BENCH-SCALE TREATABILITY STUDY REPORT FOR DECONTAMINATING DREDGED ESTUARINE SEDIMENTS

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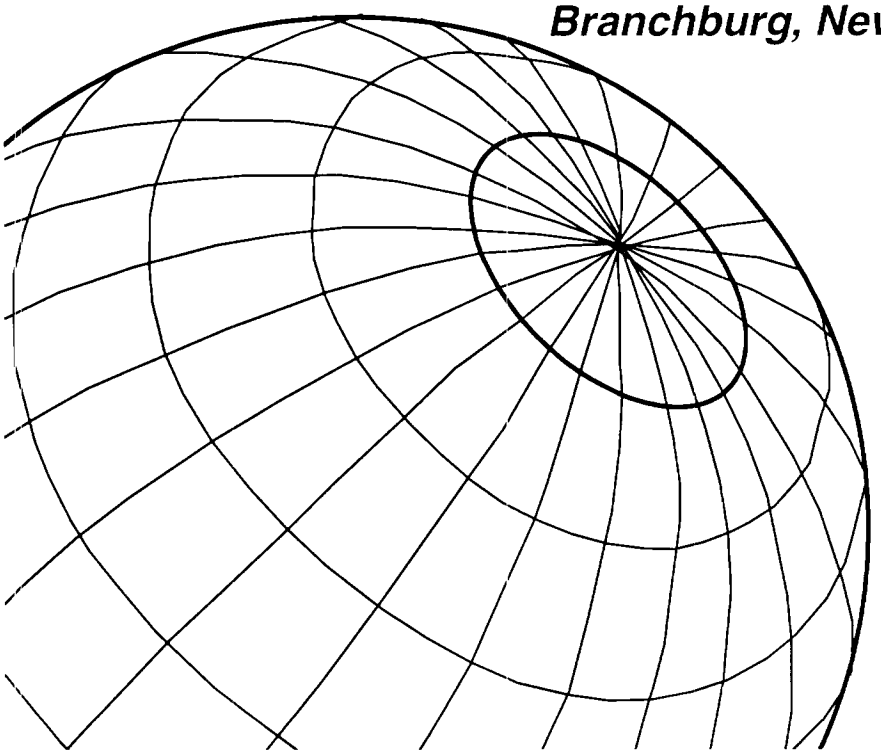

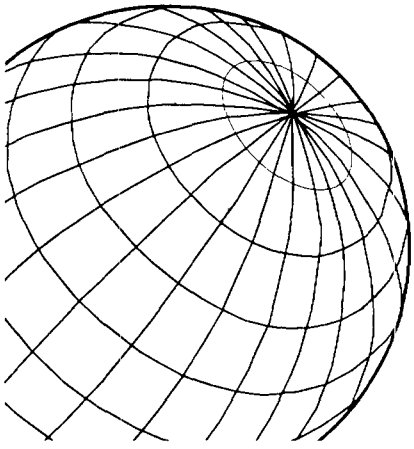

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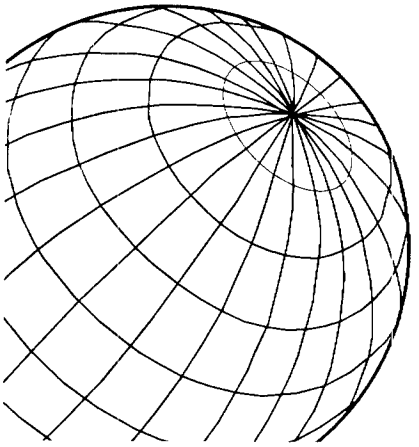


EXECUTIVE SUMMARY

Under contract with Brookhaven National Laboratory (BNL), Metcalf & Eddy (M&E) has completed bench-scale treatability tests to evaluate its proprietary technologies to treat contaminated dredged sediment. This report describes the test program and results and incorporates the analytical results of test samples submitted to BNL.

Objectives

The objectives of the bench-scale test were:

- ❑ to demonstrate the feasibility of decontaminating the dredged estuarine sediments from Newtown Creek, which is representative of sediment from various areas of the New York and New Jersey Harbor system;
- ❑ to produce useful, recyclable end-products; and
- ❑ to optimize and determine process information for the operation of a pilot plant and generate design information for operating and capital costs for large-scale production plants.

