethene *	0.289	0.297	0.323	0.302	0.304	0.303	4.1*
1,1-Dichloroethane *	0.730	0.725	0.771	0.749	0.755	0.746	2.5*
cis-1,2-Dichloroethene	0.329	0.331	0.355	0.348	0.354	0.343	3.7
trans-1,2-Dichloroethene	0.313	0.320	0.350	0.336	0.336	0.331	4.4
Chloroform *	0.726	0.745	0.821	0.782	0.798	0.774	5.0*
1,2-Dichloroethane *	0.501	0.504	0.562	0.551	0.557	0.535	5.6*
2-Butanone	0.166	0.149	0.167	0.165	0.160	0.161	4.7
Bromochloromethane *	0.199	0.211	0.224	0.238	0.237	0.222	7.5*
1,1,1-Trichloroethane *	0.742	0.744	0.802	0.761	0.763	0.763	3.1*
Carbon Tetrachloride *	0.707	0.728	0.779	0.741	0.754	0.742	3.6*
Bromodichloromethane *	0.820	0.849	0.933	0.927	0.954	0.897	6.5*
1,2-Dichloropropane	0.530	0.556	0.589	0.563	0.563	0.560	3.8
cis-1,3-Dichloropropene *	0.697	0.713	0.786	0.758	0.783	0.748	5.4*
Trichloroethene *	0.494	0.515	0.540	0.509	0.513	0.514	3.2*
Dibromochloromethane *	0.606	0.648	0.742	0.750	0.793	0.708	11.0*
1,1,2-Trichloroethane *	0.378	0.384	0.419	0.408	0.412	0.400	4.5*
Benzene *	1.245	1.247	1.300	1.215	1.217	1.245	2.8*
trans-1,3-Dichloropropene *	0.607	0.621	0.701	0.681	0.700	0.662	6.7*
Bromoform *	0.366	0.404	0.457	0.485	0.534	0.449	14.8*
4-Methyl-2-Pentanone	0.486	0.510	0.528	0.528	0.530	0.516	3.7
2-Hexanone	0.342	0.350	0.361	0.358	0.357	0.354	2.2
Tetrachloroethene *	0.556	0.547	0.593	0.547	0.566	0.562	3.4*
1,1,2,2-Tetrachloroethane *	0.661	0.670	0.730	0.716	0.747	0.705	5.4*
1,2-Dibromoethane *	0.614	0.600	0.647	0.646	0.666	0.635	4.2*
Toluene *	1.207	1.187	1.288	1.195	1.218	1.219	3.3*
Chlorobenzene *	0.871	0.865	0.930	0.901	0.928	0.899	3.4*
Ethylbenzene *	1.569	1.548	1.665	1.545	1.590	1.583	3.1*
Styrene *	0.811	0.813	0.897	0.880	0.923	0.865	5.8*
Xylene (total) *	0.567	0.516	0.531	0.498	0.514	0.525	5.0*
1,3-Dichlorobenzene *	1.416	1.402	1.462	1.395	1.426	1.420	1.8*
1,4-Dichlorobenzene *	1.527	1.484	1.591	1.493	1.527	1.524	2.8*
1,2-Dichlorobenzene *	1.275	1.260	1.359	1.324	1.323	1.308	3.1*
1,2-Dibromo-3-chloropropane	0.283	0.252	0.260	0.261	0.261	0.263	4.3
4-Bromofluorobenzene *	0.401	0.405	0.439	0.432	0.461	0.427	5.8*

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

7LCA

LOW CONC. WATER VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Instrument ID: M Calibration Date: 10/02/95 Time: 1325

Lab File ID: MDV005H3HV.D Init. Calibration Date(s): 09/22/95

COMPOUND	$\overline{RRF}$	RRF5	MIN RRF	%D	MAX %D
Chloromethane	0.404	0.340		15.9	
Bromomethane	0.329	0.296	0.100	10.0	30.0
Vinyl Chloride	0.389	0.343	0.100	11.7	30.0
Chloroethane	0.249	0.246		1.0	
Methylene Chloride	0.405	0.356		12.1	
Acetone	0.089	0.068		24.1	
Carbon Disulfide	1.028	1.016		1.2	
1,1-Dichloroethene	0.303	0.309	0.100	-2.1	30.0
1,1-Dichloroethane	0.746	0.752	0.200	-0.8	30.0
cis-1,2-Dichloroethene	0.343	0.359		-4.6	
trans-1,2-Dichloroethene	0.331	0.347		-4.8	
Chloroform	0.774	0.787	0.200	-1.6	30.0
1,2-Dichloroethane	0.535	0.528	0.100	1.3	30.0
2-Butanone	0.161	0.146		9.3	
Bromochloromethane	0.222	0.224	0.050	-1.2	30.0
1,1,1-Trichloroethane	0.763	0.795	0.100	-4.3	30.0
Carbon Tetrachloride	0.742	0.780	0.100	-5.2	30.0
Bromodichloromethane	0.897	0.921	0.200	-2.7	30.0
1,2-Dichloropropane	0.560	0.572		-2.1	
cis-1,3-Dichloropropene	0.748	0.782	0.200	-4.6	30.0
Trichloroethene	0.514	0.538	0.300	-4.6	30.0
Dibromochloromethane	0.708	0.746	0.100	-5.5	30.0
1,1,2-Trichloroethane	0.400	0.415	0.100	-3.6	30.0
Benzene	1.245	1.286	0.500	-3.3	30.0
trans-1,3-Dichloropropene	0.662	0.690	0.100	-4.3	30.0
Bromoform	0.449	0.477	0.050	-6.3	30.0
4-Methyl-2-Pentanone	0.516	0.543		-5.1	
2-Hexanone	0.354	0.358		-1.1	
Tetrachloroethene	0.562	0.602	0.200	-7.1	30.0
1,1,2,2-Tetrachloroethane	0.705	0.733	0.100	-3.9	30.0
1,2-Dibromoethane	0.635	0.643	0.100	-1.3	30.0
Toluene	1.219	1.266	0.400	-3.8	30.0
Chlorobenzene	0.899	0.948	0.500	-5.4	30.0
Ethylbenzene	1.583	1.653	0.100	-4.4	30.0
Styrene	0.865	0.897	0.300	-3.7	30.0
Xylene (total)	0.525	0.515	0.300	1.9	30.0
1,3-Dichlorobenzene	1.420	1.453	0.600	-2.3	30.0
1,4-Dichlorobenzene	1.524	1.551	0.500	-1.8	30.0
1,2-Dichlorobenzene	1.308	1.325	0.400	-1.3	30.0
1,2-Dibromo-3-chloropropane	0.263	0.264		-0.4	
4-Bromofluorobenzene	0.427	0.440	0.200	-3.1	30.0

VBLKM9
32721
32722
32723
VSBLKØ1

All other compounds must meet a minimum RRF of 0.010.

AR310332

DEFINITION OF CODES USED IN TABLE I

I = %RSD exceeded 30% in the initial calibration, positive results are qualified "J". When the %RSD exceeded 50%, quantitation limits are qualified "UJ".

C = %D exceeded 25% in the continuing calibration, positive results are qualified "J". When the %D exceeded 50%, quantitation limits are qualified "UJ".

F = RF less than 0.05 in the calibration. All quantitation limits are qualified "R" and positive results are qualified "L".

+ = The "B" qualifier, denoting blank contamination, supersedes the qualifier issued in this table.

R = The "R" qualifier, denoting unusable results, supersedes the qualifier issued in this table.

6LCB

LOW CONC. WATER SEMIVOLATILE ORGANICS INITIAL CALIBRATION SUMMARY

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Instrument ID: R Calibration Date(s): 10/25/95

Calibration Times: 1313 1514

LAB FILE ID: RRF5 =RDK005B2S.D RRF10=RDK010BS.D
RRF20=RDK020BS.D RRF50=RKI050BS.D RRF80=RDK080BS.D

COMPOUND		RRF5	RRF10	RRF20	RRF50	RRF80	$\overline{RRF}$	% RSD
Phenol	*	0.990	1.039	1.036	1.053	1.069	1.037	2.8*
bis(-2-Chloroethyl)Ether	*	0.964	0.937	0.993	0.967	1.014	0.975	3.0*
2-Chlorophenol	*	0.961	0.988	1.011	1.011	1.072	1.009	4.1*
2-Methylphenol	*	0.688	0.792	0.750	0.754	0.784	0.754	5.4*
2,2'-oxybis(1-Chloropropane)		1.363	1.256	1.187	1.156	1.076	1.208	9.0
4-Methylphenol	*	0.806	0.816	0.771	0.772	0.839	0.801	3.6*
N-Nitroso-di-n-propylamine	*	0.887	0.871	0.881	0.880	0.908	0.885	1.6*
Hexachloroethane	*	0.741	0.732	0.756	0.742	0.775	0.749	2.3*
Nitrobenzene	*	0.458	0.480	0.504	0.496	0.493	0.486	3.6*
Isophorone	*	0.697	0.734	0.748	0.751	0.764	0.739	3.5*
2-Nitrophenol	*	0.145	0.157	0.172	0.182	0.177	0.167	9.2*
2,4-Dimethylphenol	*	0.313	0.324	0.324	0.363	0.339	0.333	5.8*
bis(2-Chloroethoxy)methane	*	0.355	0.366	0.338	0.388	0.370	0.364	5.0*
2,4-Dichlorophenol	*	0.227	0.241	0.237	0.265	0.290	0.252	10.0*
1,2,4-Trichlorobenzene	*	0.309	0.317	0.321	0.342	0.354	0.329	5.7*
Naphthalene	*	0.793	0.839	0.819	0.902	0.954	0.861	7.6*
4-Chloroaniline		0.311	0.326	0.329	0.335	0.363	0.333	5.7
Hexachlorobutadiene		0.274	0.295	0.312	0.307	0.325	0.302	6.4
4-Chloro-3-Methylphenol	*	0.270	0.291	0.324	0.322	0.354	0.312	10.4*
2-Methylnaphthalene	*	0.524	0.532	0.579	0.568	0.628	0.566	7.4*
Hexachlorocyclopentadiene		0.519	0.510	0.579	0.610	0.575	0.558	7.6
2,4,6-Trichlorophenol	*	0.328	0.325	0.373	0.369	0.396	0.358	8.6*
2,4,5-Trichlorophenol	*	0.441	0.453	0.479	0.416	0.405	0.439	6.7*
2-Chloronaphthalene	*	0.855	0.878	0.921	0.955	0.972	0.916	5.4*
2-Nitroaniline		0.545	0.531	0.558	0.509	0.498	0.528	4.7
Dimethylphthalate		1.205	1.172	1.213	1.232	1.257	1.216	2.6
Acenaphthylene	*	1.404	1.392	1.457	1.484	1.537	1.455	4.1*
2,6-Dinitrotoluene	*	0.205	0.233	0.270	0.274	0.299	0.256	14.4*
3-Nitroaniline		0.320	0.323	0.344	0.305	0.312	0.321	4.6
Acenaphthene	*	0.810	0.823	0.894	0.909	0.932	0.873	6.2*
2,4-Dinitrophenol		0.191	0.224	0.254	0.226	0.244	0.228	10.5
4-Nitrophenol		0.531	0.546	0.593	0.517	0.535	0.545	5.3
Dibenzofuran	*	1.246	1.281	1.366	1.346	1.437	1.335	5.6*
2,4-Dinitrotoluene	*	0.349	0.371	0.402	0.384	0.415	0.384	6.7*
Diethylphthalate		1.431	1.384	1.494	1.456	1.520	1.457	3.6

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

FORM VI LCSV-1

6LCC

LOW CONC. WATER SEMIVOLATILE ORGANICS INITIAL CALIBRATION SUMMARY

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Instrument ID: R Calibration Date(s): 10/25/95

