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U.S. EPA Region III
Office of Analytical Services and Quality Assurance
Annapolis, Maryland

ANALYTICAL REPORT

WILMINGTON DRUM
SUPERFUND REMOVAL/REMEDIAL
Lab Request # REQ99016

December 15, 1998

U.S. EPA Region III
Office of Analytical Services
and Quality Assurance
Annapolis, Maryland

December 15, 1998

ANALYTICAL RESULTS: WILMINGTON DRUM [REQ99016]

Dear William C. Wentworth (3HS33),

Enclosed is our analytical report for the above case. It is organized into several sections: Analytical Request and Sample Descriptions, Organic, Inorganic, and Microbiological Results. All data were peer reviewed.

Analytical Request and Sample Descriptions: (General)
Each laboratory assigned number, station, description, matrix, sample date and locational data is reported. A table summarizes the tests assigned to each sample. A glossary and qualifier code definition is provided.

Inorganic Results:
For requests assigned inorganic tests, results are grouped by service group, e.g., Metals. Sample results are reported; non-detects are provided with the actual quantitation limit. Method description and quality control protocols are described in analyst narratives.

Organic Results:
For requests assigned organic tests, results are grouped by service group, e.g., Volatile Organic Compounds. Only detected analytes are reported. Nominal Quantitation Limit (NQL) tables are provided for each service group. Specific information for the calculation of Actual Quantitation Limits (AQL) achieved for a given sample is included. Quality control values are provided in summary tables with acceptance criteria. Method description and quality control protocols are described in analyst narratives.

Microbiological Results:
For requests assigned microbiological tests, sample results and quality control values are incorporated into a single table. Method description and quality control protocols are described in analyst narratives.

If you have any questions we may be reached at 410-573-2600.

Approval for Release:
Susan Warner

Site Contact(s): Kevin Burns (WESTON)
William C. Wentworth (3HS33)

U.S. EPA Region III
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and Quality Assurance
Annapolis, Maryland

Facility: WILMINGTON DRUM
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SAMPLE DESCRIPTIONS

Sample #	Station Description	Matrix	Type	End Collection Date	Time	Latitude	Longitude
98102101	STA SD-01, SD-01	Soil	GRAB	10/19/98	15:40		
98102102	STA SD-02, SD-02	Soil	GRAB	10/19/98	11:00		
98102103	STA SD-03, SD-03	Soil	GRAB	10/19/98	11:30		
98102104	STA SD-06, SD-06	Soil	GRAB	10/19/98	13:00		
98102105	STA SD 05, SD-05	Soil	GRAB	10/19/98	10:00		
98102106	STA SD-04, SD-04	Soil	GRAB	10/19/98	12:30		
98102107	STA TB-1, TB-1	Aqueous Blank	GRAB	10/19/98	08:00		
98102108	STA FB-1, FB-1	Aqueous Blank	GRAB	10/19/98	12:00		
98102109	STA SW-04, SW-04	Water - Type Unspecified	GRAB	10/19/98	12:30		
98102110	STA SW-06, SW-06	Water - Type Unspecified	GRAB	10/19/98	13:00		
98102111	STA SW-01, SW-01	Water - Type Unspecified	GRAB	10/19/98	15:40		
98102112	STA SW-02, SW-02	Water - Type Unspecified	GRAB	10/19/98	11:00		
98102113	STA SW-03, SW-03	Water - Type Unspecified	GRAB	10/19/98	11:30		
98102114	STA SW-05, SW-05	Water - Type Unspecified	GRAB	10/19/98	10:00		

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TESTS REQUESTED

Inorganic Test Assigned	Sample No. 981021-													
	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Metals Analysis	X	X	X	X	X	X		X	X	X	X	X	X	X
Percent Dry Weight	X	X	X	X	X	X								
Total Cyanide	X	X	X	X	X	X		X	X	X	X	X	X	X

Organic Test Assigned	Sample No. 981021-													
	01	02	03	04	05	06	07	08	09	10	11	12	13	14
PCBs and Pesticides by Gas Chromatography	X	X	X	X	X	X		X	X	X	X	X	X	X
Semivolatile Organics by GC/MS	X	X	X	X	X	X		X	X	X	X	X	X	X
Volatile Organics by Purge & Trap GC/MS	X	X	X	X	X	X	X	X	X	X	X	X	X	X

AR100008

(X = test was requested)

QUALIFIER CODE AND GLOSSARY DEFINITIONS

Qualifier Codes:

<	=	Sample value is below the quantitation limit. Quantitation limit reported.
</=	=	Reported value is estimated. Sample was analyzed in duplicate, one value is equal to or above the quantitation limit and one below. Average of quantitation limit and detected value reported.
>	=	Sample value is above the quantitation range.
A	=	Quality control value is outside acceptance limits.
B	=	Not detected substantially above (10 times) the level reported in the laboratory or field blanks (includes field, trip, rinsate, and equipment blanks).
C	=	See report narrative for analyst's observations concerning this result.
D	=	Sample and duplicate values are below the quantitation limit. Quantitation limit reported.
E	=	Value exceeds a theoretically greater value (e.g. dissolved > total, orthophosphate > total phosphorus). However, the difference is within the expected precision of the analytical techniques and is not statistically significant.
I	=	An interference exists which masks true response. See report narrative for explanation.
J	=	Analyte present. Reported value is estimated, concentration is outside the range for accurate quantitation.
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.
N	=	Presumptive evidence indicates the presence of the compound. Special methods and/or method modifications may be needed to confirm its presence or absence in future sampling efforts.
NA	=	Analysis was not requested.
Q	=	No analytical results. See report for explanation.
R	=	Unreliable results. Analyte may or may not be present in the sample. Supporting data is necessary to confirm results.
T	=	Tentatively Identified Compound. Identified as a result of a library search using the EPA/NIH Mass Spectral Library. Authentic standards were not available to properly identify and quantitate the compound. The reported concentration is an estimate.
TD	=	Spike recovery too dilute for accurate quantitation.
UJ	=	Not detected. Quantitation limit is estimated.
UL	=	Not detected. Quantitation limit is probably higher.

Glossary:

( )	=	Numbers in parentheses are analytical spike recoveries (e.g. post-digestion spikes).
[ ]	=	Numbers in brackets are matrix spike recoveries (e.g. pre-digestion spikes).
MS/MSD	=	Matrix spike/matrix spike duplicate; a known increment of target analyte made to a sample before preparation or analyses.
MSA	=	Method of Standard Additions
RPD	=	Relative Percent Difference; the results for duplicate analyses are presented as the mean and the relative percent difference.

$$RPD = \frac{|Replicate1 - Replicate2|}{(Replicate1 + Replicate2)/2} \times 100$$

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INORGANIC ANALYTICAL REPORT

WILMINGTON DRUM

SUPERFUND REMOVAL/REMEDIAL

Lab Request # REQ99016

U.S. EPA Region III
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Facility: WILMINGTON DRUM
Program: SUPERFUND REMOVAL/REMEDIAL

Lab Request #: REQ99016

INORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:	98102101			98102102			98102103			98102104		
Station ID :	SD-01			SD-02			SD-03			SD-06		
ANALYTES	SAMPLE			SAMPLE			SAMPLE			SAMPLE		
Metals Analysis	Units: ug/g	% Rec	RPD	ug/g	% Rec	RPD	ug/g	% Rec	RPD	ug/g	% Rec	RPD
Aluminum	3380	(101)		23800			12900			23400		
Antimony	<0.3	(91)		<0.3	(108)		3.2	(88)		0.8	(91)	
Arsenic	0.6	(93)		57.7	(87)		25.7	(MSA)		11.5	(94)	
Barium	32.3			214			342			346		
Beryllium	0.2	(97)		1.4			<1.2			1.4		
Cadmium	<0.5	(95)		<2.5			6.1			<2.5		
Calcium	2680			3900			4330			3830		
Chromium	9.2			82.0			145			103		
Cobalt	3.5			22.0			22.1			22.2		
Copper	14.3	(98)		33.2			9270			90.5		
Iron	7400	(93)		61600			52800			42300		
Lead	20.5			91.1			12500	(101)		1970		
Magnesium	1280			5980			3570			6130		
Manganese	288	(94)		1930			1020			1590		
Mercury	<0.1			0.3			0.8			0.4		
Nickel	6.9			31.6			100			44.0		
Potassium	503			2610			1290			2650		
Selenium	<0.5	(92)		0.6	(MSA)		1.4	(MSA)		0.7	(MSA)	
Silver	<1.0			<5.0			<5.0			<5.0		
Sodium	<100			691			598			779		
Thallium	<0.3	(109)		<0.3	(107)		<0.3	(107)		<0.3	(108)	
Vanadium	11.3			61.3			202			59.4		
Zinc	73.0	(98)		176			869			675		
Percent Dry Weight	Units: %	% Rec	RPD	%	% Rec	RPD	%	% Rec	RPD	%	% Rec	RPD
Percent Dry Weight (105C)	71.4			56.2			61.2			56.9		
Percent Dry Weight (60C)	73.9			59.7			64.0			57.1		

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INORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:	98102101			98102102			98102103			98102104		
Station ID :	SD-01			SD-02			SD-03			SD-06		
ANALYTES (continued)	SAMPLE			SAMPLE			SAMPLE			SAMPLE		
Total Cyanide	**Units: mg/Kg**	**% Rec**	**RPD**	**mg/Kg**	**% Rec**	**RPD**	**mg/Kg**	**% Rec**	**RPD**	**mg/Kg**	**% Rec**	**RPD**
Cyanide	<1.0			<1.0			<1.0	(98)		<1.0		