Technologies

The three sequential Integrated Sediment Decontamination System (ISDS) technologies are:

- ❑ HYDRO-SEP℠: a soil washing process to produce clean, larger-size fractions and reduce the quantity to be treated by downstream operations;
- ❑ ORG-X℠: a solvent extraction process to remove organic contaminants; and
- ❑ SOLFIX℠: a solidification/stabilization process for reducing the leaching properties for inorganic contaminants and for improving strength and erosion properties of the end-products.

The integration of the three technologies effectively allows the treatment of sediment feedstocks with different physical and/or chemical characteristics. The harbor sediments are usually contaminated to various degrees with heavy metals, pesticides, polycyclic aromatic hydrocarbons (tar, oil, fuels), polychlorinated biphenyls, dioxins, and furans. In the past, the dredged sediment was disposed in the ocean. Presently, however, more stringent testing requirements and recent regulations have significantly reduced the amount of sediment for ocean disposal. The remainder will soon require remedial solutions on a large, industrial scale.

Bench-Scale Tests by Generale de Rehabilitation des Sites (GRS)

The bench-scale tests conducted at the GRS facility in Paris, France, were completed for:

- ❑ the ORG-X℠ process;
- ❑ the SOLFIX℠ process to directly stabilize the raw sediment; and
- ❑ the SOLFIX℠ process to stabilize the ORG-X℠ product.

The HYDRO-SEP℠ washing tests were not performed as the sediment contained less than 0.4 percent of material greater than 2mm, on the low side of the expected 0.1 - 34.4 percent range for the Newtown Creek sediment.

ORG-X and SOLFIX Process Results

The results are very encouraging as the ORG-X℠ process significantly reduces the undesirable organic contaminants and the SOLFIX℠ process stabilizes and solidifies the material into useful products.

ORG-X Process: The ORG-X℠ process reduced the organics as follows using three countercurrent solvent extraction stages:

GRS Results

❑ Light hydrocarbons (up to C_{18})	99.9%
❑ Medium-weight hydrocarbons	86%
❑ Total hydrocarbons	91%
❑ Heavy hydrocarbons	92%
❑ Residual carbon	37%
❑ Total organic carbon	30%

BNL Results

❑ PCBs (total)	79 - 92%
❑ Pesticides	94 - 98%
❑ Chlorinated herbicides	See note a
❑ Semi-volatile organics	47 - 91%
❑ Dioxins	See note b
❑ Furans	See note b

Notes:

a) Not calculable but significant amount in spent solvent. See Section 4 for explanation.

b) Not meaningful because most figures were low and less than the Minimum Detection Limit (MDL). See Section 4 for explanation.

Sometimes the percent removal could not be calculated because the concentration was below the minimum detection limit for both the new sediment and the product, or because the input and output materials did not balance when the concentrations and accuracy were very low. For example, the spent solvent contained 61 - 84 % of the initial total dioxin/ furan groups.

M&E did not have the benefit of the BNL analytical results during the bench-scale tests. M&E strongly believes the percent removal of most contaminants can be increased with inexpensive process improvements during the pilot phase. The recommended operational changes are:

- ❑ Use continuous countercurrent extraction with more than three stages;
- ❑ Use warm/hot recycle solvent;
- ❑ Use a higher solvent-to-sediment ratio; and
- ❑ Use a mixture of closely related solvents with the same equipment.

SOLFIX Process: The SOLFIX℠ process produced solid products of a desirable unconfined compressive strength (UCS) at low reasonable reagent/additive costs. The solid product also exhibits lower permeability and higher erosion resistance than the soil/sediment product from ORG-X℠. The mixture quantities can be varied and accelerators can be added to attain other desirable features, such as a less stronger material that cures quickly at mimimum cost. The results are summarized below:

	UCS by GRS	*UCS by BNL*
Direct SOLFIX℠ product	728 psi	102 psi
ORG-X℠ plus SOLFIX℠ product	600 psi	487 psi

The leaching properties were very low for both the raw sediment as well as the three products produced by the study. The TCLP results for PCBs were significantly less for the ORG-X℠ product. The reduction range was 45% to >99% for the individual and group totals.

Both the ORG-X℠ and SOLFIX℠ processes have been sufficiently adapted to continue with the pilot plant program. This report contains process block diagrams, material balances, process study, and project management information.