Calibration Times: 1313 1514

LAB FILE ID: RRF5 =RDK005B2S.D RRF10=RDK010BS.D
RRF20=RDK020BS.D RRF50=RKI050BS.D RRF80=RDK080BS.D

COMPOUND	RRF5	RRF10	RRF20	RRF50	RRF80	$\overline{RRF}$	% RSD
4-Chlorophenyl-phenylether *	0.600	0.561	0.646	0.653	0.705	0.633	8.7*
Fluorene *	1.008	1.016	1.087	1.103	1.206	1.084	7.4*
4-Nitroaniline	0.325	0.314	0.355	0.302	0.297	0.319	7.2
4,6-Dinitro-2-methylphenol	0.180	0.191	0.209	0.194	0.218	0.198	7.6
N-nitrosodiphenylamine (1)	0.439	0.467	0.483	0.491	0.559	0.488	9.1
4-Bromophenyl-phenylether *	0.273	0.272	0.293	0.302	0.331	0.294	8.2*
Hexachlorobenzene *	0.372	0.372	0.394	0.402	0.413	0.391	4.7*
Pentachlorophenol *	0.255	0.284	0.304	0.276	0.291	0.282	6.6*
Phenanthrene *	0.861	0.929	0.951	1.036	1.123	0.980	10.4*
Anthracene *	0.885	0.927	0.957	1.009	1.074	0.971	7.6*
Di-n-butylphthalate	1.424	1.380	1.551	1.619	1.627	1.520	7.4
Fluoranthene *	1.042	1.001	1.158	1.240	1.212	1.131	9.3*
Pyrene *	0.915	0.957	0.937	1.003	1.044	0.971	5.4*
Butylbenzylphthalate	0.507	0.534	0.553	0.585	0.582	0.552	6.0
3,3'-Dichlorobenzidine	0.345	0.326	0.330	0.332	0.332	0.333	2.1
Benzo(a)anthracene *	0.893	0.895	0.985	0.989	0.989	0.950	5.4*
Chrysene *	0.864	0.847	0.915	0.936	0.947	0.902	4.9*
bis(2-Ethylhexyl)phthalate	0.676	0.646	0.749	0.803	0.739	0.723	8.6
Di-n-octylphthalate	0.899	0.953	1.051	1.158	1.083	1.029	10.0
Benzo(b)fluoranthene *	0.833	0.913	0.969	0.939	1.003	0.932	7.0*
Benzo(k)fluoranthene *	0.880	0.838	0.923	1.039	1.060	0.948	10.3*
Benzo(a)pyrene *	0.732	0.769	0.842	0.881	0.935	0.832	9.9*
Indeno(1,2,3-cd)pyrene *	0.937	0.913	1.083	1.106	1.260	1.060	13.3*
Dibenz(a,h)anthracene *	0.784	0.727	0.860	0.887	1.020	0.856	13.0*
Benzo(g,h,i)perylene *	0.773	0.743	0.885	0.897	1.039	0.867	13.5*
Nitrobenzene-d5	0.454	0.484	0.518	0.509	0.523	0.498	5.8
2-Fluorobiphenyl *	1.020	0.991	1.108	1.147	1.141	1.081	6.6*
Terphenyl-d14 *	0.740	0.806	0.770	0.835	0.848	0.800	5.6*
Phenol-d5 *	1.081	1.046	1.087	1.103	1.113	1.086	2.4*
2-Fluorophenol *	0.835	0.864	0.911	0.983	0.967	0.912	7.0*
2,4,6-Tribromophenol	0.417	0.417	0.454	0.388	0.381	0.411	7.0

(1) - Cannot be separated from Diphenylamine
* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

7LCB

LOW CONC. WATER SEMIVOLATILE CONTINUING CALIBRATION SUMMARY

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Instrument ID: R Calibration Date: 10/26/95 Time: 1209

Lab File ID: REK020ABS.D Init. Calibration Date(s): 10/25/95

Init. Calibration Times: 1313 1514

SBLKU2
32722
32723

COMPOUND	$\overline{RRF}$	RRF20	MIN RRF	%D	MAX %D
Phenol	1.037	1.240	0.800	-19.6	25.0
bis(-2-Chloroethyl)Ether	0.975	1.167	0.700	-19.7	25.0
2-Chlorophenol	1.009	1.144	0.700	-13.4	25.0
2-Methylphenol	0.754	0.913	0.700	-21.2	25.0
2,2'-oxybis(1-Chloropropane)	1.208	1.363		-12.9	
4-Methylphenol	0.801	0.942	0.600	-17.6	25.0
N-Nitroso-di-n-propylamine	0.885	1.028	0.500	-16.2	25.0
Hexachloroethane	0.749	0.823	0.300	-9.9	25.0
Nitrobenzene	0.486	0.525	0.200	-7.9	25.0
Isophorone	0.739	0.834	0.400	-12.9	25.0
2-Nitrophenol	0.167	0.194	0.100	-16.1	30.0
2,4-Dimethylphenol	0.333	0.402	0.200	-20.7	30.0
bis(2-Chloroethoxy)methane	0.364	0.417	0.300	-14.6	25.0
2,4-Dichlorophenol	0.252	0.294	0.200	-16.5	25.0
1,2,4-Trichlorobenzene	0.329	0.362	0.200	-10.1	25.0
Naphthalene	0.861	0.968	0.700	-12.4	25.0
4-Chloroaniline	0.333	0.380		-14.3	
Hexachlorobutadiene	0.302	0.320		-5.8	
4-Chloro-3-Methylphenol	0.312	0.353	0.200	-13.1	25.0
2-Methylnaphthalene	0.566	0.645	0.400	-14.0	25.0
Hexachlorocyclopentadiene	0.558	0.618		-10.7	
2,4,6-Trichlorophenol	0.358	0.396	0.200	-10.6	25.0
2,4,5-Trichlorophenol	0.439	0.485	0.200	-10.4	25.0
2-Chloronaphthalene	0.916	1.024	0.800	-11.7	25.0
2-Nitroaniline	0.528	0.578		-9.4	
Dimethylphthalate	1.216	1.402		-15.3	
Acenaphthylene	1.455	1.605	1.300	-10.3	25.0
2,6-Dinitrotoluene	0.256	0.306	0.200	-19.4	25.0
3-Nitroaniline	0.321	0.376		-17.2	
Acenaphthene	0.873	0.952	0.800	-9.0	25.0
2,4-Dinitrophenol	0.228	0.293		-28.7	
4-Nitrophenol	0.545	0.637		-16.9	
Dibenzofuran	1.335	1.476	0.800	-10.5	25.0
2,4-Dinitrotoluene	0.384	0.447	0.200	-16.4	30.0
Diethylphthalate	1.457	1.660		-13.9	

All other compounds must meet a minimum RRF of 0.010.

7LCC

LOW CONC. WATER SEMIVOLATILE CONTINUING CALIBRATION SUMMARY

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Instrument ID: R Calibration Date: 10/26/95 Time: 1209

Lab File ID: REK020ABS.D Init. Calibration Date(s): 10/25/95

Init. Calibration Times: 1313 1514

COMPOUND	$\overline{RRF}$	RRF20	MIN RRF	%D	MAX %D
4-Chlorophenyl-phenylether	0.633	0.706	0.400	-11.6	25.0
Fluorene	1.084	1.201	0.900	-10.8	25.0
4-Nitroaniline	0.319	0.385		-20.7	
4,6-Dinitro-2-methylphenol	0.198	0.234		-17.7	
N-nitrosodiphenylamine (1)	0.488	0.542		-11.2	
4-Bromophenyl-phenylether	0.294	0.318	0.100	-8.0	25.0
Hexachlorobenzene	0.391	0.423	0.100	-8.4	25.0
Pentachlorophenol	0.282	0.339	0.050	-20.3	25.0
Phenanthrene	0.980	1.090	0.700	-11.2	25.0
Anthracene	0.971	1.076	0.700	-10.9	25.0
Di-n-butylphthalate	1.520	1.799		-18.3	
Fluoranthene	1.131	1.403	0.600	-24.1	25.0
Pyrene	0.971	1.104	0.600	-13.7	25.0
Butylbenzylphthalate	0.552	0.644		-16.7	
3,3'-Dichlorobenzidine	0.333	0.375		-12.5	
Benzo(a)anthracene	0.950	1.105	0.800	-16.3	25.0
Chrysene	0.902	1.005	0.700	-11.5	25.0
bis(2-Ethylhexyl)phthalate	0.723	0.854		-18.1	
Di-n-octylphthalate	1.029	1.313		-27.6	
Benzo(b)fluoranthene	0.932	1.068	0.700	-14.6	25.0
Benzo(k)fluoranthene	0.948	1.093	0.700	-15.3	25.0
Benzo(a)pyrene	0.832	0.939	0.700	-12.9	25.0
Indeno(1,2,3-cd)pyrene	1.060	1.083	0.500	-2.2	25.0
Dibenz(a,h)anthracene	0.856	0.892	0.400	-4.2	25.0
Benzo(g,h,i)perylene	0.867	0.887	0.500	-2.3	25.0
Nitrobenzene-d5	0.498	0.550		-10.6	
2-Fluorobiphenyl	1.081	1.129	0.700	-4.4	25.0
Terphenyl-d14	0.800	0.892	0.500	-11.5	25.0
Phenol-d5	1.086	1.291	0.800	-18.9	25.0
2-Fluorophenol	0.912	1.010	0.600	-10.7	25.0
2,4,6-Tribromophenol	0.411	0.492		-19.6	

(1) Cannot be separated from Diphenylamine
All other compounds must meet a minimum RRF of 0.010.

Inchcape Testing Services
Aquatec Laboratories

55 South Park Drive
Colchester, VT 05446
Tel. 802-655-1205
Fax 802-655-1248

October 31, 1995

Mr. David Lubianez
Department of the Army
N.E. Div., Corps of Engineers
424 Trapelo Raod
Waltham, MA 02254

Re: Client Project 95-315 Call 33
Aquatec Project No. 92129
Case No. 92129; SDG No. 54014

Dear Mr. Lubianez:

Enclosed are the analytical results of samples received intact by Inchcape Testing Services-Aquatec Laboratory on September 27, 1995. Laboratory numbers and quality control samples have been assigned and designated as follows:

Client Sample ID	Laboratory Lab No.	Sample Matrix
Samples Received on September 27, 1995 ETR No.: 54014		
32721	272307	Liquid
32722	272308	Liquid
32722F	272309	Filtrate
32723	272310	Liquid
32723F	272311	Filtrate
LCS	272312	Liquid
VSBLK01	272313	Water

The volatile organic laboratory control sample (LCS) has been renamed VLCSA1. For the semivolatile analysis, the LCS was renamed FLCSA1.

The initial semivolatile organic analysis of the method blank (SBLKU2) and LCS (FLCSA1) samples exhibited surrogate recoveries above the calibration range. The samples were reanalyzed using a new internal standard formulation. Surrogate recoveries were similar to the initially observed. This situation was communicated to David Lubianez on October 31, 1995 by Scot Swanborn. Since the samples were beyond holding time, Mr. Lubianez asked that the no further action be taken. The results of the reanalysis have been informally presented in the sample handling section of this submittal.

If there are any questions regarding this submittal, please contact Scot Swanborn at (802) 655-1203.

Sincerely,

Karen R. Chirgwin

Karen R. Chirgwin
Laboratory Operations Director

KRC/jg

Enclosure

92129B30CT95

S. ARMY CORPS OF ENGINEERS

-[illegible] 95-315 and Call 33

CHAIN OF CUSTODY RECORD

000003

PROJ. NO.	PROJECT NAME KOPPERS
	SAMPLERS: (Signature) OTHERS

ENV # ~~STA. NO.~~	DATE 1995	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TOL VOC, USEPA, CLP	TOL, BNA, USEPA, CLP	TOTAL TAL METALS USEPA CLP	DISSOLVED TAL METALS USEPA			REMARKS
32721	9-18	1320			95-KNDRW8-TB	2	X						KOPPERS - WATER
32722	9-18	1320			95-KNDRW8-QA	9	X	X	X	X			
32723	9-18	1330			95-KNDRW22-QA	9	X	X	X	X			

NOTE: ACHIEVE LOWEST POSSIBLE DETECTION LIMIT FOR PENTACHLOROPHENOL - SEE S. SWANBORN

ADDITIONALLY, THE ANALYSES LISTED ABOVE ARE ALL FOR LOW LEVEL CLP ANALYSIS.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9-26-95 1500	UPS NEXT DAY AIR 0698 9132 805-841			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature]	9/27/95 1000	Samples sent to Equatec	

Distribution: Original Accompanies Shipment; Copy 1 to Sample Custodian; Copy 2 to Coordinator Field Files

AR310340

3LCA

EPA SAMPLE NO.