Sample Number:	98102105			98102106			98102108			98102109		
Station ID :	SD-05			SD-04			FB-1			SW-04		
ANALYTES	SAMPLE			SAMPLE			FIELD BLANK			SAMPLE		
Metals Analysis	**Units: ug/g**	**% Rec**	**RPD**	**ug/g**	**% Rec**	**RPD**	**ug/L**	**% Rec**	**RPD**	**ug/L**	**% Rec**	**RPD**
Aluminum	17100			21300		6	<200			721	[89]	16
Antimony	0.6	(94)		0.7	(88)	26	<60			<60		D
Arsenic	20.7	(89)		15.8	(92)	4	<1			2	[108]	18
Barium	161			192	[108]	1	<200			<200	[93]	D
Beryllium	<1.2			<=1.2			<5			<5	[93]	D
Cadmium	<2.5			<=2.5			<5			<5	[94]	D
Calcium	5120			3560	[104]	2	<500			38300		11
Chromium	85.9			107	[101]	2	<10			<10	[96]	D
Cobalt	16.1			21.4	[103]	7	<50			<50	[94]	D
Copper	123			272		5	<25			<25	[92]	D
Iron	47200			71400		3	<100			1150	[87]	13
Lead	214			572	[113]	6	<1			9	[95]	0
Magnesium	4760			5740	[94]	2	<500			44600		3
Manganese	1600			1520		5	<15			90	[94]	12
Mercury	0.3			0.4	(99)	2	<0.2			<0.2	[105]	D
Nickel	33.8			56.0	[106]	5	<40			<40	[95]	D
Potassium	1780			2450	[95]	0	<1000			17200	[93]	7
Selenium	0.7	(MSA)		0.7	[114]	12	<2			<2	[90]	D
Silver	<5.0			<5.0	[112]	D	<10			<10	[90]	D
Sodium	658			714	[100]	0	<1000			319000		1
Thallium	<0.3	(108)		<0.3	[89]	D	<3			<3	[94]	D

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INORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:	98102105			98102106			98102108			98102109		
Station ID :	SD-05			SD-04			FB-1			SW-04		
ANALYTES (continued)	SAMPLE			SAMPLE			FIELD BLANK			SAMPLE		
Metals Analysis	Units: ug/g	% Rec	RPD	ug/g	% Rec	RPD	ug/L	% Rec	RPD	ug/L	% Rec	RPD
Vanadium	54.1			56.8	[99]	3	<50			<50	[93]	D
Zinc	402			2380		6	<20			<20	[99]	D
Percent Dry Weight	Units: %	% Rec	RPD	%	% Rec	RPD						
Percent Dry Weight (105C)	69.4			55.3		1						
Percent Dry Weight (60C)	67.5			57.9		3						
Total Cyanide	Units: mg/Kg	% Rec	RPD	mg/Kg	% Rec	RPD	mg/L	% Rec	RPD	mg/L	% Rec	RPD
Cyanide	<1.0			<1.0	[107]	D	<0.02			<0.02	[94]	D

Sample Number:	98102110			98102111			98102112			98102113		
Station ID :	SW-06			SW-01			SW-02			SW-03		
ANALYTES	SAMPLE			SAMPLE			SAMPLE			SAMPLE		
Metals Analysis	Units: ug/L	% Rec	RPD	ug/L	% Rec	RPD	ug/L	% Rec	RPD	ug/L	% Rec	RPD
Aluminum	1980			<200			446			537		
Antimony	<60			<60	(102)		<60			<60		
Arsenic	2	(112)		<1	(112)		1	(115)		1	(112)	
Barium	<200			<200			<200			<200		
Beryllium	<5			<5			<5			<5		
Cadmium	<5			<5			<5			<5		
Calcium	37800			27500	(102)		34400			36800		
Chromium	11			<10			<10			<10		
Cobalt	<50			<50			<50			<50		
Copper	<25			<25			<25			<25		
Iron	3010			215			784			899		
Lead	16	(101)		<1	(110)		2	(106)		2	(105)	
Magnesium	48900			10300	(103)		38400			46500		

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INORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:	98102110			98102111			98102112			98102113		
Station ID :	SW-06			SW-01			SW-02			SW-03		
ANALYTES (continued)	SAMPLE			SAMPLE			SAMPLE			SAMPLE		
Metals Analysis	**Units: ug/L**	**% Rec**	**RPD**	**ug/L**	**% Rec**	**RPD**	**ug/L**	**% Rec**	**RPD**	**ug/L**	**% Rec**	**RPD**
Manganese	156			28			89			87		
Mercury	<0.2			<0.2			<0.2			<0.2		
Nickel	<40			<40			<40			<40		
Potassium	18600			4070			14300			17700		
Selenium	<2	(97)		<2	(103)		<2	(99)		<2	(98)	
Silver	<10			<10			<10			<10		
Sodium	359000			16000	(102)		270000			344000		
Thallium	<3	(101)		<3	(107)		<3	(102)		<3	(101)	
Vanadium	<50			<50			<50			<50		
Zinc	43			<20			<20			<20		
Total Cyanide	**Units: mg/L**	**% Rec**	**RPD**	**mg/L**	**% Rec**	**RPD**	**mg/L**	**% Rec**	**RPD**	**mg/L**	**% Rec**	**RPD**
Cyanide	<0.02			<0.02			<0.02			<0.02		

Sample Number:	98102114		
Station ID :	SW-05		
ANALYTES	SAMPLE		
Metals Analysis	**Units: ug/L**	**% Rec**	**RPD**
Aluminum	1660		
Antimony	<60		
Arsenic	1	(115)	
Barium	<200		
Beryllium	<5		
Cadmium	<5		
Calcium	32400		
Chromium	<10		
Cobalt	<50		

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INORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:	98102114
Station ID :	SW-05
ANALYTES (continued)	SAMPLE

Metals Analysis	Units: ug/L	% Rec	RPD
Copper	<25		
Iron	2710		
Lead	7	(106)	
Magnesium	35500		
Manganese	145		
Mercury	<0.2		
Nickel	<40		
Potassium	14000		
Selenium	<2	(99)	
Silver	<10		
Sodium	259000		
Thallium	<3	(102)	
Vanadium	<50		
Zinc	38		

Total Cyanide	Units: mg/L	% Rec	RPD
Cyanide	<0.02	(100)	

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INORGANIC WET/DRY CONVERSION

Sample Number:		98102101		98102102		98102103		98102104		98102105	
		WET	DRY	WET	DRY	WET	DRY	WET	DRY	WET	DRY
ANALYTES		SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE
Percent Dry Weight	Units:	%		%		%		%		%	
Percent Dry Weight (105C)		71.4		56.2		61.2		56.9		69.4	
Percent Dry Weight (60C)		73.9		59.7		64.0		57.1		67.5	
Metals Analysis	Units:	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g
Aluminum		2500	3380	14200	23800	8260	12900	13400	23400	11500	17100
Antimony		< 0.2	< 0.3	< 0.2	< 0.3	2.0	3.2	0.5	0.8	0.4	0.6
Arsenic		0.4	0.6	34.4	57.7	16.4	25.7	6.6	11.5	14.0	20.7
Barium		23.9	32.3	127.8	214	218.9	342	197.6	346	108.7	161
Beryllium		0.1	0.2	0.8	1.4	< 0.8	< 1.2	0.8	1.4	< 0.8	< 1.2
Cadmium		< 0.4	< 0.5	< 1.5	< 2.5	3.9	6.1	< 1.4	< 2.5	< 1.7	< 2.5
Calcium		1980	2680	2330	3900	2770	4330	2190	3830	3460	5120
Chromium		6.8	9.2	49.0	82.0	92.8	145	58.8	103	58.0	85.9
Cobalt		2.6	3.5	13.1	22.0	14.1	22.1	12.7	22.2	10.9	16.1
Copper		10.6	14.3	19.8	33.2	5930	9270	51.7	90.5	83.0	123
Iron		5470	7400	36800	61600	33800	52800	24200	42300	31900	47200
Lead		15.1	20.5	54.4	91.1	8000	12500	1120	1970	144.5	214
Magnesium		945.9	1280	3570	5980	2280	3570	3500	6130	3210	4760
Manganese		212.8	288	1150	1930	652.8	1020	907.9	1590	1080	1600
Mercury		< 0.1	< 0.1	0.2	0.3	0.5	0.8	0.2	0.4	0.2	0.3
Nickel		5.1	6.9	18.9	31.6	64.0	100	25.1	44.0	22.8	33.8
Potassium		371.7	503	1560	2610	825.6	1290	1510	2650	1200	1780
Selenium		< 0.4	< 0.5	0.4	0.6	0.9	1.4	0.4	0.7	0.5	0.7
Silver		< 0.7	< 1.0	< 3.0	< 5.0	< 3.2	< 5.0	< 2.9	< 5.0	< 3.4	< 5.0
Sodium		< 73.9	< 100	412.5	691	382.7	598	444.8	779	444.2	658
Thallium		< 0.2	< 0.3	< 0.2	< 0.3	< 0.2	< 0.3	< 0.2	< 0.3	< 0.2	< 0.3
Vanadium		8.4	11.3	36.6	61.3	129.3	202	33.9	59.4	36.5	54.1
Zinc		53.9	73.0	105.1	176	556.2	869	385.4	675	271.4	402

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INORGANIC WET/DRY CONVERSION

Sample Number:		98102101		98102102		98102103		98102104		98102105	
		WET SAMPLE	DRY SAMPLE	WET SAMPLE	DRY SAMPLE	WET SAMPLE	DRY SAMPLE	WET SAMPLE	DRY SAMPLE	WET SAMPLE	DRY SAMPLE
ANALYTES (continued)											
Total Cyanide	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Cyanide		<1.0	< 1.4	<1.0	< 1.8	<1.0	< 1.6	<1.0	< 1.8	<1.0	< 1.4

Sample Number:		98102106	
		WET SAMPLE	DRY SAMPLE
ANALYTES			
Percent Dry Weight	Units:	%	%
Percent Dry Weight (105C)		55.3	
Percent Dry Weight (60C)		57.9	
Metals Analysis	Units:	ug/g	ug/g
Aluminum		12300	21300
Antimony		0.4	0.7
Arsenic		9.1	15.8
Barium		111.2	192
Beryllium		<= 0.7	<= 1.2
Cadmium		<= 1.4	<= 2.5
Calcium		2060	3560
Chromium		62.0	107
Cobalt		12.4	21.4
Copper		157.5	272
Iron		41300	71400
Lead		331.2	572
Magnesium		3320	5740
Manganese		880.1	1520
Mercury		0.2	0.4
Nickel		32.4	56.0
Potassium		1420	2450
Selenium		0.4	0.7
Silver		< 2.9	< 5.0

R0017

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INORGANIC WET/DRY CONVERSION

Sample Number:		98102106	
		WET SAMPLE	DRY SAMPLE
ANALYTES (continued)			
Metals Analysis	**Units:**	**ug/g**	**ug/g**
Sodium		413.4	714
Thallium		< 0.2	< 0.3
Vanadium		32.9	56.8
Zinc		1380	2380
Total Cyanide	**Units:**	**mg/Kg**	**mg/Kg**
Cyanide		<1.0	< 1.8

The wet/dry weight conversion table is presented for the convenience of the data user. The attached analyst narratives state whether a test was determined on a wet or dry weight basis. Any difference in significant figures between the two columns is an artifact of the reporting function and does not imply that the calculated value has greater precision than the measured value.