Costs and Commercialization

The operating costs were also estimated for continuous production plants with state-of-the-art process control. The costs are tabulated below for the three different process combinations that would be applicable depending on physical characteristics, removal of organics and/or metals, and production capacity.

Process	Production-Scale Plant (100,000 cy/yr)	Full-Scale Plant (500,000 cy/yr)
HYDRO-SEP and SOLFIX	$54 / cy	$32 / cy
HYDRO-SEP and ORG-X	$64 / cy	$31 / cy
HYDRO-SEP, ORG-X and SOLFIX	$80 / cy	$42 / cy

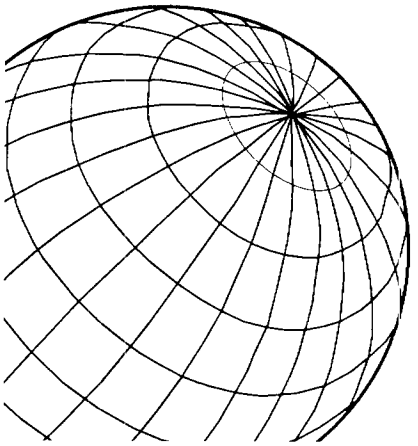
Notes:

1. HYDRO-SEP separates and treats oversize particles estimated at 10% of raw sediment. The other 90% is treated by the subsequent process(es).

2. Organic waste product does not contain regulated dioxin quantities. Add $40/cy to incinerate at $2.00/lb, if regulated.

The ultimate development of a full-scale decontamination facility will probably require private/public partnering to provide adequate funding and a willing host community for a site. Other key factors involved in the full-scale project are:

- Provision of a reliable dredged material supply;
- Characterization of the quantity, physical and chemical characteristics of the supply to allow for a realistic estimate of the processing cost;
- Specification s and criteria for use of recycled material; and
- Incentives for creating an end-market for recycled materials.



SECTION 1.0

INTRODUCTION

Metcalf & Eddy (M&E) and its sister company, Generale de Rehabilitation des Sites (GRS) have completed this bench-scale treatability report after receipt of the BNL analytical results on March 20 and April 2, 1996 (see Appendix A-1). The work was described in and performed in accordance with the Work Plan submitted October 4, 1995 and subsequently approved by BNL. The bench-scale work was successfully conducted at the GRS laboratory in Paris and the required samples were sent to BNL with a letter dated January 15, 1996. A delegation of BNL representatives visited the GRS laboratory in December 1995.

1.1 PROJECT DESCRIPTION

Sediments from the New York/New Jersey Harbor areas are dredged routinely to maintain navigable water depths for shipping channels and berthing areas to facilitate commerce and safe navigation. Historically, the dredged materials was disposed in the ocean. However, ocean disposal has been restricted due to greater regulatory restrictions on contaminant concentrations in the dredged sediments. The dredged sediments typically contain elevated levels of metals, polynuclear aromatic hydrocarbons (PAHs) (tars, oils, fuels) polychlorinated biphenyls (PCBs), chlorinated pesticides and herbicides, dioxins (PCDDs), and furans (PCDFs) as shown in Table 1-1 [1] for Newtown Creek. Table 1-1, included at the end of this section, lists both the range previously available from the Request for Proposal and the average of six samples available to date for the treatability studies. The actual sediment used for the test was a black mayonnaise-like paste that contained few particles (or 0.2% on dry basis) greater than 2 mm, and exhibited an oily, foul odor.

BNL and other governmental federal and state agencies are in the process of developing risk-based and/or specific clean-up standards for the various locations where the treated sediment products are to be used. These standards are likely to be related to the soil clean-up criteria used based on direct soil contact (residential and non-residential) and/or impact to groundwater. For example, Appendix A contains the current soil clean-up criteria used by the State of New Jersey and the Maximum Concentration of Contaminants for the Toxicity Characteristic. Based on the sediment from Newtown Creek and the soil clean-up criteria for direct soil contact, some contaminants already meet the clean-up criteria while some need up to one or two orders-of-magnitude removal. The TCLP values for the Newtown Creek sediment are below the maximum toxicity characteristic value.

Section 405 of the Water Resources and Development Act of 1992 has authorized evaluation of technologies for decontaminating dredged sediments and/or potential reuse of the treated materials. Accordingly, the Brookhaven National Laboratory (BNL), in support of the U.S. Army Corps of Engineers, New York District (COE-NYD), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy (DOE) contracted Metcalf & Eddy and six other contractors to perform bench-scale treatability studies to identify cost-effective remedial alternatives for decontamination of the dredged sediments.