LOW CONC. WATER VOLATILE LAB CONTROL SAMPLE RECOVERY

VLCSA1

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272312 LCS Lot No.: CM10029504

Lab File ID: M272312V.D Data Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

LCS Aliquot: 10 (uL)

COMPOUND	SPIKE ADDED (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Vinyl Chloride	5	6	120	60-140
1,2-Dichloroethane	5	5	100	60-140
Carbon Tetrachloride	5	5	100	60-140
1,2-Dichloropropane	5	5	100	60-140
cis-1,3-Dichloropropene	5	5	100	60-140
Trichloroethene	5	5	100	60-140
1,1,2-Trichloroethane	5	5	100	60-140
Benzene	5	5	100	60-140
Bromoform	5	4	80	60-140
Tetrachloroethene	5	5	100	60-140
1,2-Dibromoethane	5	5	100	60-140
1,4-Dichlorobenzene	5	5	100	60-140

Column to be used to flag LCS recovery with an asterisk

* Values outside of QC limits

LCS Recovery: 0 outside limits out of 12 total.

COMMENTS:

3LCB

LOW CONC. WATER SEMIVOLATILE LAB CONTROL SAMPLE RECOVERY

EPA SAMPLE NO.

SLCSA1

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272312 LCS Lot No.: GE10029502

Lab File ID: R272312S.d Date Extracted: 10/02/95

LCS Aliquot: 1000 (uL) Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000 (uL) Dilution Factor: 1.0

Injection Volume: 1.0 (uL) pH:

COMPOUND	AMOUNT ADDED (ng)	AMOUNT RECOVERED (ng)	%REC	#	QC LIMITS
Phenol	40	34	85		44-120
bis(-2-Chloroethyl)Ethe	20	18	90		64-110
2-Chlorophenol	40	35	88		58-110
N-Nitroso-di-n-prop.(1)	20	20	100		34-102
Hexachloroethane	20	18	90	*	32- 77
Isophorone	20	15	75		49-110
1,2,4-Trichlorobenzene	20	18	90		44- 96
Naphthalene	20	18	90		56-160
4-Chloroaniline	20	13	65		35- 98
2,4,6-Trichlorophenol	40	42	105		65-110
2,4-Dinitrotoluene	20	19	95		61-140
Diethylphthalate	20	21	105	*	76-104
N-nitrosodiphenylamine	20	18	90		35-120
Hexachlorobenzene	20	23	115	*	30- 95
Benzo(a)pyrene	20	17	85		55- 92

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

LCS Recovery: 3 outside limits out of 15

COMMENTS:

AR310342

1LCA

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VLCSA1

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272312 Date Received: / /

Lab File ID: M272312V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	6	
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	5	
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	5	
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	5	
10061-01-5	cis-1,3-Dichloropropene	5	
79-01-6	Trichloroethene	5	
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	5	
71-43-2	Benzene	5	
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	4	
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	5	
79-34-5	1,1,2,2-Tetrachloroethane	1	U
106-93-4	1,2-Dibromoethane	5	
108-88-3	Toluene	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (total)	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	5	
95-50-1	1,2-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U

1LCB

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLCSA1

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272312 Date Received: / /

Lab File ID: R272312S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(UL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
108-95-2	Phenol	34	
111-44-4	bis(-2-Chloroethyl)Ether	18	
95-57-8	2-Chlorophenol	35	
95-48-7	2-Methylphenol	5	U
108-60-1	2,2'-oxybis(1-Chloropropane)	5	U
106-44-5	4-Methylphenol	5	U
621-64-7	N-Nitroso-di-n-propylamine	20	
67-72-1	Hexachloroethane	18	
98-95-3	Nitrobenzene	5	U
78-59-1	Isophorone	15	
88-75-5	2-Nitrophenol	5	U
105-67-9	2,4-Dimethylphenol	5	U
111-91-1	bis(2-Chloroethoxy)methane	5	U
120-83-2	2,4-Dichlorophenol	5	U
120-82-1	1,2,4-Trichlorobenzene	18	
91-20-3	Naphthalene	18	
106-47-8	4-Chloroaniline	13	
87-68-3	Hexachlorobutadiene	5	U
59-50-7	4-Chloro-3-Methylphenol	5	U
91-57-6	2-Methylnaphthalene	5	U
77-47-4	Hexachlorocyclopentadiene	5	U
88-06-2	2,4,6-Trichlorophenol	42	
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	5	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	5	U
208-96-8	Acenaphthylene	5	U
606-20-2	2,6-Dinitrotoluene	5	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	5	U
51-28-5	2,4-Dinitrophenol	20	U

1LCC

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLCSA1

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272312 Date Received: / /

Lab File ID: R272312S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(UL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	5	U
121-14-2	2,4-Dinitrotoluene	19	
84-66-2	Diethylphthalate	21	
7005-72-3	4-Chlorophenyl-phenylether	5	U
86-73-7	Fluorene	5	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-nitrosodiphenylamine (1)	18	
101-55-3	4-Bromophenyl-phenylether	5	U
118-74-1	Hexachlorobenzene	23	
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	5	U
120-12-7	Anthracene	5	U
84-74-2	Di-n-butylphthalate	5	U
206-44-0	Fluoranthene	5	U
129-00-0	Pyrene	5	U
85-68-7	Butylbenzylphthalate	5	U
91-94-1	3,3'-Dichlorobenzidine	5	U
56-55-3	Benzo(a)anthracene	5	U
218-01-9	Chrysene	5	U
117-81-7	bis(2-Ethylhexyl)phthalate	2	JB
117-84-0	Di-n-octylphthalate	5	U
205-99-2	Benzo(b)fluoranthene	5	U
207-08-9	Benzo(k)fluoranthene	5	U
50-32-8	Benzo(a)pyrene	17	
193-39-5	Indeno(1,2,3-cd)pyrene	5	U
53-70-3	Dibenz(a,h)anthracene	5	U
191-24-2	Benzo(g,h,i)perylene	5	U

(1) - Cannot be separated from Diphenylamine

1LCA

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKM9

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: VBLKM9 Date Received: / /

Lab File ID: MDVB002HV.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	2	J
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
106-93-4	1,2-Dibromoethane	1	U
108-88-3	Toluene	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (total)	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
95-50-1	1,2-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U

1LCE

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKM9

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: VBLKM9 Date Received: / /

Lab File ID: MDVB002HV.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC. (ug/L)	Q
1.				
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1LCA

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VSBLK01

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272313 Date Received: / /

Lab File ID: M272313V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	3	J
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
106-93-4	1,2-Dibromoethane	1	U
108-88-3	Toluene	0.3	J
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (total)	0.2	J
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
95-50-1	1,2-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U

1LCE

LOW CONC. WATER VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VSBLK01

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: 272313 Date Received: / /

Lab File ID: M272313V.D Date Analyzed: 10/02/95

Purge Volume: 5.0 (mL) Dilution Factor: 1.0

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC. (ug/L)	Q
1.				
2.				
3.				
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1LCB

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKU2

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: SBLKU2 Date Received: / /

Lab File ID: RB1002U2S.D Date Extracted: 10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(UL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
108-95-2	Phenol	5	U
111-44-4	bis(-2-Chloroethyl)Ether	5	U
95-57-8	2-Chlorophenol	5	U
95-48-7	2-Methylphenol	5	U
108-60-1	2,2'-oxybis(1-Chloropropane)	5	U
106-44-5	4-Methylphenol	5	U
621-64-7	N-Nitroso-di-n-propylamine	5	U
67-72-1	Hexachloroethane	5	U
98-95-3	Nitrobenzene	5	U
78-59-1	Isophorone	5	U
88-75-5	2-Nitrophenol	5	U
105-67-9	2,4-Dimethylphenol	5	U
111-91-1	bis(2-Chloroethoxy)methane	5	U
120-83-2	2,4-Dichlorophenol	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
91-20-3	Naphthalene	5	U
106-47-8	4-Chloroaniline	5	U
87-68-3	Hexachlorobutadiene	5	U
59-50-7	4-Chloro-3-Methylphenol	5	U
91-57-6	2-Methylnaphthalene	5	U
77-47-4	Hexachlorocyclopentadiene	5	U
88-06-2	2,4,6-Trichlorophenol	5	U
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	5	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	5	U
208-96-8	Acenaphthylene	5	U
606-20-2	2,6-Dinitrotoluene	5	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	5	U
51-28-5	2,4-Dinitrophenol	20	U

AR310350

1LCC

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKU2

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: SBLKU2 Date Received: / /

Lab File ID: RB1002U2S.D Date Extracted:10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(UL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

CAS NO.	COMPOUND	CONCENTRATION (ug/L)	Q
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	5	U
121-14-2	2,4-Dinitrotoluene	5	U
84-66-2	Diethylphthalate	5	U
7005-72-3	4-Chlorophenyl-phenylether	5	U
86-73-7	Fluorene	5	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-nitrosodiphenylamine (1)	5	U
101-55-3	4-Bromophenyl-phenylether	5	U
118-74-1	Hexachlorobenzene	5	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	5	U
120-12-7	Anthracene	5	U
84-74-2	Di-n-butylphthalate	5	U
206-44-0	Fluoranthene	5	U
129-00-0	Pyrene	5	U
85-68-7	Butylbenzylphthalate	5	U
91-94-1	3,3'-Dichlorobenzidine	5	U
56-55-3	Benzo(a)anthracene	5	U
218-01-9	Chrysene	5	U
117-81-7	bis(2-Ethylhexyl)phthalate	3	J
117-84-0	Di-n-octylphthalate	5	U
205-99-2	Benzo(b)fluoranthene	5	U
207-08-9	Benzo(k)fluoranthene	5	U
50-32-8	Benzo(a)pyrene	5	U
193-39-5	Indeno(1,2,3-cd)pyrene	5	U
53-70-3	Dibenz(a,h)anthracene	5	U
191-24-2	Benzo(g,h,i)perylene	5	U

(1) - Cannot be separated from Diphenylamine

AR310351

1LCF

LOW CONC. WATER SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKU2

Lab Name: AQUATEC, INC. Contract: 92129

Lab Code: AQUAI Case No.: 92129 SAS No.: SDG No.: 54014

Lab Sample ID: SBLKU2 Date Received: / /

Lab File ID: RB1002U2S.D Date Extracted:10/02/95

Sample Volume: 1000 Date Analyzed: 10/26/95

Concentrated Extract Volume: 1000(uL) Dilution Factor: 1.0

Injection Volume: 1.0(uL) pH:

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC. (ug/L)	Q
1.				
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Lockheed

Environmental Services Assistance Teams
Region 3
1419 Forest Drive, Suite 104
Annapolis, Maryland 21403

Phone: (410) 268-7705
Fax: (410) 268-8472

DATE: DECEMBER 1, 1995

SUBJECT: INORGANIC DATA VALIDATION
SITE: KOPPERS CO. FAC. PLANT (NON-CLP) PROJECT 92129

FROM: BEHROOZ KHOSHKHOO
INORGANIC DATA REVIEWER

MAHBOOBEH MECANIC
SENIOR OVERSIGHT CHEMIST

TO: CYNTHIA E. CAPORALE
ESAT REGIONAL PROJECT OFFICER

THROUGH: DALE S. BOSHART
ESAT TEAM MANAGER

OVERVIEW

Project 92129 (SDG 54014) consisted of two (2) unfiltered aqueous samples and their filtered aliquots analyzed for metals by Inchcape Testing Services Aquatec Laboratories (INCHVT) as a non-Contract Laboratory Program (non-CLP) project according to the Statement of Work (SOW) ILM02.1.