Percent Dry Weight Determinations

Analyst:

Steven A. Bartirno
LMES Chemist

Method:

The soil samples from the WILMINGTON DRUM site (REQ99016) were analyzed for Percent Dry Weight as required by EPA analytical methods. The samples were dried at 105°C following the procedure outlined in the EPA Region III OASQA laboratory SOP #R3QA056.0.

These results are to be used to convert analyte concentrations to a dry weight basis for organic and non-metal analyses. Normally, analytical values are reported on a wet weight basis for organic and non-metals. All metals reported use a 60°C drying temperature for the percent dry weight determinations, as required by the methodology. The 60°C percent dry weight values are reported with the metals results, if applicable.

Metals Determinations

Analysts:

R. Fisher — LMES Chemist
M. Mecanic — LMES Chemist

Methods:

Samples from WILMINGTON DRUM site (REQ99016) were prepared for analysis by acid digestion and analyzed by graphite furnace atomic absorption spectroscopy (GFAAS) and inductively coupled plasma-atomic emission spectrometry (ICP-AES). The results are presented in the attached table. The following are the digestion and analytical techniques and methods employed:

Digestion Methods
Method from CLP SOW 9/91 revision, p. D-5, A.1. for GFAAS (excluding antimony)
Method from CLP SOW 9/91 revision, p. D-5, A.2. for ICP-AES

EPA Method 3050A, excluding HCl for GFAAS (excluding antimony) (solid samples) (2)
EPA Method 3050A, for ICP-AES and antimony by GFAAS (solid samples) (2)

Analytical Methods
EPA Method 204.2 and Internal SOP R3-QA132, antimony by GFAAS (1)
EPA Method 206.2 and Internal SOP R3-QA132, arsenic by GFAAS (1)
EPA Method 239.2 and Internal SOP R3-QA132, lead by GFAAS (1)
EPA Method 270.2 and Internal SOP R3-QA132, selenium by GFAAS (1)
EPA Method 279.2 and Internal SOP R3-QA132, thallium by GFAAS (1)
EPA Method 200.7 and Internal SOP R3-QA132, remaining elements by ICP-AES (1)

(1) EPA Manual of Methods for Chemical Analysis of Water and Wastes, 1979/83.
(2) SW-846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Volume IA, Final Update I, July 1992.

Results for solid samples are reported in ug/g (ppm) DRY weight at 60 degrees centigrade. This, Percent Dry Weight test, pertains only to metals results. The drying temperature of 60 degrees centigrade is selected to retain volatile elements. The % Dry Weight (60 °C) is reported to allow for conversion to wet weight.

Note: The quantitation limits for silver, beryllium and cadmium in the following samples are elevated due to dilutions for matrix interferences:

Silver:	981021-02 through 981021-06
Beryllium:	981021-03, 981021-05, 981021-06
Cadmium:	981021-02, 981021-04, 981021-05, 981021-06

Mercury Determinations

Analysts:

Odis Cain	Steve Bartimo
LMES Chemist	LMES Chemist

Method:

Samples from WILMINGTON DRUM site (REQ99016) were analyzed for total mercury using EPA Methods 245.1[1] and 245.5[1].

Results for solid samples are reported in ug/g Dry weight at 60 degrees centigrade. This Percent Dry Weight test pertains only to metals results. The drying temperature of 60 degrees centigrade is selected to retain volatile elements. The Percent Dry Weight (60 degrees C) is reported to allow for conversion to wet weight.

[1]Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020.

Total Cyanide Determinations

Analyst:

Odis W. Cain
LMES CHEMIST

Method:

Samples from WILMINGTON DRUM site (REQ99016) were analyzed for Total Cyanide determination using EPA Method 335.4.

Soil results are reported on a wet weight basis.

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ORGANIC ANALYTICAL REPORT

WILMINGTON DRUM

SUPERFUND REMOVAL/REMEDIAL

Lab Request # REQ99016

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ORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:		98102101	98102102	98102103	98102104	98102105	98102106	98102107	98102108
Station ID :		SD-01	SD-02	SD-03	SD-06	SD-05	SD-04	TB-1	FB-1
ANALYTES		SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	TRIP BLANK	FIELD BLANK
Percent Dry Weight		%	%	%	%	%	%		
Percent Dry Weight (105C)		71.4	56.2	61.2	56.9	69.4	55.3		
NQL Factor:		1	1	1	1	1	1		1
PCBs and Pesticides by Gas Chromatography	**Units:**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**		**ug/L**
Alpha Chlordane				0.014 R,I					
Aroclor 1260				0.35	0.090	0.72	0.081		
4,4'-DDD					0.0088 I				
4,4'-DDE				0.018 R,I	0.0074 R,I				
4,4'-DDT				0.050 R,I	0.0095 R,I	0.030 R,I	0.0079 R,I		
Endosulfan-II						0.024 I			
Endrin					0.0097 I				
Gamma Chlordane				0.011 R,I					
NQL Factor:		1	1	1	1	1	1		1
Semivolatile Organics by GC/MS	**Units:**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**		**ug/L**
Anthracene				0.06 J	0.04 J	0.07 J			
Benzo(a)Anthracene			0.2 J	0.3 J	0.2 J	0.3 J	0.1 J		
Benzo(a)Pyrene			0.1 J	0.3 J	0.2 J	0.2 J	0.1 J		
Benzo(B)Fluoranthene			0.1 J	0.3 J	0.2 J	0.2 J	0.1 J		
Benzo(g,h,i)Perylene			0.08 J	0.2 J	0.1 J	0.2 J	0.08 J		
Benzo(k)Fluoranthene			0.2 J	0.2 J	0.2 J	0.2 J	0.2 J		
Bis(2-Ethylhexyl)Phthalate				0.07 B	0.04 B	0.2 B	0.38		
Carbazole		UJ	UJ	0.05 J	UJ	UJ	UJ		UJ
4-Chloroaniline		UJ	UJ	UJ	UJ	UJ	UJ		UJ
Chrysene		0.03 J	0.2 J	0.35	0.2 J	0.3 J	0.1 J		
Di-n-Butylphthalate				0.04 J					
Dibenzo(a,h)Anthracene			0.05 J	0.08 J	0.06 J	0.1 J	0.04 J		
4,6-Dinitro-2-Methylphenol									
2,4-Dinitrophenol		UJ	UJ	UJ	UJ	UJ	UJ		UJ
Fluoranthene		0.04 J	0.2 J	0.49	0.3 J	0.47	0.2 J		
Indeno(1,2,3-cd)Pyrene			0.1 J	0.2 J	0.1 J	0.2 J	0.09 J		
2-Methylnaphthalene				0.04 J					
Naphthalene				0.06 J	0.08 J	0.08 J			

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ORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:		98102101	98102102	98102103	98102104	98102105	98102106	98102107	98102108
Station ID :		SD-01	SD-02	SD-03	SD-06	SD-05	SD-04	TB-1	FB-1
ANALYTES (continued)		SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	TRIP BLANK	FIELD BLANK
NQL Factor:		1	1	1	1	1	1		1
Semivolatile Organics by GC/MS	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg		ug/L
3-Nitroaniline		UJ	UJ	UJ	UJ	UJ	UJ		UJ
Phenanthrene			0.09 J	0.3 J	0.2 J	0.3 J	0.07 J		
Pyrene		0.03 J	0.2 J	0.51	0.3 J	0.52	0.2 J		
NQL Factor:		1	1	1	1	1	1	1	1
Volatile Organics by Purge & Trap GC/MS	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/L	ug/L
Bromobenzene									UJ
2-Chloroethylvinyl Ether		UJ	UJ	UJ	UJ	UJ	UJ		Q
2-Chlorotoluene									UJ
4-Chlorotoluene									UJ
1,2-Dibromo-3-Chloropropane		UJ	UJ	UJ	UJ	UJ	UJ		
2,2-Dichloropropane			UJ						
Naphthalene		UJ	3 J	UJ	UJ	UJ	UJ		UJ
N-Propylbenzene									UJ
1,2,3 Trichlorobenzene		UJ	UJ	UJ	UJ	UJ	UJ		
1,2,3-Trichloropropane									UJ
1,2,4-Trimethylbenzene									UJ
Vinyl Acetate								UJ	

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ORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:		98102109	98102110	98102111	98102112	98102113	98102114
Station ID :		SW-04	SW-06	SW-01	SW-02	SW-03	SW-05
ANALYTES		SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE
NQL Factor:		1	1	1	1	1	1
Semivolatile Organics by GC/MS	**Units:**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Carbazole		UJ	UJ	UJ	UJ	UJ	UJ
4-Chloroaniline		UJ	UJ	UJ	UJ	UJ	UJ
4,6-Dinitro-2-Methylphenol				UJ	UJ	UJ	UJ
2,4-Dinitrophenol		UJ	UJ	UJ	UJ	UJ	UJ
3-Nitroaniline		UJ	UJ	UJ	UJ	UJ	UJ
NQL Factor:		1	1	1	1	1	1
Volatile Organics by Purge & Trap GC/MS	**Units:**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Bromobenzene		UJ	UJ	UJ	UJ	UJ	UJ
2-Chloroethylvinyl Ether		Q	Q	Q	Q	Q	Q
2-Chlorotoluene		UJ	UJ	UJ	UJ	UJ	UJ
4-Chlorotoluene		UJ	UJ	UJ	UJ	UJ	UJ
Naphthalene		UJ	UJ	UJ	UJ	UJ	UJ
N-Propylbenzene		UJ	UJ	UJ	UJ	UJ	UJ
1,2,3-Trichloropropane		UJ	UJ	UJ	UJ	UJ	UJ
1,2,4-Trimethylbenzene		UJ	UJ	UJ	UJ	UJ	UJ
Vinyl Acetate							

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ORGANIC QUALITY CONTROL (SURROGATE RECOVERIES)