Metcalf & Eddy (M&E) performed bench-scale treatability tests using the Newtown Creek sediments to demonstrate the effectiveness of its proprietary technologies for decontaminating the dredged sediments. M&E tested its SOLFIX stabilization and solidification technology on the raw dredged

sediment alone as well as in conjunction with the organics removal technology via solvent extraction (ORG-X) as potential remedial alternatives for the dredged sediments. Those technologies that demonstrate successful treatment and are economical will continue with the pilot testing program. Metcalf & Eddy submitted a proposal on March 15, 1996 for this and follow-up work.

1.2 TREATABILITY STUDY OBJECTIVES

The objectives of the bench-scale treatability study were:

- Determination of the site-specific effectiveness of the Solidification/Stabilization (SOLFIX) processes, and the solvent extraction (ORG-X) process alone and in conjunction with the SOLFIX process in treating the sediment sample to facilitate reuse of products.
- Development of the design basis and operating requirements for the pilot-scale operation.
- Optimization of the process parameters such that preliminary and/or order-of-magnitude cost estimates for the production and full-scale production plants could be developed.

BNL determined the process effectiveness by doing a full complement of analysis of the treated end-products as well as any side streams and residues.

According to the QAPP, the analyses evaluated the "reduction in sediment contamination and, if appropriate, whether the post-treatment material passes sediment toxicity, Toxic Characteristic Leaching Potential (TCLP)." Also, the physical test for unconfined compressive strength (UCS) was done on end-products. These laboratory results, as well as process data, were used to generate material balances for the three processes, to make any modifications to the treatment technologies and to perform an economic analysis.

M&E decided not to test its other proprietary stabilization process (ECOFIX) because the quantity of organics was too high.

1.3 DESCRIPTION OF CONTENTS IN SUBSEQUENT SECTIONS

Section 2 presents a description of the technologies and proposed Integrated Sediment Decontamination System, which has three main process trains. Section 3 summarizes the experiment design and procedures for the bench-scale tests. Section 4 presents the results for each of the three process trains. Section 5 presents preliminary order-of-magnitude capital and operating costs for the proposed production and full-scale plants of 100,000 cy/yr and 500,000 cy/yr, respectively. Section 6 presents the proposed pilot plant process for demonstrating the feasibility with 25 cy or raw sediment, as was submitted with the proposal.

Table 1-1
Physical / Chemical Characteristics of Newtown Creek Sediment

Item	Method	Units	Mean	Item	Proposal Range
Particle size	ASTM D422 (Mod)				
Medium gravel > 4.75 mm	ASTM D422 (Mod)	% wt (dry)	0.04		
Fine gravel 2-4 75	ASTM D422 (Mod)	% wt (dry)	0.38	Gravel	0.1-34.4
V. coarse sand 0.85-2	ASTM D422 (Mod)	% wt (dry)	0.83		
Coarse sand 0.425-0.85	ASTM D422 (Mod)	% wt (dry)	2.15		
Medium sand 0.24-0.425	ASTM D422 (Mod)	% wt (dry)	5.05	Sand	35.1-47.2
Fine sand 0.106-0.24	ASTM D422 (Mod)	% wt (dry)	9.57		
V. fine sand 0.075-0.106	ASTM D422 (Mod)	% wt (dry)	2 80		
Clay	ASTM D422 (Mod)	% wt (dry)	35.57	Clay	10.2-21.5
Silt	ASTM D422 (Mod)	% wt (dry)	44.95	Silt	8.2-43.4
pH	EPA 9045A	pH units	7.90		7.38-7.76
Solids (total)	EPA 160.3	% wt (dry)	33.05		
Sulfides (total)	EPA 9030M	mg/kg (dry)	7833.33		4,850
Organic carbon (total)	ASTM D4129-82M	% wt (dry)	7 32		2.3-7.9