SUMMARY

All analytes were successfully analyzed for all samples.

Areas of concern with respect to data usability are listed below, according to the seriousness of the problem.

MINOR ISSUES

The preparation blank (PB) had reported results greater than the Instrument Detection Limits (IDLs) for the aluminum (Al), chromium (Cr), iron (Fe) and mercury (Hg) analytes. The reported results for these analytes in the affected samples which are less than five times the blank concentrations may be biased high and have been qualified "B".

The ICP serial dilution results were outside the control limit for the zinc (Zn) analyte. The reported results for this analyte are estimated and have been qualified "J".

The Contract Required Detection Limit (CRDL) standard recovery was high for the lead (Pb) analyte. The positive results for this analyte in the affected samples which are less than 2X CRDL may be biased high and have been qualified "K".

NOTES

The arsenic (As), Pb, selenium (Se) and thallium (Tl) analytes were analyzed using the ICP method and had IDL values less than the CRDLs.

100 milliliters (ml) of samples were digested and brought to a final volume of 50 ml, resulting in a dilution factor of 0.5X. The concentrations reported by the laboratory on the Form Is are adjusted to account for the dilution factor. The dilution factor reported on the Data Summary Form (DSF) is to adjust the CRDLs for this variance.

The concentrations of the filtered samples were less than or equal to the unfiltered aliquots (within the laboratory duplicate control limits) except for the calcium (Ca), Fe and manganese (Mn) analytes. Iron and manganese were significantly higher in the filtered samples, contamination is suspected for these analytes. The results for these analytes are listed below.

Analytes	Unfiltered Sample & Conc. (µg/L)	Filtered Sample & Conc. (µg/L)	Difference (µg/L)
	32722	32722F	
Ca	21000	29000	8000
Fe	41.9	22400	22358.1
Mn	20.5	112	91.5
	32723	32723F	
Ca	20500	29200	8700
Fe	45.8	22500	22454.2
Mn	19.6	111	91.4

No matrix spike or duplicate sample analyses were performed for these samples. Potential matrix effects, laboratory precision and accuracy cannot be verified. No documentation was found in the data package waiving the laboratory from performing these QC requirements. Data were not qualified for the lack of these QC analyses, but they should be used with caution.

All data for this non-CLP case were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses, with modifications for use within Region III. The text of the report addresses only those problems affecting usability.

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers added to the results from the laboratory during validation.

ATTACHMENTS

TABLE 1A SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER VALIDATION

TABLE 1B CODES USED IN COMMENTS COLUMN

TABLE 2 GLOSSARY OF DATA QUALIFIER CODES

TABLE 3 DATA SUMMARY FORM

APPENDIX A RESULTS REPORTED BY LABORATORY FORM Is

APPENDIX B SUPPORT DOCUMENTATION

DCN: BK95113A.IM2

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY FORM AFTER DATA VALIDATION

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
Al	All samples	B		HIGH	PB (6.8 µg/L)
Cr	32723, 32723F	B		HIGH	PB (0.3 µg/L)
Fe	32722, 32723	B		HIGH	PB (10.6 µg/L)
Pb	32722, 32723	K		HIGH	CRH (120%)
Hg	All samples	B		HIGH	PB (0.03 µg/L)
Zn	All samples	J			SD (37.3%)

* See explanation of Comments on Table 1B.

TABLE 1B
CODES USED IN COMMENTS COLUMN

PB = The preparation blank had a result > IDL (the result is in parenthesis). The reported results which are < 5x the blank concentration may be biased high.

CRH = The CRDL standard recovery was high (>110%) [%recovery is in parenthesis]. The reported result which is <2x CRDL may be biased high.

SD = The ICP serial dilution results were outside the control limit (10% D) [% D is in parenthesis]. The reported results are estimated.

TABLE 2

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION
(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

DATA SUMMARY FORM: I N O R G A N I C S

TABLE 3

WATER SAMPLES

(ug/L)

Site Name: KOPPERS COUNTY FAC. PLANT

Case #: 92129 Sampling Date(s): 9/18/95

+ Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

	Sample No.	32722		32722F		32723		32723F											
	Dilution Factor	0.5		0.5		0.5		0.5											
	Location	95-KNDRW8-QA		95-KNDRW8-QA		95-KNDRW22-QA		95-KNDRW22-QA											
		SAMPLE UNFILTERED OF 32722F		SAMPLE FILTERED OF 32722		SAMPLE UNFILTERED OF 32723F		SAMPLE FILTERED OF 32723											
CRDL	ANALYTE																		
200	Aluminum	[8.5]	B	[13.5]	B	[16.5]	B	[7.4]	B										
60	Antimony			[15.7]				[3.6]											
10	*Arsenic																		
200	Barium	[74.9]		127		[73.3]		126											
5	Beryllium																		
5	*Cadmium																		
5000	Calcium	21000		29000		20500		29200											
10	*Chromium					[0.47]	B	[0.37]	B										
50	Cobalt	[4.6]				[4.8]													
25	Copper	36.9		[7.6]		35.4		[6.0]											
100	Iron	[41.9]	B	22400		[45.8]	B	22500											
3	*Lead	2.2	K			1.6	K												
5000	Magnesium	16900		17600		16500		17900											
15	Manganese	20.5		112		19.6		111											
0.2	Mercury	[0.05]	B	[0.06]	B	[0.04]	B	[0.03]	B										
40	*Nickel	[8.3]		[5.4]		[8.5]		[6.5]											
5000	Potassium	3450		3530		3380		3620											
5	Selenium																		
10	Silver																		
5000	Sodium	20100		18200		19700		18500											
10	Thallium																		
50	Vanadium			[1.0]		[0.60]		[1.1]											
20	Zinc	75.4	J	14.1	J	73.6	J	11.3	J										
10	*Cyanide		Q		Q		Q		Q										

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 07/90

AR310359

APPENDIX A

RESULTS REPORTED BY LABORATORY

FORM Is

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

32722

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.: 54014_

Matrix (soil/water): WATER Lab Sample ID: 272308

Level (low/med): LOW__ Date Received: 09/27/95

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	8.5	B		P_
7440-36-0	Antimony_	1.1	U		P_
7440-38-2	Arsenic__	1.0	U		P_
7440-39-3	Barium__	74.9	B		P_
7440-41-7	Beryllium	0.10	U		P_
7440-43-9	Cadmium__	0.15	U		P_
7440-70-2	Calcium__	21000			P_
7440-47-3	Chromium_	0.25	U		P_
7440-48-4	Cobalt__	4.6	B		P_
7440-50-8	Copper__	36.9			P_
7439-89-6	Iron_____	41.9	B		P_
7439-92-1	Lead____	2.2			P_
7439-95-4	Magnesium	16900			P_
7439-96-5	Manganese	20.5			P_
7439-97-6	Mercury__	0.05	B		CV
7440-02-0	Nickel__	8.3	B		P_
7440-09-7	Potassium	3450			P_
7782-49-2	Selenium_	1.8	U		P_
7440-22-4	Silver__	0.40	U		P_
7440-23-5	Sodium__	20100			P_
7440-28-0	Thallium_	1.5	U		P_
7440-62-2	Vanadium_	0.55	U		P_
7440-66-6	Zinc____	75.4		E	P_
	Cyanide__				NR

Color Before; COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

32722F

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.: 54014_

Matrix (soil/water): WATER Lab Sample ID: 272309

Level (low/med): LOW__ Date Received: 09/27/95

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	13.5	B		P_
7440-36-0	Antimony_	15.7	B		P_
7440-38-2	Arsenic__	1.0	U		P_
7440-39-3	Barium__	127			P_
7440-41-7	Beryllium	0.10	U		P_
7440-43-9	Cadmium__	0.15	U		P_
7440-70-2	Calcium__	29000			P_
7440-47-3	Chromium_	0.25	U		P_
7440-48-4	Cobalt___	0.50	U		P_
7440-50-8	Copper___	7.6	B		P_
7439-89-6	Iron____	22400			P_
7439-92-1	Lead____	0.75	U		P_
7439-95-4	Magnesium	17600			P_
7439-96-5	Manganese	112			P_
7439-97-6	Mercury__	0.06	B		CV
7440-02-0	Nickel___	5.4	B		P_
7440-09-7	Potassium	3530			P_
7782-49-2	Selenium_	1.8	U		P_
7440-22-4	Silver___	0.40	U		P_
7440-23-5	Sodium___	18200			P_
7440-28-0	Thallium_	1.5	U		P_
7440-62-2	Vanadium_	1.0	B		P_
7440-66-6	Zinc____	14.1		E	P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

AR310362

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

32723F

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.: 54014_

Matrix (soil/water): WATER Lab Sample ID: 272311

Level (low/med): LOW__ Date Received: 09/27/95

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	7.4	B		P_
7440-36-0	Antimony_	3.6	B		P_
7440-38-2	Arsenic__	1.0	U		P_
7440-39-3	Barium__	126			P_
7440-41-7	Beryllium	0.10	U		P_
7440-43-9	Cadmium__	0.15	U		P_
7440-70-2	Calcium__	29200			P_
7440-47-3	Chromium_	0.37	B		P_
7440-48-4	Cobalt___	0.50	U		P_
7440-50-8	Copper___	6.0	B		P_
7439-89-6	Iron____	22500			P_
7439-92-1	Lead____	0.75	U		P_
7439-95-4	Magnesium	17900			P_
7439-96-5	Manganese	111			P_
7439-97-6	Mercury__	0.03	B		CV
7440-02-0	Nickel___	6.5	B		P_
7440-09-7	Potassium	3620			P_
7782-49-2	Selenium_	1.8	U		P_
7440-22-4	Silver___	0.40	U		P_
7440-23-5	Sodium___	18500			P_
7440-28-0	Thallium_	1.5	U		P_
7440-62-2	Vanadium_	1.1	B		P_
7440-66-6	Zinc____	11.3		E	P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

32723

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.: 54014_

Matrix (soil/water): WATER Lab Sample ID: 272310

Level (low/med): LOW__ Date Received: 09/27/95

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	16.5	B		P
7440-36-0	Antimony_	1.1	U		P
7440-38-2	Arsenic__	1.0	U		P
7440-39-3	Barium___	73.3	B		P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium__	0.15	U		P
7440-70-2	Calcium__	20500			P
7440-47-3	Chromium_	0.47	B		P
7440-48-4	Cobalt___	4.8	B		P
7440-50-8	Copper___	35.4			P
7439-89-6	Iron____	45.8	B		P
7439-92-1	Lead____	1.6			P
7439-95-4	Magnesium	16500			P
7439-96-5	Manganese	19.6			P
7439-97-6	Mercury__	0.04	B		CV
7440-02-0	Nickel___	8.5	B		P
7440-09-7	Potassium	3380			P
7782-49-2	Selenium_	1.8	U		P
7440-22-4	Silver___	0.40	U		P
7440-23-5	Sodium___	19700			P
7440-28-0	Thallium_	1.5	U		P
7440-62-2	Vanadium_	0.60	B		P
7440-66-6	Zinc____	73.6		E	P
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

APPENDIX B

SUPPORT DOCUMENTATION

U.S. ARMY CORPS OF ENGINEERS

CHAIN OF CUSTODY RECORD 95-315 and Call #33

AR310366

PROJ. NO.	PROJECT NAME KOPPERS
SAMPLERS: (Signature) OTHERS	

ENV # ~~STA. NO.~~	DATE 1995	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TCL VOC, USEPA CLP	TCL, BNA, USEPA CLP	TOTAL TAL METALS USEPA CLP	DISSOLVED TAL METALS USEPA			REMARKS
32721	9-18	1320			95-KNDRW8-TB	2	X						KOPPERS - WATER
32722	9-18	1320			95-KNDRW8-QA	9	X	X	X	X			
32723	9-18	1330			95-KNDRW22-QA	9	X	X	X	X			

NOTE: ACHIEVE LOWEST POSSIBLE DETECTION LIMIT FOR PENTACHLOROPHENOL - SEE S. SWANBORN

ADDITIONALLY, THE ANALYSES LISTED ABOVE ARE ALL FOR LOW LEVEL CLP ANALYSIS.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9-26-95 1500	UPS NEXT DAY AIR 0698 9132 805-841			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature]	9/27/95 1000	Samples sent to Aquatec	

Distribution: Original Accompanies Shipment; Copy 1 to Sample Custodian; Copy 2 to Coordinator Field Files

QUALIFIERS FOR METALS ANALYSIS

E (Fur) - Analytical cup spike recovery is less than 40%. An explanatory note is included on the specific form to which this applies.