Matrix: SOLIDS

SURROGATES	Surrogate Limits	98102101 SD-01 SAMPLE	98102102 SD-02 SAMPLE	98102103 SD-03 SAMPLE	98102104 SD-06 SAMPLE	98102105 SD-05 SAMPLE	98102106 SD-04 SAMPLE
PCBs and Pesticides by Gas Chromatography	**Range**	%	%	%	%	%	%
Decachlorobiphenyl	(60-150)	112	109	160 A	114	120	109
Tetrachloro-M-Xylene	(60-150)	106	104	101	103	107	99
Semivolatile Organics by GC/MS	**Range**	%	%	%	%	%	%
2-Fluoro-1,1'-Biphenyl	(30-115)	72	77	80	80	81	61
2-Fluorophenol	(25-121)	68	59	69	66	66	48
d5-Nitrobenzene	(23-120)	66	54	65	63	64	47
d5 Phenol	(24-113)	69	68	75	72	72	52
d14-Terphenyl	(18-137)	93	90	94	94	98	73
2,4,6-Tribromophenol	(19-122)	47	44	48	47	55	27
Volatile Organics by Purge & Trap GC/MS	**Range**	%	%	%	%	%	%
Bromofluorobenzene	(59-113)	82	109	80	97	87	80
d4-1,2-Dichloroethane	(70-121)	104	105	109	102	100	108
d8-Toluene	(84-138)	98	97	105	115	101	103

Matrix: WATER

SURROGATES	Surrogate Limits	98102107 TB-1 TRIP BLANK	98102108 FB-1 FLD BLANK	98102109 SW-04 SAMPLE	98102110 SW-06 SAMPLE	98102111 SW-01 SAMPLE	98102112 SW-02 SAMPLE	98102113 SW-03 SAMPLE	98102114 SW-05 SAMPLE
PCBs and Pesticides by Gas Chromatography	**Range**	%	%	%	%	%	%	%	%
Decachlorobiphenyl	(60-150)		89	49 A	56 A	83	51 A	54 A	52 A
Tetrachloro-M-Xylene	(60-150)		101	90	92	104	94	96	98
Semivolatile Organics by GC/MS	**Range**	%	%	%	%	%	%	%	%
2-Fluoro-1,1'-Biphenyl	(43-116)		69	66	67	64	73	66	66
2-Fluorophenol	(21-110)		73	72	70	63	74	56	70
d5-Nitrobenzene	(35-114)		75	69	68	68	79	63	71
d5-Phenol	(10-110)		63	64	63	66	75	63	71
d14-Terphenyl	(33-141)		90	93	90	88	86	86	84

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ORGANIC QUALITY CONTROL (SURROGATE RECOVERIES)

Matrix: WATER

SURROGATES (continued)	Surrogate Limits	98102107 TB-1 TRP BLANK	98102108 FB-1 FLD BLANK	98102109 SW-04 SAMPLE	98102110 SW-06 SAMPLE	98102111 SW-01 SAMPLE	98102112 SW-02 SAMPLE	98102113 SW-03 SAMPLE	98102114 SW-05 SAMPLE
Semivolatile Organics by GC/MS	**Range**	%	%	%	%	%	%	%	%
2,4,6-Tribromophenol	(10-123)		62	74	74	86	86	86	83
Volatile Organics by Purge & Trap GC/MS	**Range**	%	%	%	%	%	%	%	%
Bromofluorobenzene	(86-115)	103	99	109	101	99	100	105	103
d4-1,2-Dichloroethane	(76-114)	92	110	105	105	117 A	110	106	113
d8-Toluene	(88-110)	101	91	85 A	92	90	93	92	90

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ORGANIC QUALITY CONTROL (MATRIX SPIKE RECOVERIES)

Matrix: SOLIDS

98102106
SD-04

ANALYTES	Spike Recovery MS	Spike Recovery MSD	Recovery Limits	RPD	RPD Limits
PCBs and Pesticides by Gas Chromatography	**%**	**%**	**Range**	**RPD**	**Limit**
Aldrin	90	89	(34-132)	2	43
4,4' DDT	88	155 A	(23-134)	55 A	50
Dieldrin	98	97	(31-134)	1	38
Endrin	111	110	(42-139)	1	45
Gamma BHC (Lindane)	97	94	(46-127)	3	50
Heptachlor	121	115	(35-130)	5	31
Semivolatile Organics by GC/MS	**%**	**%**	**Range**	**RPD**	**Limit**
Acenaphthene	81	81	(31-137)	0	19
4-Chloro-3-Methylphenol	84	83	(26-103)	2	33
2-Chlorophenol	60	64	(25-102)	6	50
Di-n-Butylphthalate	94	94	(11-117)	1	40
1,4-Dichlorobenzene	43	52	(28-104)	18	27
2,4-Dinitrotoluene	72	73	(28- 89)	1	47
4-Nitrophenol	79	79	(11-114)	0	50
N-Nitroso-di-n-Propylamine	54	57	(41-126)	6	38
Pentachlorophenol	15 A	21	(17-109)	35	47
Phenol	65	67	(26- 90)	3	35
Pyrene	93	91	(35-142)	3	36
1,2,4-Trichlorobenzene	52	58	(38-107)	11	23
Volatile Organics by Purge & Trap GC/MS	**%**	**%**	**Range**	**RPD**	**Limit**
Benzene	98	103	(66-142)	5	21
Chlorobenzene	98	109	(60-133)	10	21
1,1-Dichloroethene	75	80	(59-172)	6	22
Toluene	94	111	(59-139)	16	21
Trichloroethene	89	92	(62-137)	4	24

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ORGANIC QUALITY CONTROL (MATRIX SPIKE RECOVERIES)

Matrix: WATER

ANALYTES	Spike Recovery MS	Spike Recovery MSD	Recovery Limits	RPD	RPD Limits
PCBs and Pesticides by Gas Chromatography	%	%	Range	RPD	Limit
Aldrin	59	92	(40-120)	44 A	22
4,4' DDT	46	75	(38-127)	48 A	27
Dieldrin	70	99	(52-126)	35 A	18
Endrin	74	106	(56-121)	35 A	21
Gamma BHC (Lindane)	71	100	(56-123)	34 A	15
Heptachlor	61	91	(40-131)	39 A	20
Semivolatile Organics by GC/MS	%	%	Range	RPD	Limit
Acenaphthene	78	86	(46-118)	10	31
4-Chloro-3-Methylphenol	86	88	(23- 97)	3	42
2-Chlorophenol	55	65	(27-123)	16	40
Di-n-Butylphthalate	85	93	(11-117)	9	40
1,4-Dichlorobenzene	55	56	(36- 97)	2	28
2,4-Dinitrotoluene	74	84	(24- 96)	12	38
4-Nitrophenol	99 A	103 A	(10- 80)	5	50
N-Nitroso-di-n-Propylamine	56	67	(41 116)	18	38
Pentachlorophenol	73	76	(9-103)	3	50
Phenol	54	63	(12-110)	14	42
Pyrene	98	105	(26-127)	6	31
1,2,4 Trichlorobenzene	53	57	(39- 98)	6	28
Volatile Organics by Purge & Trap GC/MS	%	%	Range	RPD	Limit
Benzene	93	98	(76-127)	5	11
Chlorobenzene	95	96	(75-130)	2	13
1,1-Dichloroethene	79	83	(61-145)	5	14
Toluene	78	79	(76-125)	0	13
Trichloroethene	83	93	(71-120)	11	14

98102109
SW-04

1300-130

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LABORATORY REAGENT BLANK RESULTS

Method: PCBs and Pesticides by Gas Chromatography

Run: OC981022 1 LRB

SURROGATES	NQL Factor	% Rec
Decachlorobiphenyl	1	97
Tetrachloro-M-Xylene	1	91

Run: OC981026 1 LRB

SURROGATES	NQL Factor	% Rec
Decachlorobiphenyl	1	104
Tetrachloro-M-Xylene	1	100

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LABORATORY REAGENT BLANK RESULTS

Method: Semivolatile Organics by GC/MS

Run: OI98B231 18 LRB

SURROGATES	MQL	Factor	% Rec
2-Fluoro-1,1'-Biphenyl		1	68
2-Fluorophenol		1	78
d5-Nitrobenzene		1	69
d5-Phenol		1	65
d14-Terphenyl		1	96
2,4,6-Tribromophenol		1	50

ANALYTES	MQL	Factor	mg/Kg
Bis(2-Ethylhexyl)Phthalate		1	0.03 J
Carbazole		1	UJ
4 Chloroaniline		1	UJ
2,4-Dinitrophenol		1	UJ
3-Nitroaniline		1	UJ

Run: OI98B231 19 LRB

SURROGATES	MQL	Factor	% Rec
2-Fluoro-1,1'-Biphenyl		1	78
2-Fluorophenol		1	80
d5-Nitrobenzene		1	80
d5-Phenol		1	70
d14-Terphenyl		1	100
2,4,6-Tribromophenol		1	70

ANALYTES	MQL	Factor	ug/L
Carbazole		1	UJ
4-Chloroaniline		1	UJ
2,4-Dinitrophenol		1	UJ
3-Nitroaniline		1	UJ

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LABORATORY REAGENT BLANK RESULTS

Method: Volatile Organics by Purge & Trap GC/MS

Run: OH981123 17 LRB

SURROGATES	NQL Factor	% Rec
Bromofluorobenzene	1	81
d4-1,2-Dichloroethane	1	102
d8-Toluene	1	97

ANALYTES	NQL Factor	ug/Kg
Benzene	1	2 J
Chlorobenzene	1	2 J
2-Chloroethylvinyl Ether	1	UJ
1,2-Dibromo-3-Chloropropane	1	UJ
Methylene Chloride	1	1 J
Naphthalene	1	UJ
Toluene	1	2 J
1,2,3-Trichlorobenzene	1	UJ
Trichloroethene	1	2 J

Run: OH981123 18 LRB

SURROGATES	NQL Factor	% Rec
Bromofluorobenzene	1	103
d4-1,2-Dichloroethane	1	104
d8-Toluene	1	88

ANALYTES	NQL Factor	ug/L
Bromobenzene	1	UJ
2-Chloroethylvinyl Ether	1	Q
2-Chlorotoluene	1	UJ
4-Chlorotoluene	1	UJ
Methylene Chloride	1	2 J
Naphthalene	1	UJ
N-Propylbenzene	1	UJ