Metals	Method	Units	Mean	Item	Proposal Range
Ag	EPA 6010A	mg/kg (dry)	18.42		2-3
As	EPA 6010A	mg/kg (dry)	33.48		5-33
Be	EPA 6010A	mg/kg (dry)	< 0.56		
Cd	EPA 6010A	mg/kg (dry)	37.05		1-20
Cr	EPA 6010A	mg/kg (dry)	376.67		305
Cu	EPA 6010A	mg/kg (dry)	1171 67		61-770
Ni	EPA 6010A	mg/kg (dry)	297.17		12-140
Pb	EPA 6010A	mg/kg (dry)	617.00		68-554
Sb	EPA 6010A	mg/kg (dry)	10.29		
Se	EPA 6010A	mg/kg (dry)	3.24		
Tl	EPA 6010A	mg/kg (dry)	< 2.77		
Zn	EPA 6010A	mg/kg (dry)	1725.00		104-1,260
Hg (Total)	EPA 7471	mg/kg (dry)	1.29		1-3

Polychlorinated Biphenyls	Method	Units	Mean
PCBs:	EPA MM680/HRGC/MS	ug/kg (dry)	
2-Mono	Congenor #1	ug/kg (dry)	57.33
44'-Di	#15	ug/kg (dry)	64.67
244'-Tri	#28	ug/kg (dry)	168.17
22'55'-Tetra	#52	ug/kg (dry)	269.33
33'44'-Tetra	#77	ug/kg (dry)	13.83
2344'5-Penta	#118	ug/kg (dry)	6.00
233'44'-Penta	#105	ug/kg (dry)	66.67
33'44'5-Penta	#126	ug/kg (dry)	0.50
233'44'5-Hexa	#156	ug/kg (dry)	17.12
33'44'55'-Hexa	#169	ug/kg (dry)	< 0.00
22'344'55'-Hepta	#180	ug/kg (dry)	73.37
22'33'44'55'-Octa	#194	ug/kg (dry)	17.10
22'33'44'55'6-Nona	#206	ug/kg (dry)	11.93
Deca	#209	ug/kg (dry)	7.20

Table 1-1
Physical / Chemical Characteristics of Newtown Creek Sediment

Polychlorinated Biphenyls	Method	Units	Mean
PCB Totals:			
-Mono	EPA MM680/HRGC/MS	ug/kg (dry)	108.62
-Di	EPA MM680/HRGC/MS	ug/kg (dry)	379.33
-Tri	EPA MM680/HRGC/MS	ug/kg (dry)	727.83
-Tetra	EPA MM680/HRGC/MS	ug/kg (dry)	1588.33
-Penta	EPA MM680/HRGC/MS	ug/kg (dry)	1236.67
-Hexa	EPA MM680/HRGC/MS	ug/kg (dry)	808.33
-Hepta	EPA MM680/HRGC/MS	ug/kg (dry)	294.50
-Octa	EPA MM680/HRGC/MS	ug/kg (dry)	95.83
-Nona	EPA MM680/HRGC/MS	ug/kg (dry)	20.38

Chlorinated Pesticides and Herbicides	Method	Units	Mean
Pesticides (Cl)			
a-BHC	EPA 8080	ug/kg (dry)	< 14.47
a-Chlordane	EPA 8080	ug/kg (dry)	< 14.47
Aldrin	EPA 8080	ug/kg (dry)	75.02
beta-BHC	EPA 8080	ug/kg (dry)	< 14.47
delta-BHC	EPA 8080	ug/kg (dry)	< 14.47
4,4'-DDD	EPA 8080	ug/kg (dry)	162.10
4,4'-DDE	EPA 8080	ug/kg (dry)	160.57
4,4'-DDT	EPA 8080	ug/kg (dry)	< 28.90
Dieldrin	EPA 8080	ug/kg (dry)	74.45
Endrin	EPA 8080	ug/kg (dry)	< 28.90
Endrin aldehyde	EPA 8080	ug/kg (dry)	< 28.90
Endosulfan I	EPA 8080	ug/kg (dry)	< 14.47
Endosulfan II	EPA 8080	ug/kg (dry)	< 28.90
Endosulfan sulfate	EPA 8080	ug/kg (dry)	< 28.90
g-BHC (Lindane)	EPA 8080	ug/kg (dry)	< 14.47
g-Chlordane	EPA 8080	ug/kg (dry)	< 14.47
Heptachlor	EPA 8080	ug/kg (dry)	< 14.47
Heptachlor epoxide	EPA 8080	ug/kg (dry)	< 14.47
Methoxychlor	EPA 8080	ug/kg (dry)	< 144.53
Toxaphene	EPA 8080	ug/kg (dry)	< 1445.15
Chlorinated Herbicides			
2,4-D	EPA 8150A (Mod)	mg/kg (dry)	< 0.20
2,4,5-TP (Silvex)	EPA 8150A (Mod)	mg/kg (dry)	< 0.05
2,4,5-T	EPA 8150A (Mod)	mg/kg (dry)	< 0.05