E (ICP) - The reported value is estimated because of the presence of interference.

M - Duplicate injection precision not met.

N - Matrix spiked sample recovery not within control limits.

S - The reported value was determined by the Method of Standard Additions.

+ - Correlation coefficient for the MSA is less than 0.995.

W - Post digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample concentration is less than 50% of spike concentration.

* - Duplicate analysis not within control limits.

Concentration Qualifiers

B - Entered if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL).

U - Entered if the analyte was analyzed for but not detected, less than IDL.

Method Qualifiers

P - for ICP
F - for Furnace AA
CV - for Manual Cold Vapor AA
AS - for Semi-automated Spectrophotometric
NR - if the analyte is not required to be analyzed

Sample Calculations

$$\text{waters digestate concentration} \left(\frac{\mu g}{L}\right) \times \frac{\text{final digestate volume (L)}}{\text{amount of sample digested (g)}} \times \frac{\text{density* (1 g)}}{\text{(1 mL)}} \times \text{dilution factor} \times \frac{1000\ \text{ml}}{1\ \text{L}} = \text{ug/L}$$

$$\text{soils digestate concentration} \left(\frac{\mu g}{L}\right) \times \frac{\text{final digestate volume (L)}}{\text{amount of sample digested (g)}} \times \frac{100}{\%\ \text{solids}} \times \text{dilution factor} = \text{mg/Kg dry weight}$$

* For the purposes of calculation, water samples are assumed to have a density of 1 g/mL.

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129 SAS No.: _____ SDG No.:54014_

SOW No.: ILM02.1

EPA Sample No.	Lab Sample ID
_32722_____	_272308_____
_32722F_____	_272309_____
_32723_____	_272310_____
_32723F_____	_272311_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Joseph Orsini Name: Joseph Orsini

Date: 10-24-95 Title: Assistant Lab Director

AR310368

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2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.: 54014_

AA CRDL Standard Source: VENTURES____

ICP CRDL Standard Source: VENTURES____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony				120.0	119.50	99.6	118.40	98.7
Arsenic				20.0	21.08	105.4	19.43	97.2
Barium								
Beryllium				10.0	10.34	103.4	10.34	103.4
Cadmium				10.0	10.15	101.5	10.15	101.5
Calcium								
Chromium				20.0	21.25	106.2	20.89	104.4
Cobalt				100.0	99.49	99.5	99.10	99.1
Copper				50.0	50.12	100.2	49.58	99.2
Iron								
Lead				6.0	7.20	120.0	5.97	99.5
Magnesium								
Manganese				30.0	30.33	101.1	30.18	100.6
Mercury	0.2	0.21	105.0					
Nickel				80.0	79.42	99.3	78.73	98.4
Potassium								
Selenium				10.0	10.71	107.1	10.66	106.6
Silver				20.0	20.87	104.4	19.88	99.4
Sodium								
Thallium				20.0	21.94	109.7	20.70	103.5
Vanadium				100.0	103.20	103.2	102.30	102.3
Zinc				40.0	41.32	103.3	41.01	102.5

AR310369

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3
BLANKS

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.: 54014_

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	9.9	U	9.9	U	9.9	U			6.801	B	P
Antimony	2.2	U	2.2	U	2.2	U			1.098	U	
Arsenic	2.1	U	2.1	U	2.1	U			1.048	U	
Barium	3.4	U	3.4	U	3.4	U			1.696	U	
Beryllium	0.2	U	0.2	U	0.2	U			0.100	U	P
Cadmium	0.3	U	0.3	U	0.3	U			0.150	U	P
Calcium	87.0	U	87.0	U	87.0	U			43.409	U	P
Chromium	0.5	U	0.5	U	0.5	U			0.315	B	P
Cobalt	1.0	U	1.0	U	1.0	U			0.499	U	P
Copper	0.7	U	0.7	U	0.7	U			0.349	U	P
Iron	18.5	U	18.5	U	18.5	U			10.568	B	P
Lead	1.5	U	1.5	U	1.5	U			0.748	U	P
Magnesium	92.5	U	92.5	U	92.5	U			46.153	U	P
Manganese	0.4	U	0.4	U	0.4	U			0.200	U	P
Mercury	0.0	U	0.0	U	0.0	B	0.0	U	0.026	B	CV
Nickel	1.0	U	1.0	U	1.0	U			0.499	U	P
Potassium	105.2	U	105.2	U	105.2	U			52.490	U	P
Selenium	3.7	U	3.7	U	3.7	U			1.846	U	P
Silver	0.8	U	0.8	U	0.8	U			0.399	U	P
Sodium	200.2	U	200.2	U	200.2	U			99.890	U	P
Thallium	3.0	U	3.0	U	3.0	U			1.497	U	P
Vanadium	1.1	U	1.1	U	1.1	U			0.549	U	P
Zinc	0.4	U	0.4	U	0.4	U			0.259	B	P
Cyanide											NR

AR310370

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9

ICP SERIAL DILUTION

EPA SAMPLE NO.

32723FL

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.: 54014_

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	14.89	B	49.50	U	100.0		P
Antimony	7.28	B	11.00	U	100.0		P
Arsenic	2.10	U	10.50	U			P
Barium	252.50		254.50	B	0.8		P
Beryllium	0.20	U	1.00	U			P
Cadmium	0.30	U	1.50	U			P
Calcium	58620.00		60670.00		3.5		P
Chromium	0.75	B	2.50	U	100.0		P
Cobalt	1.00	U	5.00	U			P
Copper	11.95	B	12.31	B	3.0		P
Iron	45130.00		46540.00		3.1		P
Lead	1.50	U	7.50	U			P
Magnesium	35890.00		36680.00		2.2		P
Manganese	222.50		228.40		2.7		P
Mercury							NR
Nickel	12.97	B	15.12	B	16.6		P
Potassium	7261.00		7517.00	B	3.5		P
Selenium	3.70	U	18.50	U			P
Silver	0.80	U	4.00	U			P
Sodium	37110.00		36390.00		1.9		P
Thallium	3.00	U	15.00	U			P
Vanadium	2.29	B	5.50	U	100.0		P
Zinc	22.73		31.21	B	37.3	E	P

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10

Instrument Detection Limits (Quarterly)

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.: 54014_

ICP ID Number: ICP_TJA_61E_ Date: 10/01/95

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.22		200	9.9	P
Antimony	206.84		60	2.2	P
Arsenic	189.04		10	2.1	P
Barium	493.41		200	3.4	P
Beryllium	313.04		5	0.2	P
Cadmium	226.50		5	0.3	P
Calcium	317.93		5000	87.0	P
Chromium	267.72		10	0.5	P
Cobalt	228.62		50	1.0	P
Copper	324.75		25	0.7	P
Iron	271.44		100	18.5	P
Lead	220.35		3	1.5	P
Magnesium	279.08		5000	92.5	P
Manganese	257.61		15	0.4	P
Mercury			0.2		NR
Nickel	231.60		40	1.0	P
Potassium	766.49		5000	105.2	P
Selenium	196.03		5	3.7	P
Silver	328.07		10	0.8	P
Sodium	330.23		5000	200.2	P
Thallium	190.86		10	3.0	P
Vanadium	292.40		50	1.1	P
Zinc	213.86		20	0.4	P

Comments:

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ANALYSIS RUN LOG

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.: 92129_ SAS No.: _____ SDG No.:54014_

Instrument ID Number: ICP TJA 61E__ Method: P_

Start Date: 10/13/95 End Date: 10/13/95

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	C N
S0	1.00	1829		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
S8	1.00	1834		-	X	X				-				-	X	-		-		-	X		-	X			-
S4	1.00	1838			-	-	X	X	X		X	X	X	-	-	-	X	-	X	-	-	X	-	-	X	X	-
S7	1.00	1842		X	-	-				X				X	-	X		-		X	-		X	-			-
ICV	1.00	1850		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
ICB	1.00	1854		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
ICSA	1.00	1859		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
ICSAB	1.00	1904		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
CRI	1.00	1909			X	X		X	X		X	X	X		X		X	-	X		X	X		X	X	X	-
CCV	1.00	1913		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
CCB	1.00	1918		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
PBW1	1.00	1923		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
LCSW1	1.00	1927		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
32722	1.00	1932		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
32722F	1.00	1936		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
32723	1.00	1941		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
32723F	1.00	1946		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
32723FL	5.00	1950		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
ICSA	1.00	1955		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
ICSAB	1.00	2000		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
CRI	1.00	2004			X	X		X	X		X	X	X		X		X	-	X		X	X		X	X	X	-
CCV	1.00	2009		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
CCB	1.00	2014		X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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U.S. EPA - CLP

13
PREPARATION LOG

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 92129_____

Lab Code: INCHVT Case No.:_92129_ SAS No.: _____ SDG No.:54014_

Method: P_

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
32722	10/11/95		50
32722F	10/11/95		50
32723	10/11/95		50
32723F	10/11/95		50
LCSW1	10/11/95		100
PBW1	10/11/95		50

AR310374

Aquatec, Inc. --- PREP BENCHSHEET --- 11-OCT-1995 20:36:33 --- FPC

Prep Method: ILM02:IW Analyst: [illegible] Batch: GG

Solid/Water (S/W): W Prep Date (mm-dd-yy): 10/11/95

COIC 2.-1

Lab ID	Digested Mass (g)	Digestate Volume (ml)	Spike Fraction	Spike ID
PB600	100.21	~~100~~ 50		
~~272305~~ LCSWIF	100.00	100		
272308	100.46	50		
272309	100.39			
272310	100.09			
272311	100.26			

DEPARm 54014

AR310375

Lockheed
Environmental Services Assistance Teams
Region 3
1419 Forest Drive, Suite 104
Annapolis, Maryland 21403

Phone: (410) 268-7705
Fax: (410) 268-8472

DATE: November 30, 1995

SUBJECT: Dioxin/Furan Data Validation For Project 951460
Site: Koopers Co. Fac. Plant

FROM: Mahboobeh Mecanic MM
Senior Oversight Chemist

Mahmoud Hamid MOH
Senior Oversight Chemist

TO: Cynthia E. Caporale
ESAT Regional Project Officer

THROUGH: Dale S. Boshart DSB
ESAT Team Manager

OVERVIEW

Two (2) aqueous samples collected on 9/11/95 were analyzed by Pace Indianapolis (IN049) for total tetra through octa chlorinated dibenzo-p-dioxins and dibenzofurans on 9/22/95. The samples were analyzed as a Non-Contract Laboratory Program (Non-CLP) utilizing Statement of Work (SOW) DFLM01.1.

A Laboratory Control Spike (LCS)/LCS Duplicate (LCSD) and a Method Blank (MB) were prepared and analyzed as the Quality Control (QC) measures for these samples. No site specific QC was required.