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LABORATORY REAGENT BLANK RESULTS

1,2,4-Trimethylbenzene	1	UJ

Run: OH981123 19 LRB

SURROGATES	NQL Factor	% Rec
Bromofluorobenzene	1	143 A
d4-1,2-Dichloroethane	1	111
d8-Toluene	1	80 A

ANALYTES	NQL Factor	ug/L
Bromobenzene	1	UJ
2-Chloroethylvinyl Ether	1	Q
2-Chlorotoluene	1	UJ
4-Chlorotoluene	1	UJ
Dibromochloromethane	1	UJ
2,2-Dichloropropane	1	UJ
N-Propylbenzene	1	UJ
1,2,3-Trichloropropane	1	UJ

Run: OH981123 20 LRB

SURROGATES	NQL Factor	% Rec
Bromofluorobenzene	1	83
d4-1,2-Dichloroethane	1	102
d8-Toluene	1	101

ANALYTES	NQL Factor	ug/Kg
2-Chloroethylvinyl Ether	1	UJ
1,2-Dibromo-3-Chloropropane	1	UJ
2,2-Dichloropropane	1	UJ
Naphthalene	1	UJ
1,2,3-Trichlorobenzene	1	UJ

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LABORATORY REAGENT BLANK RESULTS

Method: Volatile Organics by Purge & Trap GC/MS

Run: OH981123 21 LRB

SURROGATES	MQL	Factor	% Rec
Bromofluorobenzene		1	104
d4-1,2-Dichloroethane		1	89
d8-Toluene		1	102

ANALYTES	MQL	Factor	ug/L
Methylene Chloride		1	1 J
Vinyl Acetate		1	UJ

Office of Analytical Services and Quality Assurance
Volatile Organics Analysis
Nominal Quantitation Limits (NQL)

Units: Water = ug/L NPTC = Non-Priority Pollutant Target Compound

Actual Quantitation Limit = (NQL Factor) X NQL

CAS	ANALYTE		NQL
75-71-8	Dichlorodifluoromethane		5
74-87-3	Chloromethane		5
75-01-4	Vinyl Chloride		5
74-83-9	Bromomethane		5
75-00-3	Chloroethane		5
75-69-4	Trichlorofluoromethane		5
75-35-4	1,1-Dichloroethylene		5
75-15-0	Carbon Disulfide	NPTC	5
67-64-1	Acetone	NPTC	5
75-09-2	Methylene Chloride		5
156-60-5	trans-1,2-Dichloroethene		5
75-34-3	1,1-Dichloroethane		5
108-05-4	Vinyl Acetate	NPTC	5
590-20-7	2,2-Dichloropropane		5
156-59-4	cis-1,2-Dichloroethene	NPTC	5
78-93-3	2-Butanone	NPTC	5
74-97-5	Bromochloromethane	NPTC	5
65-66-3	Chloroform		5
71-55-6	1,1,1-Trichloroethane		5
56-23-5	Carbon Tetrachloride		5
563-58-6	1,1-Dichloropropene		5
71-43-2	Benzene		5
107-06-2	1,2-Dichloroethane		5
79-01-6	Trichloroethylene		5
78-87-5	1,2-Dichloropropane		5
74-95-3	Dibromomethane	NPTC	5
75-27-4	Bromodichloromethane		5
110-75-8	2-Chloroethylvinyl ether		5
10061-01-6	trans-1,3-Dichloropropene	NPTC	5
108-10-1	4-Methyl-2-pentanone		5
108-88-3	Toluene		5
10061-01-5	cis-1,3-Dichloropropene		5
79-00-5	1,1,2-Trichloroethane		5
127-18-4	Tetrachloroethylene		5

CAS	ANALYTE		NQL
142-28-9	1,3-Dichloropropane	NPTC	5
591-78-6	2-Hexanone	NPTC	5
124-48-1	Dibromochloromethane		5
106-93-4	1,2-Dibromoethane(EDB)	NPTC	5
108-90-7	Chlorobenzene		5
630-20-6	1,1,1,2-Tetrachloroethane	NPTC	5
100-41-4	Ethylbenzene		5
108-38-3	m-Xylene (m & p isomers	NPTC	5
106-42-3	p-Xylene together)	NPTC	5
95-47-6	o-Xylene	NPTC	10
100-42-5	Styrene	NPTC	10
75-25-2	Bromoform		5
98-82-8	Isopropylbenzene	NPTC	5
108-86-1	Bromobenzene	NPTC	5
79-34-5	1,1,2,2-Tetrachloroethane		5
96-18-4	1,2,3-Trichloropropane	NPTC	5
103-65-1	n-Propylbenzene	NPTC	5
95-49-8	2-Chlorotoluene	NPTC	5
106-43-4	4-Chlorotoluene	NPTC	5
108-67-8	1,3,5-Trimethylbenzene	NPTC	5
98-06-6	tert-Butylbenzene	NPTC	5
95-63-6	1,2,4-Trimethylbenzene	NPTC	5
135-98-8	sec-Butylbenzene	NPTC	5
541-73-1	1,3-Dichlorobenzene		5
106-46-7	1,4-Dichlorobenzene		5
99-87-6	p-Isopropyltoluene	NPTC	5
95-50-1	1,2-Dichlorobenzene		5
104-51-8	n-Butylbenzene	NPTC	5
96-12-8	1,2-Dibromo-3-chloropropane		5
120-82-1	1,2,4-Trichlorobenzene		5
91-20-3	Naphthalene		5
87-68-3	Hexachlorobutadiene		5
87-61-6	1,2,3-Trichlorobenzene	NPTC	5

The "Nominal Quantitation Limit" factor is an overall correction factor applied to the method's NQLs for analytical adjustments made during the analysis (i.e., for analyses of less than the ideal 5 mls for aqueous samples, and for sample dilutions prior to analysis).

For example, if the NQL factor for an OASQA water sample is 2, the estimated Actual Quantitation Limit for vinyl chloride would be 10 ug/L (i.e., 2 x 5 ug/L).

Rev. October 16, 1996

Office of Analytical Services and Quality Assurance
Volatile Organics Analysis
Nominal Quantitation Limits (NQL)

Units: Solids = ug/kg (wet) NPTC = Non-Priority Pollutant Target Compound

Actual Quantitation Limit = (NQL Factor) X NQL

CAS	ANALYTE		NQL
75-71-8	Dichlorodifluoromethane		5
74-87-3	Chloromethane		5
75-01-4	Vinyl Chloride		5
74-83-9	Bromomethane		5
75-00-3	Chloroethane		5
75-69-4	Trichlorofluoromethane		5
75-35-4	1,1-Dichloroethylene		5
75-15-0	Carbon Disulfide	NPTC	5
67-64-1	Acetone	NPTC	5
75-09-2	Methylene Chloride		5
156-60-5	trans-1,2-Dichloroethene		5
75-34-3	1,1-Dichloroethane		5
108-05-4	Vinyl Acetate	NPTC	5
590-20-7	2,2-Dichloropropane		5
156-59-4	cis-1,2-Dichloroethene	NPTC	5
78-93-3	2-Butanone	NPTC	5
74-97-5	Bromochloromethane	NPTC	5
65-66-3	Chloroform		5
71-55-6	1,1,1-Trichloroethane		5
56-23-5	Carbon Tetrachloride		5
563-58-6	1,1-Dichloropropene		5
71-43-2	Benzene		5
107-06-2	1,2-Dichloroethane		5
79-01-6	Trichloroethylene		5
78-87-5	1,2-Dichloropropane		5
74-95-3	Dibromomethane	NPTC	5
75-27-4	Bromodichloromethane		5
110-75-8	2-Chloroethylvinyl ether		5
10061-01-6	trans-1,3-Dichloropropene	NPTC	5
108-10-1	4-Methyl-2-pentanone		5
108-88-3	Toluene		5
10061-01-5	cis-1,3-Dichloropropene		5
79-00-5	1,1,2-Trichloroethane		5
127-18-4	Tetrachloroethylene		5

CAS	ANALYTE		NQL
142-28-9	1,3-Dichloropropane	NPTC	5
591-78-6	2-Hexanone	NPTC	5
124-48-1	Dibromochloromethane		5
106-93-4	1,2-Dibromoethane(EDB)	NPTC	5
108-90-7	Chlorobenzene		5
630-20-6	1,1,1,2-Tetrachloroethane	NPTC	5
100-41-4	Ethylbenzene		5
108-38-3	m-Xylene (m & p isomers	NPTC	5
106-42-3	p-Xylene together)	NPTC	5
95-47-6	o-Xylene	NPTC	10
100-42-5	Styrene	NPTC	10
75-25-2	Bromoform		5
98-82-8	Isopropylbenzene	NPTC	5
108-86-1	Bromobenzene	NPTC	5
79-34-5	1,1,2,2-Tetrachloroethane		5
96-18-4	1,2,3-Trichloropropane	NPTC	5
103-65-1	n-Propylbenzene	NPTC	5
95-49-8	2-Chlorotoluene	NPTC	5
106-43-4	4-Chlorotoluene	NPTC	5
108-67-8	1,3,5-Trimethylbenzene	NPTC	5
98-06-6	tert-Butylbenzene	NPTC	5
95-63-6	1,2,4-Trimethylbenzene	NPTC	5
135-98-8	sec-Butylbenzene	NPTC	5
541-73-1	1,3-Dichlorobenzene		5
106-46-7	1,4-Dichlorobenzene		5
99-87-6	p-Isopropyltoluene	NPTC	5
95-50-1	1,2-Dichlorobenzene		5
104-51-8	n-Butylbenzene	NPTC	5
96-12-8	1,2-Dibromo-3-chloropropane		5
120-82-1	1,2,4-Trichlorobenzene		5
91-20-3	Naphthalene		5
87-68-3	Hexachlorobutadiene		5
87-61-6	1,2,3-Trichlorobenzene	NPTC	5

The "Nominal Quantitation Limit" factor is an overall correction factor applied to the method's NQLs for analytical adjustments made during the analysis (i.e., for analyses of more or less than the ideal 5 grams for soil samples, for sample dilutions prior to analysis).

For example, if the NQL factor for an OASQA soil sample is 2, the estimated Actual Quantitation Limit for vinyl chloride would be 10 ug/kg (i.e., 2 x 5 ug/kg).

Rev. October 16, 1996

Office of Analytical Services and Quality Assurance
Pesticide and PCB Analysis
Nominal Quantitation Limits (NQL)

Units: Water = ug/L NPTC = Non-Priority Pollutant Target Compound

Actual Quantitation Limit = (NQL Factor) X NQL

CAS	Pesticide		NQL
319-84-6	Alpha-BHC		0.05
319-85-7	Beta-BHC		0.05
319-86-8	Delta-BHC		0.05
58-89-8	Gamma-BHC		0.05
76-44-8	Heptachlor		0.05
309-00-2	Aldrin		0.05
1024-57-3	Heptachlor Epoxide		0.05
959-98-8	Endosulfan I		0.05
60-57-1	Dieldrin		0.10
72-55-9	4,4'-DDE		0.10
72-20-8	Endrin		0.10
33213-65-9	Endosulfan II		0.10
72-54-8	4,4'-DDD		0.10
1031-07-8	Endosulfan Sulfate		0.10
50-29-3	4,4'-DDT		0.10
7421-93-4	Endrin Aldehyde		0.10
53494-70-5	Endrin Ketone	NPTC	0.10
72-43-5	Methoxychlor	NPTC	0.50
5103-71-9	Alpha-Chlordane		0.05
5103-74-2	Gamma-Chlordane		0.05
57-74-9	Chlordane		1.0
8001-35-2	Toxaphene		5.0

CAS	PCB	NQL
12674-11-2	Aroclor-1016	1.0
11104-28-2	Aroclor-1221	1.0
11141-16-5	Aroclor-1232	1.0
53469-21-9	Aroclor-1242	1.0
12672-29-6	Aroclor-1248	1.0
11097-69-1	Aroclor-1254	1.0
11096-82-5	Aroclor-1260	1.0

The "Nominal Quantitation Limit" listed for each target compound is based on the Superfund CLP Protocol. The Actual Quantitation Limits are related to the NQLs by the NQL Factor. This NQL factor reflects procedural steps, e.g., extract dilution, which influence quantitation limits.

Rev. October 16, 1996

Office of Analytical Services and Quality Assurance
Pesticide and PCB Analysis
Nominal Quantitation Limits (NQL)

Units: Solids = mg/kg NPTC = Non-Priority Pollutant Target Compound

Actual Quantitation Limit = (NQL Factor) X NQL

CAS	Pesticide		NQL
319-84-6	Alpha-BHC		0.002
319-85-7	Beta-BHC		0.002
319-86-8	Delta-BHC		0.002
58-89-8	Gamma-BHC		0.002
76-44-8	Heptachlor		0.002
309-00-2	Aldrin		0.002
1024-57-3	Heptachlor Epoxide		0.002
959-98-8	Endosulfan I		0.002
60-57-1	Dieldrin		0.003
72-55-9	4,4'-DDE		0.003
72-20-8	Endrin		0.003
33213-65-9	Endosulfan II		0.003
72-54-8	4,4'-DDD		0.003
1031-07-8	Endosulfan Sulfate		0.003
50-29-3	4,4'-DDT		0.003
7421-93-4	Endrin Aldehyde		0.003
53494-70-5	Endrin Ketone	NPTC	0.003
72-43-5	Methoxychlor	NPTC	0.017
5103-71-9	Alpha-Chlordane		0.002
5103-74-2	Gamma-Chlordane		0.002
57-74-9	Chlordane		0.033
8001-35-2	Toxaphene		0.167

CAS	PCB	NQL
12674-11-2	Aroclor-1016	0.033
1104-28-2	Aroclor-1221	0.033
11141-16-5	Aroclor-1232	0.033
53469-21-9	Aroclor-1242	0.033
12672-29-6	Aroclor-1248	0.033
11097-69-1	Aroclor-1254	0.033
11096-82-5	Aroclor-1260	0.033

The "Nominal Quantitation Limit" listed for each target compound is based on the Superfund CLP Protocol. The Actual Quantitation Limits are related to the NQLs by the NQL Factor. This NQL factor reflects procedural steps, e.g., extract dilution, which influence quantitation limits.

Rev. October 16, 1996

Office of Analytical Services and Quality Assurance
Extractable Organics Analysis
Nominal Quantitation Limits (NQL)

Units: Water = ug/L NPTC = Non-Priority Pollutant Target Compound

Actual Quantitation Limit = (NQL Factor) X NQL

CAS	ANALYTE		NQL
62-75-9	N-Nitrosodimethylamine		10
108-95-2	Phenol		10
62-53-3	Aniline	NPTC	10
111-44-4	bis(2-Chloroethyl)Ether		10
95-57-8	2-Chlorophenol		10
541-73-1	1,3-Dichlorobenzene		10
106-46-7	1,4-Dichlorobenzene		10
100-51-6	Benzyl Alcohol	NPTC	10
95-50-1	1,2-Dichlorobenzene		10
95-48-7	2-Methylphenol	NPTC	10
108-60-1	bis(2-chloroisopropyl)Ether		10
106-44-5	4-Methylphenol	NPTC	10
621-64-7	N-Nitroso-di-n-Propylamine		10
67-72-1	Hexachloroethane		10
98-95-3	Nitrobenzene		10
78-59-1	Isophorone		10
88-75-5	2-Nitrophenol		10
105-67-9	2,4-Dimethylphenol		10
65-85-0	Benzoic Acid	NPTC	50
111-91-1	bis(2-Chloroethoxy)Methane		10
20-83-2	2,4-Dichlorophenol		10
120-82-1	1,2,4-Trichlorobenzene		10
91-20-3	Naphthalene		10
106-47-8	4-Chloroaniline	NPTC	10
87-68-3	Hexachlorobutadiene		10
59-50-7	4-Chloro-3-Methylphenol		10
91-57-6	2-Methylnaphthalene	NPTC	10
77-47-4	Hexachlorocyclopentadiene		10
88-06-2	2,4,6-Trichlorophenol		10
95-95-4	2,4,5-Trichlorophenol	NPTC	50
91-58-7	2-Chloronaphthalene		10
88-74-4	2-Nitroaniline	NPTC	50
131-11-3	Dimethylphthalate		10
208-96-8	Acenaphthylene		10

CAS	ANALYTE		NQL
99-09-2	3-Nitroaniline	NPTC	50
83-32-9	Acenaphthene		10
51-28-5	2,4-Dinitrophenol		50
100-02-7	4-Nitrophenol		50
132-64-9	Dibenzofuran	NPTC	10
606-20-2	2,6-Dinitrotoluene		10
121-14-2	2,6-Dinitrotoluene		10
84-66-2	Diethylphthalate		10
7005-72-3	4-Chlorophenylphenylether		10
86-73-7	Fluorene		10
100-01-6	4-Nitroaniline	NPTC	50
86-30-6	N-Nitrosodiphenylamine(1)		10
534-52-1	4,6-Dinitro-2-Methylphenol		50
101-55-3	4-Bromophenylphenylether		10
118-74-1	Hexachlorobenzene		10
87-86-5	Pentachlorophenol		50
85-01-8	Phenanthrene		10
120-12-7	Anthracene		10
86-74-8	Carbazole	NPTC	10
84-74-2	Di-n-Butylphthalate		10
206-44-0	Fluoranthene		10
92-87-5	Benzidine		50
129-00-0	Pyrene		10
85-68-7	Butylbenzylphthalate		10
91-94-1	3,3'-Dichlorobenzidine		20
56-55-3	Benzo(a)Anthracene		10
117-81-7	bis(2-Ethylhexyl)Phthalate		10
218-01-9	Chrysene		10
117-84-0	Di-n-Octylphthalate		10
205-99-2	Benzo(b)Fluoranthene		10
207-08-9	Benzo(k)Fluoranthene		10
50-32-8	Benzo(a)Pyrene		10
193-39-5	Indeno(1,2,3-cd)Pyrene		10
53-70-3	Dibenzo(a,h)Anthracene		10
191-24-2	Benzo (g,h,i)Perylene		10

(1) N-nitrosodiphenylamine decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine.

The "Nominal Quantitation Limit" factor is an overall correction factor applied to the method's NQLs for analytical adjustments made during the analysis (i.e., for extractions of more or less than the ideal 1000 ml for aqueous samples, for sample extracts not concentrated to 1.00 ml due to excessive foaming/darkness of the extract, and for sample extract dilutions prior to analyses).

Rev. October 16, 1996

Office of Analytical Services and Quality Assurance
Extractable Organics Analysis
Nominal Quantitation Limits (NQL)

Units: Solids = mg/kg (wet) NPTC = Non-Priority Pollutant Target Compound

Actual Quantitation Limit = (NQL Factor) X NQL

CAS	ANALYTE		NQL
62-75-9	N-Nitrosodimethylamine		0.33
108-95-2	Phenol		0.33
62-53-3	Aniline	NPTC	0.33
111-44-4	bis(2-Chloroethyl)Ether		0.33
95-57-8	2-Chlorophenol		0.33
541-73-1	1,3-Dichlorobenzene		0.33
106-46-7	1,4-Dichlorobenzene		0.33
100-51-6	Benzyl Alcohol	NPTC	0.33
95-50-1	1,2-Dichlorobenzene		0.33
95-48-7	2-Methylphenol	NPTC	0.33
108-60-1	bis(2-chloroisopropyl)Ether		0.33
106-44-5	4-Methylphenol	NPTC	0.33
621-64-7	N-Nitroso-di-n-Propylamine		0.33
67-72-1	Hexachloroethane		0.33
98-95-3	Nitrobenzene		0.33
78-59-1	Isophorone		0.33
88-75-5	2-Nitrophenol		0.33
105-67-9	2,4-Dimethylphenol		0.33
65-85-0	Benzoic Acid	NPTC	1.67
111-91-1	bis(2-Chloroethoxy)Methane		0.33
120-83-2	2,4-Dichlorophenol		0.33
120-82-1	1,2,4-Trichlorobenzene		0.33
91-20-3	Naphthalene		0.33
106-47-8	4-Chloroaniline	NPTC	0.33
87-68-3	Hexachlorobutadiene		0.33
59-50-7	4-Chloro-3-Methylphenol		0.33
91-57-6	2-Methylnaphthalene	NPTC	0.33
77-47-4	Hexachlorocyclopentadiene		0.33
88-06-2	2,4,6-Trichlorophenol		0.33
95-95-4	2,4,5-Trichlorophenol	NPTC	1.67
91-58-7	2-Chloronaphthalene		0.33
88-74-4	2-Nitroaniline	NPTC	1.67
131-11-3	Dimethylphthalate		0.33
208-96-8	Acenaphthylene		0.33