Both samples were successfully analyzed for all target analytes. No 2,3,7,8-chlorine substituted TCDDs and TCDFs were detected in these samples. The Data Summary Form (DSF) summarizes the Other dioxin/furan isomers (non-2,3,7,8 isomers) detected and their qualifications based on data validation. All sample results are reported in the unit of ng/L.

Analytical Methodology Comments

- Three (3) ions were monitored for the identification of each tetra through octa dioxin and furan. The appropriate diphenylether ion was also monitored for possible interference with the furan identifications.

- The laboratory used a total of five (5) labeled internal standards for quantitation of native dioxins and furans. Two (2) labeled recovery standards and one (1) labeled cleanup standard were used to determine method (extraction and cleanup procedure) efficiencies.

QA/QC Comments

- Other TCDF, at a low concentration, was reported as Estimated Maximum Possible Concentration (EMPC) in the method blank, field samples and LCS/LCSD. The results for this analyte were qualified "B" on the DSF for both field samples.

Notes

- The laboratory provided areas for the quantitations of 2,3,7,8 substituted dioxin and furan isomers, but not for the other isomers. Therefore, the concentrations of the other TCDF in the above samples could not be confirmed by the reviewer. Also, the reason for reporting these results as EMPC is not clear. Since these low concentrations appear to be the result of laboratory contamination and have no health risk exposure significance, no action was taken.

- The LCS had the recoveries of four native analytes (12378-PeCDF, 1234678-HpCDF, OCDD and OCDF) outside the upper QC limits and the LCSD had the recovery of 12378-PeCDF above the QC limit. Since no positive results were detected, no action was taken.

- A non-spiked analyte, 123789-HxCDD, was detected in LCS and LCSD at concentrations below the Contract Required Quantitation Limit.

- A sample volume of 1070 milliliters (mL) instead of 1000 mL was used for the extraction of sample 32686. The dilution factor was adjusted on the DSF.

- The data package was not paginated by the laboratory.

Attachment

1) Appendix A - Laboratory Control Sample Summary
2) Appendix B - Glossary of Data Qualifier Codes (Dioxin/Furan)
3) Appendix C - Data Summary Forms. Toxicity Equivalent (TEQ)
4) Appendix D - Results as reported by the laboratory
5) Appendix E - Support Documentation

Appendix A

Laboratory Control Sample Summary

3DFA
PCDD/PCDF SPIKED SAMPLE SUMMARY

EPA SAMPLE NO.

LCS

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No.:

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

ANALYTE	SPIKE ADDED (PG)	SPIKED SAMPLE CONCENTRATION	SAMPLE CONCENTRATION	% REC	#	QC LIMITS
2378-TCDD	25000	31.54	0.00	126.2		50-150
2378-TCDF	25000	33.19	0.00	132.8		50-150
12378-PeCDF	62500	95.80	0.00	153.3	*	50-150
12378-PeCDD	62500	80.72	0.00	129.2		50-150
123678-HxCDF	62500	93.46	0.00	149.5		50-150
123678-HxCDD	62500	93.74	0.00	150.0		50 150
1234678-HpCDF	62500	95.64	0.00	153.0	*	50-150
1234678-HpCDD	62500	73.85	0.00	118.2		50-150
OCDD	125000	204.10	0.00	163.3	*	50-150
OCDF	125000	200.22	0.00	160.2	*	50-150

If an analyte is not detected in the unspiked sample, enter 0 (zero) as the "SAMPLE CONCENTRATION".

Column to be used to flag values outside QC limits.

QC limits are advisory.

3DFC
PCDD/PCDF SPIKED DUPLICATE SUMMARY

EPA SAMPLE NO.

LCSD

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SAS No.:

Matrix: WATER (Soil/Water/Waste/Ash) SDG No.:

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

ANALYTE	SAMPLE CONCENTRATION	DUPLICATE CONCENTRATION	RPD	#	QC LIMITS
2378-TCDD	31.54	30.56	3.2		50
2378-TCDF	33.19	31.90	4.0		50
12378-PeCDF	95.80	97.56	1.8		50
12378-PeCDD	80.72	86.40	6.8		50
123678-HxCDF	93.46	88.49	5.5		50
123678-HxCDD	93.74	81.95	13.4		50
1234678-HpCDF	95.64	81.01	16.6		50
1234678-HpCDD	73.85	68.62	7.4		50
OCDD	204.10	165.74	20.7		50
OCDF	200.22	164.40	19.6		50

If an analyte is not detected in either analysis, enter 0 (zero) as the concentration.

Column to be used to flag values outside QC limits.

QC limits are advisory.

Appendix B

Glossary of Data Qualifier Codes (Dioxin/Furan)

GLOSSARY OF DATA QUALIFIER CODES
(DIOXIN/FURAN)

B	Blank Contamination
I	Polychlorinated diphenyl ether (PCDPE) interferences
J	The analyte was positively identified; the associated numerical value is the estimated concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	Not detected above the Contract Required Quantitation Limit (CRQL).
UJ	Not detected, quantitation limit is estimated.

Appendix C

Data Summary Form

DATA SUMMARY FORM: PCDDs & PCDFs

Case #: 951460
Site Name: Koopers Co. Fac. Plant

Water Samples (ng/L)

Lab Name: Pace-Indianapolis

Sample No.	32685			32686								
Dilution Factor	1			0.93								
Location	32685			32686								
ANALYTE / TEF	CONC	TEQ	Q	CONC	TEQ	Q	CONC	TEQ	Q	CONC	TEQ	Q
2378-TCDF (0.10)		0.000			0.000			0.000			0.000	
2378-TCDD (1.00)		0.000			0.000			0.000			0.000	
12378-PeCDF (0.05)		0.000			0.000			0.000			0.000	
23478-PeCDF (0.50)		0.000			0.000			0.000			0.000	
12378-PeCDD (0.50)		0.000			0.000			0.000			0.000	
123478-HxCDF (0.10)		0.000			0.000			0.000			0.000	
123678-HxCDF (0.10)		0.000			0.000			0.000			0.000	
234678-HxCDF (0.10)		0.000			0.000			0.000			0.000	
123789-HxCDF (0.10)		0.000			0.000			0.000			0.000	
123478-HxCDD (0.10)		0.000			0.000			0.000			0.000	
123678-HxCDD (0.10)		0.000			0.000			0.000			0.000	
123789-HxCDD (0.10)		0.000			0.000			0.000			0.000	
1234678-HpCDF (0.01)		0.000			0.000			0.000			0.000	
1234789-HpCDF (0.01)		0.000			0.000			0.000			0.000	
1234678-HpCDD (0.01)		0.000			0.000			0.000			0.000	
OCDF (0.001)		0.000			0.000			0.000			0.000	
OCDD (0.001)		0.000			0.000			0.000			0.000	
Other TCDF	0.54	0.000	B	1.01	0.000	B		0.000			0.000	
Other TCDD		0.000			0.000			0.000			0.000	
Other PeCDF		0.000			0.000			0.000			0.000	
Other PeCDD		0.000			0.000			0.000			0.000	
Other HxCDF		0.000			0.000			0.000			0.000	
Other HxCDD		0.000			0.000			0.000			0.000	
Other HpCDF		0.000			0.000			0.000			0.000	
Other HpCDD		0.000			0.000			0.000			0.000	
TOTAL TEQ		0.000			0.000			0.000			0.000	

TEQs are based on I-TEF/89 Scheme.

Appendix D

Results as reported by the laboratory

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.
32685

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: IL1627 SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: IL1627-1

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0601007.D

Concentrated Extract Volume: 50 (uL) Date Received: 09/20/95

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322					U	0.1406
2378-TCDF	304/306					U	0.1131
12378-PeCDF	340/342					U	0.0922
12378-PeCDD	356/358					U	0.1963
23478-PeCDF	340/342					U	0.0892
123478-HxCDF	374/376					U	0.1331
123678-HxCDF	374/376					U	0.1216
123478-HxCDD	390/392					U	0.1794
123678-HxCDD	390/392					U	0.1797
123789-HxCDD	390/392					U	0.1655
234678-HxCDF	374/376					U	0.1374
123789-HxCDF	374/376					U	0.1443
1234678-HpCDF	408/410					U	0.1378
1234678-HpCDD	424/426					U	0.1390
1234789-HpCDF	408/410					U	0.1506
OCDD	458/460					U	0.5532
OCDF	442/444					U	0.4114

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	#	RECOVERY LIMITS
13C-2378-TCDF	316/318	19.40	0.73		0.65-0.89	54.5		25-150
13C-2378-TCDD	332/334	20.00	0.72		0.65-0.89	51.7		25-150
13C-123678-HxCDD	402/404	29.75	1.21		1.05-1.43	75.4		25-150
13C-1234678-HpCDF	420/422	33.93	1.07		0.88-1.20	67.6		25-150
13C-OCDD	470/472	42.24	0.93		0.76-1.01	41.3		25-150
37Cl-2378-TCDD	328/NA	20.02	NA		NA	52.9		25-150

Column to be used to flag values outside QC limits.

2DF

PCDD/PCDF TOTAL HOMOLOGUE CONCENTRATION SUMMARY

EPA SAMPLE NO.

32685

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: IL1627 SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: IL1627-1

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0601007.D

Concentrated Extract Volume: 50 (uL) Date Received: 09/20/95

Injection Volume: 2 uL % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

HOMOLOGUE	PEAKS	CONCENTRATION	Q	EMPC/EDL
DIOXINS				
Total TCDD			U	0.1406
Total PeCDD			U	0.1963
Total HxCDD			U	0.1655
Total HpCDD			U	0.1390
FURANS				
Total TCDF	1			0.5398
Total PeCDF			U	0.0892
Total HxCDF			U	0.1216
Total HpCDF			U	0.1378

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis. The total congener concentrations do not affect the TEF calculations.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.
32686

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: IL1627 SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1070 (g/mL) mL Lab Sample ID: IL1627-2

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0701008.D

Concentrated Extract Volume: 50 (uL) Date Received: 09/20/95

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322					U	0.1769
2378-TCDF	304/306					U	0.1742
12378-PeCDF	340/342					U	0.1487
12378-PeCDD	356/358					U	0.2544
23478-PeCDF	340/342					U	0.1439
123478-HxCDF	374/376					U	0.1110
123678-HxCDF	374/376					U	0.1014
123478-HxCDD	390/392					U	0.1365
123678-HxCDD	390/392					U	0.1367
123789-HxCDD	390/392					U	0.1259
234678-HxCDF	374/376					U	0.1145
123789-HxCDF	374/376					U	0.1203
1234678-HpCDF	408/410					U	0.1778
1234678-HpCDD	424/426					U	0.1280
1234789-HpCDF	408/410					U	0.1943
OCDD	458/460					U	0.3538
OCDF	442/444					U	0.3133

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	#	RECOVERY LIMITS
13C-2378-TCDF	316/318	19.40	0.73		0.65-0.89	28.0		25-150
13C-2378-TCDD	332/334	20.00	0.73		0.65-0.89	30.3		25-150
13C-123678-HxCDD	402/404	29.75	1.21		1.05-1.43	60.1		25-150
13C-1234678-HpCDF	420/422	33.93	1.08		0.88-1.20	57.9		25-150
13C-OCDD	470/472	42.24	0.94		0.76-1.01	40.3		25-150
37Cl-2378-TCDD	328/NA	20.02	NA		NA	33.4		25-150

Column to be used to flag values outside QC limits.

2DF

PCDD/PCDF TOTAL HOMOLOGUE CONCENTRATION SUMMARY

EPA SAMPLE NO.

32686

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: IL1627 SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1070 (g/mL) mL Lab Sample ID: IL1627-2

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0701008.D

Concentrated Extract Volume: 50 (uL) Date Received: 09/20/95

Injection Volume: 2 uL % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

HOMOLOGUE	PEAKS	CONCENTRATION	Q	EMPC/EDL
DIOXINS				
Total TCDD			U	0.1769
Total PeCDD			U	0.2544
Total HxCDD			U	0.1259
Total HpCDD			U	0.1280
FURANS				
Total TCDF	1			1.0108
Total PeCDF			U	0.1439
Total HxCDF			U	0.1014
Total HpCDF			U	0.1778

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.
The total congener concentrations do not affect the TEF calculations.