CAS	ANALYTE		NQL
99-09-2	3-Nitroaniline	NPTC	1.67
83-32-9	Acenaphthene		0.33
51-28-5	2,4-Dinitrophenol		1.67
100-02-7	4-Nitrophenol		1.67
132-64-9	Dibenzofuran	NPTC	0.33
606-20-2	2,6-Dinitrotoluene		0.33
121-14-2	2,6-Dinitrotoluene		0.33
84-66-2	Diethylphthalate		0.33
7005-72-3	4-Chlorophenylphenylether		0.33
86-73-7	Fluorene		0.33
100-01-6	4-Nitroaniline	NPTC	1.67
86-30-6	N-Nitrosodiphenylamine(1)		0.33
534-52-1	4,6-Dinitro-2-Methylphenol		1.67
101-55-3	4-Bromophenylphenylether		0.33
118-74-1	Hexachlorobenzene		0.33
87-86-5	Pentachlorophenol		1.67
85-01-8	Phenanthrene		0.33
120-12-7	Anthracene		0.33
86-74-8	Carbazole	NPTC	0.33
84-74-2	Di-n-Butylphthalate		0.33
206-44-0	Fluoranthene		0.33
92-87-5	Benzidine		1.67
129-00-0	Pyrene		0.33
85-68-7	Butylbenzylphthalate		0.33
91-94-1	3,3'-Dichlorobenzidine		0.67
56-55-3	Benzo(a)Anthracene		0.33
117-81-7	bis(2-Ethylhexyl)Phthalate		0.33
218-01-9	Chrysene		0.33
117-84-0	Di-n-Octylphthalate		0.33
205-99-2	Benzo(b)Fluoranthene		0.33
207-08-9	Benzo(k)Fluoranthene		0.33
50-32-8	Benzo(a)Pyrene		0.33
193-39-5	Indeno(1,2,3-cd)Pyrene		0.33
53-70-3	Dibenzo(a,h)Anthracene		0.33
191-24-2	Benzo(g,h,i)Perylene		0.33

(1) N-nitrosodiphenylamine decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine.

The "Nominal Quantitation Limit" factor is an overall correction factor applied to the method's NQLs for analytical adjustments made during the analysis (i.e., for extractions of more or less than the ideal 30 grams for soil samples, for sample extracts not concentrated to 1.00 ml due to excessive foaming/darkness of the extract, and for sample extract dilutions prior to analyses).

For example, the typical NQL factor for an OASQA soil sample is 1.5. Therefore, the estimated Actual Quantitation Limit for phenol would be 0.50 mg/Kg (i.e., 1.5 x .33 mg/Kg).

Rev. October 16, 1996

Volatile Organic Analysis by GC/MS

Analyst:

Douglas Gardner
LMES Chemist

Method:

Eight aqueous and six soil samples from the WILMINGTON DRUM site (REQ99016) were analyzed for the presence of volatile organic compounds amenable to purge and trap and identifiable by mass spectrometry. The samples were collected October 19, 1998 and analyzed October 22, 23, 26, 27, 1998 and November 9, 1998, using a consolidated method derived from EPA methods SDWA 524.2, NPDES 624, RCRA 8260 and the Superfund CLP Statement of Work.

All samples were initially analyzed within the 14 day technical holding time, except sample 981021-07. Due to a sample tracking error, this sample was analyzed 7 days beyond the holding time. No target analytes were detected in this sample and no data were qualified for this sample.

For the aqueous samples analyzed using the initial calibration on October 15, 1998, the nominal quantitation limit (NQL) for each compound is as listed in the attached table, except the NQLs for dichlorodifluoromethane, chloromethane, vinyl chloride, chloroethane, 4-methyl-2-pentanone, 2-hexanone, 1,2-dibromo-3-chloropropane, naphthalene, and 1,2,3-trichlorobenzene are 10. In addition, 2-chloroethylvinyl ether was not amenable to purge and trap and was not identifiable by mass spectrometry. For the aqueous samples analyzed using the initial calibration on November 9, 1998, the NQL for each compound is as listed in the attached table, except the NQLs for acetone, 4-methyl-2-pentanone, and 2-hexanone are 10 and the NQLs for vinyl acetate, 2 butanone and 2-chloroethylvinyl ether are 50.

For the soil samples, the NQL for each compound is as listed in the attached table, except the NQLs for dichlorodifluoromethane, chloromethane, vinyl chloride, chloroethane, and 2,2-dichloropropane are 10 and the NQL for 2-chloroethylvinyl ether is 50.

Only detected results are reported. The results for the soil samples are reported on a WET weight basis. No tentatively identified compounds (TICs) were detected in the samples.

Tentatively Identified Compounds

Site: Wilmington Drum
Program: Superfund Removal/Remedial

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/Kg)
981021-01		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/Kg)
981021-02		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/Kg)
981021-03		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/Kg)
981021-04		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/Kg)
981021-05		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/Kg)
981021-06		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/L)
981021-07		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/L)
981021-08		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/L)
981021-09		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/L)
981021-10		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/L)
981021-11		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/L)
981021-12		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/L)
981021-13		None Detected		

Sample No.	CAS#	COMPOUND NAME	R.T.	CONC (ug/L)
981021-14		None Detected		

Pesticide/PCB Analysis By Gas Chromatography

Analyst:

Timothy M. Casey
LMES Chemist

Method:

Thirteen mixed matrix samples from WILMINGTON DRUM site (REQ99016) were analyzed for polychlorinated biphenyls and/or pesticides by capillary column gas chromatography. All extractions and analyses were performed according to SOP R3-QA207.0. This SOP is a consolidated method derived from EPA methods SDWA 508, NPDES 608, RCRA 8081 & 8082, and the Superfund CLP Statement of Work. The samples were collected October 19, 1998; extracted October 22 and 26, 1998; and analyzed November 3, 4, 5, and 6, 1998. All soil results are reported on a WET WEIGHT basis.

Quality Control:

Six of the twenty-six surrogate recoveries were outside the acceptance limit criteria (60-150% recovery). One of the twenty-four matrix spike recoveries was outside the acceptance limits and seven of the twelve matrix spike relative percent difference (RPD) values were outside the acceptance limits. These values have been flagged with an "A".

Continuing calibration criteria were monitored for target pesticides. All sample results were bracketed by valid calibration check standards.

Due to the complex nature of the sample matrix, non-target interference peaks may be eluting within pesticide retention time windows. Target analyte results with relative percent difference greater than 25% between the two analytical columns may be considered suspect and have been flagged with an "R".

Due to the presence of polychlorinated biphenyls (PCBs) in several samples, PCB congener peaks may be eluting within pesticide retention time windows. Pesticide results attributed to PCB interference have been flagged with an "I".

The nominal quantitation limit factors for these samples are listed below.

Sample	Nominal Quantitation Limit Factor
981021-01	2.0 Pesticides 1.0 PCBs/Surrogates
981021-02	2.0 Pesticides 1.0 PCBs/Surrogates
981021-03	5.0 Pesticides 1.0 PCBs/Surrogates
981021-04	2.0 Pesticides 1.0 PCBs/Surrogates
981021-05	5.0 Pesticides 1.0 PCBs/Surrogates
981021-06	2.0 Pesticides 1.0 PCBs/Surrogates
981021-08	1.0 All Compounds
981021-09	1.0 All Compounds
981021-10	1.0 All Compounds
981021-11	1.0 All Compounds
981021-12	1.0 All Compounds
981021-13	1.0 All Compounds
981021-14	1.0 All Compounds

Semi-volatile Analysis by GC/MS

Analyst:

Hoang Nguyen
LMES Chemist

Method:

Six soil and seven aqueous samples from WILMINGTON DRUM site (REQ99016) were analyzed for the presence of semi-volatile organic compounds amenable to soxhlet and continuous liquid/liquid extraction and identifiable by mass spectrometry. The samples were collected October 19, 1998 and were extracted October 22 and 26, 1998. These samples were analyzed October 29, November 02 and 03, 1998 by a consolidated method derived from EPA methods SDWA 525.2, NPDES 625, RCRA 8270 and the Superfund CLP Statement of Work.

Only detected results are reported. The results for soil samples are reported on a WET weight basis. The NQL factor for all samples is equal to 1. Tentatively identified compounds (TICs) have been corrected for any blank contamination. The TICs are reported below.

TENTATIVELY IDENTIFIED COMPOUNDS

Site: Wilmington Drum '
Program: Superfund Removal/Remedial

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-01	******	Unknown m/z = 43	05.94	0.3 T
	******	Unknown m/z = 41	06.37	0.6 T
	******	Unknown m/z = 85	08.92	2.3 T
	******	Unknown m/z = 43	10.59	0.8 T
	******	Unknown m/z = 43	12.04	0.4 T
	******	Unknown m/z = 43	12.50	0.8 T
	******	Unknown m/z = 55	24.78	0.8 T
	057103	Hexadecanoic acid	24.95	0.5 T
	******	Unknown m/z = 79	28.12	0.3 T

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-02	******	Unknown m/z = 85	08.91	2.5 T
	******	Unknown m/z = 43	10.58	0.5 T
	******	Unknown m/z = 43	12.43	0.4 T
	******	Unknown m/z = 55	24.75	0.3 T
	057103	Hexadecanoic acid	24.95	0.6 T
	057114	Octadecanoic acid	26.81	0.3 T
	******	Unknown m/z = 69	32.06	0.3 T
	******	Unknown alkane m/z = 57	32.48	0.6 T
	******	Unknown alkane m/z = 57	32.97	0.4 T
	******	Unknown m/z = 59	34.05	0.3 T
	******	Unknown m/z = 59	35.90	0.2 T
	******	Unknown m/z = 81	36.22	0.2 T