Appendix E

Support Documentation

pace INCORPORATED
ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

October 12, 1995

Mr. John O'Donnel
EA Laboratories
19 Loveton Circle
Sparks, MD 21152

Dear Mr. O'Donnel,

Enclosed are the analytical results for the analysis of two water samples for PCDD/PCDF. These samples were analyzed according to the current Statement of Work DFLM01.1 (Modified 8280) by Low Resolution GC/High Resolution MS as described in the following narrative.

These samples were received for analysis on September 20, 1995 at 09:30 and identified as case IL1627. One copy of this level 3 report was sent to you via Federal Express standard overnight on October 12, 1995. Duplicate copies can be supplied at your request for a fee of $20.00 per copy.

We have three report packages to choose from. If an upgrade of the original package is requested, an additional charge will be made. You are a valued customer, and quality service to you is our ultimate goal. Please remember, if you have any questions or comments regarding this data or this report, feel free to contact your Project Manager, Mr. Dale Pershing, at (317) 875-5894.

Sincerely,

Janet M. Sachs

Janet M. Sachs
Document Control Officer

Enclosure

7726 Moller Road
Indianapolis, IN 46268
TEL: 317-875-5894

AR310391

An Equal Opportunity Employer

pace INCORPORATED
ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

IL1627

Two water samples for case IL1627 were received on September 20, 1995. These samples were checked for integrity, logged and assigned laboratory identification numbers per the current Standard Operating Procedures (SOP). Any discrepancies noted during these processes have been documented on a Sample Receiving Nonconformance report.

The samples were extracted, prepared and analyzed according to the current Statement of Work for Analysis of PCDD/PCDF (Document Number DFLM01.1). Both samples were found to be non-detect for all analytes. The laboratory control spike had four native recoveries that were over 150% and the laboratory control spike duplicate showed similar results. Because all but two other natives were close to 150%, it is believed that the matrix spiking solution has concentrated. A new spiking solution has been received and the old one has been discarded. This does not affect data validity. No other particular problems were encountered during the analytical process.

If any questions arise concerning this analysis, please contact your Project Manager at 317-875-5894.

QM
10-12-95

7726 Moller Road
Indianapolis, IN 46268
TEL: 317-875-5894
FAX: 317-872-6189

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EA®

LABORATORY: TO ENSURE PAYMENT, keep green copy and return all others with a current Certificate of Insurance and IRS Form W-9 to the Originator Location (send invoices in triplicate to address below):

EA LABORATORIES
17 LOEDEN CIRCLE
SPARKS MD 21152
JOHN ODONNELL 410 771 4920

Date of Order 9/19/95
Delivery Date 10/11/95
Project Manager Approval Guy Lynch
Project Manager Phone #

Laboratory Service Order Agreement # L 006824
EA Client Reference Number _____ Page ___ of ___
Subject to Terms & Conditions printed on back OR
Master Agreement No. _____

Laboratory Name and Address:
PACE INCORPORATED
7726 MOLLER ROAD
INDIANAPOLIS, IN 46268
ATTN: SAMPLE MANAGEMENT
(317) 875-5894

AR310393

CHAIN-OF-CUSTODY RECORD Date	Time	Sample ID/Location No.	Parameters: RDD/PCDF DFLMO 1-8													Sample Cost	Remarks
9/11/95	1520	32685	X													625	EA95I3302 JU1627-1
9/11/95	1650	32686	X		LAST ITEM											625	95I3303 -2
															Total Cost $	1250	

Additional Description of Services: FULL VALIDATABLE PKG (USACE QA SPLITS) NO SITE SPECIFIC QC REQUIRED, BUT CORPS DOES REQUIRE BATCH QC (UNBILLABLE) REPORT # 951460

1. Report due 21 days from date of order.
2. QC Protocols: U.S. EPA Series 600 ___ 500 ___ 200 ___ U.S. EPA CLP ✓
   SW846 ___ Explanations: _____
3. Reporting Deliverables: CLP ✓ Navy ___ USACE ___ NJDEP Tier I ___
   EA Standard Report ___ Other FULL VALIDATABLE PKG + SUMM. TABLES
4. Holding time expiration date.
   Extractions Water ___ Soil ___
   Organic Analysis: VOA Water ___ Soil ___
   Pesticides/PCBs (H2O) ___ Soil ___
   Semivolatiles (H2O) ___ Soil ___
   Metals Analysis: _____ Inorganic Analysis _____
5. Special Conditions Attached _____

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Method of Shipment
Archer	9/19/95	17:00	Julie Tillman	09/20/95	0930	Fedx CS-A Cooler 1.0°C

EA 0607 F&B 9/1/6 White – Corporate Contracts Green – Laboratory Pink – Originator Yellow – Branch Copy

6DFA
PCDD/PCDF INITIAL CALIBRATION RESPONSE FACTOR SUMMARY

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SAS No.: SDG No.:

GC Column: DB-5 ID: 0.25 (mm) Instrument ID: 5971

Init. Calib. Date(s): 10/04/95

Init. Calib. Times: 13:40:00-18:26:00

NATIVE ANALYTES VS. INTERNAL STANDARDS	RRF (N)					MEAN RRF	%RSD
	CC1	CC2	CC3	CC4	CC5		
2378-TCDD	1.0888	1.1024	1.0821	1.0618	1.0336	1.0737	2.50%
2378-TCDF	0.9272	0.9529	0.9278	0.8800	0.8771	0.9130	3.63%
12378-PeCDF	0.9242	0.9830	0.9683	0.9042	0.9077	0.9375	3.84%
12378-PeCDD	0.9619	1.0445	1.0523	0.9937	0.9758	1.0056	4.05%
23478-PeCDF			1.0048			1.0048	
123478-HxCDF			1.0623			1.0623	
123678-HxCDF	1.1792	1.1226	1.1347	1.1223	1.0933	1.1304	2.76%
123478-HxCDD			0.8653			0.8653	
123678-HxCDD	0.8785	0.8820	0.8460	0.8306	0.8310	0.8536	2.95%
123789-HxCDD			0.9354			0.9354	
234678-HxCDF			1.0163			1.0163	
123789-HxCDF			0.9745			0.9745	
1234678-HpCDF	1.1567	1.1766	1.1338	1.0980	1.0728	1.1276	3.75%
1234678-HpCDD	0.9854	0.9674	1.0281	0.9497	0.9491	0.9760	3.35%
1234789-HpCDF			1.0331			1.0331	
OCDD	1.0418	0.9519	1.0168	0.9353	0.9633	0.9818	4.62%
OCDF	1.1905	1.1833	1.2054	1.1747	1.1698	1.1847	1.18%
INTERNAL STANDARDS VS. RECOVERY STDS.							
13C-2378-TCDD	1.1606	1.1947	1.1077	1.0576	1.1652	1.1372	4.78%
13C-2378-TCDF	1.8784	1.8352	1.8116	1.7594	1.8890	1.8347	2.87%
13C-123678-HxCDD	0.9087	0.9556	0.9032	0.9088	0.9296	0.9212	2.36%
13C-1234678-HpCDF	1.1019	1.0995	1.0785	1.0798	1.1246	1.0969	1.72%
13C-OCDD	0.6946	0.6718	0.6987	0.7033	0.7308	0.6998	3.02%
37Cl-2378-TCDD			1.3668			1.3668	

A single point calibration is performed for seven of the native analytes and the cleanup standard. Therefore, no %RSD is reported for these compounds.

QC Limits: %RSD must be less than or equal to 15%.

6DFB

PCDD/PCDF INITIAL CALIBRATION ION ABUNDANCE RATIO SUMMARY

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SAS No.: SDG No.:

GC Column: DB-5 ID: 0.25 (mm) Instrument ID: 5971

Init. Calib. Date(s): 10/04/95

Init. Calib. Times: 13:40:00-18:26:00

NATIVE ANALYTES	SELECT IONS	ION ABUNDANCE RATIO					FLAG	QC LIMITS
		CC1	CC2	CC3	CC4	CC5		
2378-TCDD	320/322	0.73	0.74	0.74	0.74	0.73		0.65-0.89
2378-TCDF	304/306	0.74	0.75	0.75	0.75	0.74		0.65-0.89
12378-PeCDF	340/342	1.54	1.49	1.51	1.48	1.49		1.24-1.86
12378-PeCDD	356/358	1.61	1.51	1.53	1.49	1.50		1.24-1.86
23478-PeCDF	340/342			1.50				1.24-1.86
123478-HxCDF	374/376			1.21				1.05-1.43
123678-HxCDF	374/376	1.24	1.22	1.21	1.22	1.22		1.05-1.43
123478-HxCDD	390/392			1.20				1.05-1.43
123678-HxCDD	390/392	1.22	1.21	1.20	1.21	1.20		1.05-1.43
123789-HxCDD	390/392			1.20				1.05-1.43
234678-HxCDF	374/376			1.21				1.05-1.43
123789-HxCDF	374/376			1.21				1.05-1.43
1234678-HpCDF	408/410	1.00	1.01	1.00	1.01	1.00		0.88-1.20
1234678-HpCDD	424/426	0.99	0.99	0.97	0.98	0.98		0.88-1.20
1234789-HpCDF	408/410			0.98				0.88-1.20
OCDD	458/460	0.83	0.84	0.83	0.83	0.82		0.76-1.02
OCDF	442/444	0.94	0.94	0.93	0.94	0.94		0.76-1.02
INTERNAL STANDARDS								
13C-2378-TCDD	332/334	0.79	0.79	0.79	0.78	0.80		0.65-0.89
13C-2378-TCDF	316/318	0.80	0.82	0.80	0.80	0.81		0.65-0.89
13C-123678-HxCDD	402/404	1.25	1.24	1.25	1.23	1.25		1.05-1.43
13C-1234678-HpCDF	420/422	1.07	1.08	1.07	1.07	1.07		0.88-1.20
13C-OCDD	470/472	0.94	0.93	0.93	0.94	0.96		0.76-1.02
RECOVERY STANDARDS								
13C-1234-TCDD	332/334	0.82	0.82	0.82	0.81	0.83		0.65-0.89
13C-123789-HxCDD	402/404	1.25	1.24	1.24	1.23	1.25		1.05-1.43

QC limits represent +/- 15% window around the theoretical ion abundance ratio.

A single point calibration is performed for seven of the native analytes and the cleanup standard.

The laboratory must flag any analyte in any calibration solution which does not meet the ion abundance ratio QC limit by placing an asterisk in the flag column.

7DFA

PCDD/PCDF CONTINUING CALIBRATION SUMMARY

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SAS No.: SDG No.:

GC Column: DB-5 ID: 0.25 (mm) Instrument ID: 5971

Date Analyzed: 10/09/95 Time Analyzed: 15:32:00

Lab File ID: 0301003.D Init. Calib. Date(s): 10/04/95

NATIVE ANALYTES	SELECT IONS	RRF	MEAN RRF	%D	RRF FLAG	ION RATIO	ION FLAG	QC LIMITS
2378-TCDD	320/322	1.0732	1.0737	0.1		0.75		0.65-0.89
2378-TCDF	304/306	0.9126	0.9130	0.0		0.79		0.65-0.89
12378-PeCDF	340/342	0.9265	0.9375	1.2		1.50		1.24-1.86
12378-PeCDD	356/358	0.9758	1.0056	3.0		1.49		1.24-1.86
23478-PeCDF	340/342	0.9578	1.0048	4.7		1.50		1.24-1.86
123478-HxCDF	374/376	1.0921	1.0623	2.8		1.19		1.05-1.43
123678-HxCDF	374/376	1.1949	1.1304	5.7		1.19		1.05-1.43
123478-HxCDD	390/392	0.8469	0.8653	2.1		1.20		1.05-1.43
123678-HxCDD	390/392	0.8455	0.8536	1.0		1.20		1.05-1.43
123789-HxCDD	390/392	0.9181	0.9354	1.9		1.21		1.05-1.43
234678-HxCDF	374/376	1.0582	1.0163	4.1		1.19		1.05-1.43
123789-HxCDF	374/376	1.0074	0.9745	3.4		1.19		1.05-1.43
1234678-HpCDF	408/410	1.1466	1.1276	1.7		1.00		0.88-1.20
1234678-HpCDD	424/426	0.9980	0.9760	2.3		1.03		0.88-1.20
1234789-HpCDF	408/410	1.0490	1.0331	1.5		0.97		0.88-1.20
OCDD	458/460	1.0073	0.9818	2.6		0.82		0.76-1.02
OCDF	442/444	1.3001	1.1847	9.7		0.83		0.76-1.02
INTERNAL STANDARDS								
VS. RECOVERY STDS.								
13C-2378-TCDD	332/334	1.1392	1.1372	0.2		0.71		0.65-0.89
13C-2378-TCDF	316/318	1.8123	1.8347	1.2		0.74		0.65-0.89
13C-123678-HxCDD	402/404	0.9140	0.9212	0.8		1.19		1.05-1.43
13C-1234678-HpCDF	420/422	1.0284	1.0969	6.2		1.08		0.88-1.20
13C-OCDD	470/472	0.6547	0.6998	6.5		0.93		0.76-1.02
37-Cl-2378-TCDD	328/NA	1.3995	1.3668	2.4		NA	NA	NA
RECOVERY STANDARDS								
13C-1234-TCDD	332/334	NA	NA	NA	NA	0.74		0.65-0.89
13C-123789-HxCDD	402/404	NA	NA	NA	NA	1.19		1.05-1.43

QC limits are shown are for ion abundance ratios. Maximum %D for RRF is +/- 30.0%.

The laboratory must flag any analyte which does not meet criteria for %D or ion abundance ratio by placing an asterisk in the appropriate flag column.

AR310396

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

MB

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: MB

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0401005.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322					U	0.0939
2378-TCDF	304/306					U	0.0801
12378-PeCDF	340/342					U	0.0789
12378-PeCDD	356/358					U	0.1476
23478-PeCDF	340/342					U	0.0763
123478-HxCDF	374/376					U	0.0588
123678-HxCDF	374/376					U	0.0538
123478-HxCDD	390/392					U	0.0794
123678-HxCDD	390/392					U	0.0795
123789-HxCDD	390/392					U	0.0732
234678-HxCDF	374/376					U	0.0607
123789-HxCDF	374/376					U	0.0638
1234678-HpCDF	408/410					U	0.0625
1234678-HpCDD	424/426					U	0.0643
1234789-HpCDF	408/410					U	0.0683
OCDD	458/460					U	0.1312
OCDF	442/444					U	0.1270

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	#	RECOVERY LIMITS
13C-2378-TCDF	316/318	19.38	0.73		0.65-0.89	62.4		25-150
13C-2378-TCDD	332/334	19.98	0.72		0.65-0.89	61.4		25-150
13C-123678-HxCDD	402/404	29.75	1.20		1.05-1.43	81.2		25-150
13C-1234678-HpCDF	420/422	33.93	1.08		0.88-1.20	84.1		25-150
13C-OCDD	470/472	42.24	0.93		0.76-1.01	84.1		25-150
37Cl-2378-TCDD	328/NA	20.00	NA		NA	59.5		25-150

Column to be used to flag values outside QC limits.

2DF

PCDD/PCDF TOTAL HOMOLOGUE CONCENTRATION SUMMARY

EPA SAMPLE NO.

MB

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: MB

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0401005.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 uL % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

HOMOLOGUE	PEAKS	CONCENTRATION	Q	EMPC/EDL
DIOXINS				
Total TCDD			U	0.0939
Total PeCDD			U	0.1478
Total HxCDD			U	0.0732
Total HpCDD			U	0.0643
FURANS				
Total TCDF	1			0.4286
Total PeCDF			U	0.0763
Total HxCDF			U	0.0538
Total HpCDF			U	0.0625

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.
The total congener concentrations do not affect the TEF calculations.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

LCS

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: LCS

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0801009.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) pg/L

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	20.00	0.75		31.5414		
2378-TCDF	304/306	19.40	0.80		33.1902		
12378-PeCDF	340/342	23.46	1.50		95.8029		
12378-PeCDD	356/358	24.68	1.48		80.7242		
23478-PeCDF	340/342					U	0.0650
123478-HxCDF	374/376					U	0.0822
123678-HxCDF	374/376	28.55	1.16		93.4630		
123478-HxCDD	390/392					U	0.0879
123678-HxCDD	390/392	29.77	1.21		93.7430		
123789-HxCDD	390/392	30.36	1.26		4.7331	J	
234678-HxCDF	374/376					U	0.0848
123789-HxCDF	374/376					U	0.0891
1234678-HpCDF	408/410	33.95	1.00		95.6444		
1234678-HpCDD	424/426	35.76	1.02		73.8532		
1234789-HpCDF	408/410					U	0.1250
OCDD	458/460	42.28	0.82		204.1011		
OCDF	442/444	42.59	0.82		200.2192		

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	#	RECOVERY LIMITS
13C-2378-TCDF	316/318	19.38	0.73		0.65-0.89	76.6		25-150
13C-2378-TCDD	332/334	20.00	0.72		0.65-0.89	77.5		25-150
13C-123678-HxCDD	402/404	29.75	1.18		1.05-1.43	99.2		25-150
13C-1234678-HpCDF	420/422	33.95	1.05		0.88-1.20	81.1		25-150
13C-OCDD	470/472	42.28	0.93		0.76-1.01	69.2		25-150
37Cl-2378-TCDD	328/NA	20.00	NA		NA	73.7		25-150

Column to be used to flag values outside QC limits.

2DF

PCDD/PCDF TOTAL HOMOLOGUE CONCENTRATION SUMMARY

EPA SAMPLE NO.

LCS

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: LCS

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0801009.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 uL % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

HOMOLOGUE	PEAKS	CONCENTRATION	Q	EMPC/EDL
DIOXINS				
Total TCDD	1	31.54		
Total PeCDD	1	80.72		
Total HxCDD	2	98.48		
Total HpCDD	1	73.85		
FURANS				
Total TCDF	2	33.19		0.3714
Total PeCDF	1	95.80		
Total HxCDF	1	93.46		
Total HpCDF	1	95.64		

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.
The total congener concentrations do not affect the TEF calculations.

1DFB
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY

EPA SAMPLE NO.
LCS

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SAS No.:

Matrix: WATER (Soil/Water/Waste/Ash) SDG No.:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: LCS

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0801009.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: ng/L (ng/L or ug/Kg)

ANALYTE	CONCENTRATION		TEF		TEF-ADJUSTED CONCENTRATION
2378-TCDD	31.5414	x	1.0	=	31.541
2378-TCDF	33.1902	x	0.1	=	3.319
12378-PeCDF	95.8029	x	0.05	=	4.790
12378-PeCDD	80.7242	x	0.5	=	40.362
23478-PeCDF	00.0000	x	0.5	=	0.000
123478-HxCDF	00.0000	x	0.1	=	0.000
123678-HxCDF	93.4630	x	0.1	=	9.346
123478-HxCDD	00.0000	x	0.1	=	0.000
123678-HxCDD	93.7430	x	0.1	=	9.374
123789-HxCDD	04.7331	x	0.1	=	0.473
234678-HxCDF	00.0000	x	0.1	=	0.000
123789-HxCDF	00.0000	x	0.1	=	0.000
1234678-HpCDF	95.6444	x	0.01	=	0.956
1234678-HpCDD	73.8532	x	0.01	=	0.739
1234789-HpCDF	00.0000	x	0.01	=	0.000
OCDD	204.101	x	0.001	=	0.204
OCDF	200.219	x	0.001	=	0.200
		TOTAL =			101.31

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

LCSD

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: LCSD

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0901010.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	20.00	0.76		30.5597		
2378-TCDF	304/306	19.40	0.79		31.8993		
12378-PeCDF	340/342	23.46	1.49		97.5566		
12378-PeCDD	356/358	24.68	1.48		86.4035		
23478-PeCDF	340/342					U	0.0735
123478-HxCDF	374/376					U	0.0706
123678-HxCDF	374/376	28.55	1.19		88.4875		
123478-HxCDD	390/392					U	0.0894
123678-HxCDD	390/392	29.77	1.21		81.9523		
123789-HxCDD	390/392	30.38	1.25		3.6827	J	
234678-HxCDF	374/376					U	0.0729
123789-HxCDF	374/376					U	0.0765
1234678-HpCDF	408/410	33.95	0.99		81.0075		
1234678-HpCDD	424/426	35.76	1.04		68.6155		
1234789-HpCDF	408/410					U	0.1131
OCDD	458/460	42.28	0.81		165.7388		
OCDF	442/444	42.59	0.81		164.4001		

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	#	RECOVERY LIMITS
13C-2378-TCDF	316/318	19.38	0.73		0.65-0.89	68.8		25-150
13C-2378-TCDD	332/334	20.00	0.72		0.65-0.89	67.3		25-150
13C-123678-HxCDD	402/404	29.75	1.19		1.05-1.43	86.8		25-150
13C-1234678-HpCDF	420/422	33.95	1.07		0.88-1.20	80.5		25-150
13C-OCDD	470/472	42.26	0.94		0.78-1.01	59.0		25-150
37Cl-2378-TCDD	328/NA	20.00	NA		NA	65.1		25-150

Column to be used to flag values outside QC limits.

2DF

PCDD/PCDF TOTAL HOMOLOGUE CONCENTRATION SUMMARY

EPA SAMPLE NO.

LCSD

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SDG No.:

Matrix: WATER (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: LCSD

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0901010.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 uL % Solids: 0.0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ng/L

HOMOLOGUE	PEAKS	CONCENTRATION	Q	EMPC/EDL
DIOXINS				
Total TCDD	1	30.56		
Total PeCDD	1	86.40		
Total HxCDD	2	85.64		
Total HpCDD	1	68.62		
FURANS				
Total TCDF	2	31.90		0.4105
Total PeCDF	1	97.44		
Total HxCDF	1	88.49		
Total HpCDF	1	81.01		

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.
The total congener concentrations do not affect the TEF calculations.

1DFB
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY

EPA SAMPLE NO.
LCSD

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: SAS No.:

Matrix: WATER (Soil/Water/Waste/Ash) SDG No.:

Sample wt/vol: 1000 (g/mL) mL Lab Sample ID: LCSD

Water Sample Prep: SEPF (Sepf/Cont) Lab File ID: 0901010.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 09/22/95

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 10/09/95

Dilution Factor: 1

Concentration Units: ng/L (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	30.5597	x 1.0 =	30.560
2378-TCDF	31.8993	x 0.1 =	3.190
12378-PeCDF	97.5566	x 0.05 =	4.878
12378-PeCDD	86.4035	x 0.5 =	43.202
23478-PeCDF	00.0000	x 0.5 =	0.000
123478-HxCDF	00.0000	x 0.1 =	0.000
123678-HxCDF	88.4875	x 0.1 =	8.849
123478-HxCDD	00.0000	x 0.1 =	0.000
123678-HxCDD	81.9523	x 0.1 =	8.195
123789-HxCDD	03.6827	x 0.1 =	0.368
234678-HxCDF	00.0000	x 0.1 =	0.000
123789-HxCDF	00.0000	x 0.1 =	0.000
1234678-HpCDF	81.0075	x 0.01 =	0.810
1234678-HpCDD	68.6155	x 0.01 =	0.686
1234789-HpCDF	00.0000	x 0.01 =	0.000
OCDD	165.739	x 0.001=	0.166
OCDF	164.400	x 0.001=	0.164
		TOTAL =	101.07

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

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