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-03	******	Unknown m/z = 43	05.92	0.4 T
	******	Unknown m/z = 85	08.92	2.4 T
	******	Unknown m/z = 43	10.59	0.4 T
	******	Unknown m/z = 43	12.53	0.7 T
	******	Unknown m/z = 55	24.79	0.4 T
	******	Unknown m/z = 43	31.35	0.5 T
	******	Unknown m/z = 43	31.66	0.6 T
	******	Unknown alkane m/z = 57	32.51	1.0 T
	******	Unknown m/z = 57	32.97	0.6 T
	******	Unknown m/z = 59	35.95	0.4 T

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-04	******	Unknown m/z = 43	05.90	0.3 T
	******	Unknown m/z = 85	08.92	2.7 T
	******	Unknown m/z = 43	10.59	0.6 T
	******	Unknown m/z = 43	12.53	0.6 T
	******	Unknown m/z = 55	24.79	0.5 T
	057103	Hexadecanoic acid	24.97	0.4 T
	******	Unknown alkane m/z = 57	32.51	0.8 T
	******	Unknown m/z = 95	36.27	0.4 T

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-05	******	Unknown m/z = 85	08.91	2.0 T
	******	Unknown m/z = 43	12.49	0.4 T
	******	Unknown m/z = 55	24.80	0.5 T
	057103	Hexadecanoic acid	25.01	0.5 T
	******	Unknown alkane m/z = 57	31.13	0.4 T
	******	Unknown alkane m/z = 57	31.85	0.5 T
	******	Unknown alkane m/z = 57	32.54	1.8 T
	******	Unknown m/z = 191	32.99	1.1 T
	******	Unknown m/z = 59	33.35	0.4 T
	******	Unknown m/z = 43	33.51	0.6 T
	******	Unknown m/z = 191	34.65	0.5 T
	******	Unknown m/z = 59	35.98	0.8 T

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-06	******	Unknown m/z = 85	08.91	2.0 T
	******	Unknown m/z = 43	10.58	0.3 T
	******	Unknown m/z = 43	12.42	0.3 T
	057103	Hexadecanoic acid	24.96	0.3 T
	******	Unknown alkane m/z = 57	31.10	0.2 T
	******	Unknown m/z = 59	31.58	0.2 T
	******	Unknown alkane m/z = 57	32.50	0.5 T
	538238	Glycerol tricaprylate	32.85	0.4 T
	******	Unknown m/z = 59	35.94	0.2 T
	******	Unknown m/z = 81	36.29	0.3 T

UNITS: ug/L

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-08		None Detected		

UNITS: ug/L

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-09	******	Unknown m/z = 69	05.27	8 T
	******	Unknown m/z = 41	06.16	6 T
	******	Unknown m/z = 109	09.25	1 T
	134623	Diethyltoluamide	20.93	1 T
	******	Unknown m/z = 55	24.77	1 T
	******	Unknown m/z = 79	25.88	1 T

UNITS: ug/L

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-10	******	Unknown m/z = 69	05.29	4 T
	******	Unknown m/z = 41	06.18	3 T

UNITS: ug/L

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-11	******	Unknown m/z = 69	05.22	3 T
	******	Unknown m/z = 45	05.43	2 T
	******	Unknown m/z = 41	06.11	2 T

UNITS: ug/L

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-12	******	Unknown m/z = 69	05.23	12 T
	******	Unknown m/z = 45	05.44	2 T
	******	Unknown m/z = 41	06.11	11 T

UNITS: ug/L

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-13	******	Unknown m/z = 69	05.26	12 T
	******	Unknown m/z = 41	06.13	10 T
	******	Unknown m/z = 79	25.85	1 T

UNITS: ug/L

SAMPLE NO.	CAS #	TIC NAME	RT	CONC.
981021-14	******	Unknown m/z = 69	05.23	10 T
	******	Unknown m/z = 45	05.44	2 T
	******	Unknown m/z = 41	06.11	9 T

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

FY 74004
REQ 99010

CHAIN OF CUSTODY RECORD

Shelf 8 E+F

REGION 3
841 Chestnut St.
Philadelphia, Pennsylvania 19107

PROJ. NO. 4645 | PROJECT NAME: Wilmington Drum

SAMPLERS: (Signature) [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	VOA	[illegible]	[illegible]				REMARKS
													TAG numbers
SD-01	10/20/98	1540		X	SD-01 98102101	3	1	1	1				3-224418 to 3-224420
SD-02		1100		X	SD-02 98102102	3	1	1	1				3-2215309 to 3-221531
SD-03		1130		X	SD-03 98102103	3	1	1	1				3-2215312 to 3-2215314
SD-06		1300		X	SD-06 98102104	3	1	1	1				3-2215321 to 3-2215323
SD-05		1000		X	SD-05 98102105	3	1	1	1				3-2215318 to 3-2215320
SD-04		1230		X	SD-04 98102106	3	1	1	1				3-2215306 to 3-2215308
SD-04		1230		X	SD-04 98102106	3	1	1	1				3-2215324 to 3-2215326 *
SD-04	10/20/98	1230		X	SD-04 98102106	3	1	1	1				3-2215315 to 3-2215317 *
													* For MS/MSD
					Temperature Indicator								

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/20/98 1500				

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
		[signature]	10/21/98 9:05	Air Bill # 8086562494403

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AR100052

3 06548

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

REGION 3
841 Chestnut St.
Philadelphia, Pennsylvania 19107

CHAIN OF CUSTODY RECORD

PROJ. NO.: 4645
PROJECT NAME: Wilmington [illegible]

SAMPLERS: (Signature) [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA [illegible]	[illegible]	[illegible]	[illegible]			REMARKS
													TAs [illegible]
TB-1	6/14/96	0900		X	TB-1 98102109#	3	3						1-2224422 to 1-2224424
FB-1	6/14/96	Noon		x	FB-1 98102110#	9	3	4	1	1			1-2224415 to 1-2224423
					Temperature indicator								

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	6/20/96 14:20				
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: AIR Bill # 8086562449?6	

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AR100053

3 06545

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

REGION 3
841 Chestnut St.
Philadelphia, Pennsylvania 19107

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
4645	Wilmington Drum

SAMPLERS: *(Signature)* [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA (HCL pres)	Pest/PCB/SVOAs	Metals (HNO3)	Cyanide (NaOH)			REMARKS
													TAG numbers
SW-04	10/14/98	1230		X	SW-04 981021#4	8		8					3-221495 to 3-221562 *
SW-04	|	1230		X	SW-04 981021#4	9	3	4	1	1			3-2215233 to 3-2215240
SW-04	|	1230		X	SW-04 981021#4	8	6		1	1			3-2215207 to 3-2215214 *
SW-04	|	1230		X	SW-04 981021#4	2			1	1			3-2215217 to 3-2215268 *
SW-06	10/14/98	1100		X	SW-06 981021#10	9	3	4	1	1			3-2215251 to 3-2215-45
					Temperature indicator								
													*For MS/MSD

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Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
				Air Bill # 8086562244414

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AR100054

3 06547

Office of Enforcement

CHAIN OF CUSTODY RECORD

REGION 3
841 Chestnut St.
Philadelphia, Pennsylvania 19107

PROJ. NO.: 4645
PROJECT NAME: [illegible]
SAMPLERS: (Signature) [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	VOA	[illegible]	[illegible]	[illegible]			REMARKS
													TAG numbers
SW-01	[illegible]	1540		X	SW-01 9810214[illegible]	9	3	4	1	1			3-2215260 to 3-2215266 3-[illegible] 3-[illegible]
SW-02	[illegible]	1100		X	SW-02 9810214[illegible]	9	3	4	1	1			3-2215215 to 3-221223
SW-03	[illegible]	1130		X	SW-03 9810214[illegible]	9	3	4	1	1			3-2215224 to 3-2215232
SW-05	[illegible]	1000		X	SW-05 9810214[illegible]	9	3	4	1	1			3-2215242 to 3-2215250
					Temperature indicator								

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
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: AIR Bill # 8086562444[illegible]	

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AR100055

3 06546

Notice to Laboratory Personnel

Background

Under the authority of Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) of 1980, Section 311 of the Clean Water Act, and Subtitle I of the Resource Conservation and Recovery Act (RCRA), EPA has been delegated the responsibility to undertake response actions with respect to the release or potential release of oil, petroleum, or hazardous substances that pose a substantial threat to human health or welfare, or the environment. In addition, EPA provides technical assistance to help mitigate endangerment of the public health, welfare or environment during other emergencies and natural disasters.

EPA's successful implementation of these emergency response action responsibilities requires that technical support capabilities be provided in the form of contracted Technical Assistance Teams (TAT) for each EPA Region. The WESTON TAT Contract 68-WO-0036 provides support to EPA Regions I, II, III, IV, ERT - Edison, and Headquarters - Washington,DC.

Hazard Communication

The samples which accompany this notice have been shipped to your laboratory for analysis in accordance with applicable D.O.T. or IATA Regulations and were collected by the WESTON TAT and were tentatively designated by the field response team as either environmental or hazardous material samples.

In general, *Environmental Samples* are collected from streams, farm ponds, small lakes, wells, and off-site soils that are not reasonably expected to be contaminated with hazardous materials. Samples of on-site soils or water, and materials collected from drums, bulk storage tanks, obviously contaminated ponds, impoundments, lagoons, pools, and leachates from hazardous waste sites are considered *Hazardous Samples*. Samples which are obtained from a known radioactive material contamination site or which demonstrate beta or gamma activity greater than three times average background as scanned with a Geiger-Mueller radiation survey meter are considered *Radioactive Samples*.

The samples which accompany this notice have been tentatively classified by the field response team as:

X Environmental ______ Hazardous ______ Comb. (Envir.& Haz.) ______ Radioactive

The field team which collected the samples used the following Level(s) of personal protection as designated by EPA and OSHA conventions to provide protection against possible radiological or chemical exposure:

______ Level A ______ Level B ______ Level C X Level D

This information is intended for use as a guide for the safe handling of these laboratory samples in accordance with EPA and OSHA regulations. The sample classification(s) and Levels of personal protection used by the WESTON TAT are not represented to be, nor are they adequate or applicable in all situations, nor are they intended to serve as substitutes for professional/personal judgement.

This form was prepared by: Kevin B[illegible] 10/20/98

Analytical Services TDD No. [illegible] Date 10/20/98

WESTON Office Delran, NJ Phone 609-461-4003 FAX 609-461-[illegible]

Laboratory Name USEPA Region III Lab

AR100056

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