Table 1-1
Physical / Chemical Characteristics of Newtown Creek Sediment

Semi-Volatile Organics (including PAHs)	Method	Units	Mean
Phenol	EPA 8270A	ug/kg (dry)	638.00
bis(2-Chloroethyl)ether	EPA 8270A	ug/kg (dry)	< 754.50
2-Chlorophenol	EPA 8270A	ug/kg (dry)	< 691 67
1,3-Dichlorobenzene	EPA 8270A	ug/kg (dry)	< 507.33
1,4-Dichlorobenzene	EPA 8270A	ug/kg (dry)	< 517.00
1,2-Dichlorobenzene	EPA 8270A	ug/kg (dry)	< 573.67
Benzyl alcohol	EPA 8270A	ug/kg (dry)	< 1378.33
2,2'-oxybis(1-Chloropropane)	EPA 8270A	ug/kg (dry)	< 864 17
2-Methylphenol	EPA 8270A	ug/kg (dry)	< 875.60
3/4-Methylphenol	EPA 8270A	ug/kg (dry)	1389.67
N-Nitroso-di-n-propylamine	EPA 8270A	ug/kg (dry)	1091.50
Hexachloroethane	EPA 8270A	ug/kg (dry)	< 1243.83
Nitrobenzene	EPA 8270A	ug/kg (dry)	< 570.83
Isophorone	EPA 8270A	ug/kg (dry)	< 334.33
2-Nitrophenol	EPA 8270A	ug/kg (dry)	< 1054.67
2,4-Dimethylphenol	EPA 8270A	ug/kg (dry)	< 717.17
bis(2-Chloroethoxy)methane	EPA 8270A	ug/kg (dry)	< 631.83
Benzoic acid	EPA 8270A	ug/kg (dry)	< 1335 17
2,4-Dichlorophenol	EPA 8270A	ug/kg (dry)	< 684.33
1,2,4-Trichlorobenzene	EPA 8270A	ug/kg (dry)	< 623.17
Naphthalene	EPA 8270A	ug/kg (dry)	2726.67
4-Chloroaniline	EPA 8270A	ug/kg (dry)	1002.83
Hexachlorobutadiene	EPA 8270A	ug/kg (dry)	< 711.33
4-Chloro-3-methylphenol	EPA 8270A	ug/kg (dry)	< 839.17
2-Methylnaphthalene	EPA 8270A	ug/kg (dry)	2304.00
Hexachlorocyclopentadiene	EPA 8270A	ug/kg (dry)	< 668.33
2,4,6-Trichlorophenol	EPA 8270A	ug/kg (dry)	< 843.17
2,4,5-Trichlorophenol	EPA 8270A	ug/kg (dry)	< 798.00
2-Chloronaphthalene	EPA 8270A	ug/kg (dry)	< 369.67
2-Nitroaniline	EPA 8270A	ug/kg (dry)	< 1092 17
Dimethylphthalate	EPA 8270A	ug/kg (dry)	< 312.17
2,6-Dinitrotoluene	EPA 8270A	ug/kg (dry)	< 1388.00
2,4-Dinitrotoluene	EPA 8270A	ug/kg (dry)	< 1011.83
Acenapthylene	EPA 8270A	ug/kg (dry)	1288.50
3-Nitroaniline	EPA 8270A	ug/kg (dry)	< 1350.53
Acenaphthene	EPA 8270A	ug/kg (dry)	1042.33
2,4-Dinitrophenol	EPA 8270A	ug/kg (dry)	< 2467.33
4-Nitrophenol	EPA 8270A	ug/kg (dry)	1618.17
Dibenzofuran	EPA 8270A	ug/kg (dry)	1172.00
Diethylphthalate	EPA 8270A	ug/kg (dry)	< 276.17
4-Chlorophenyl-phenylether	EPA 8270A	ug/kg (dry)	< 540.33
Fluorene	EPA 8270A	ug/kg (dry)	1369.17
4-Nitroaniline	EPA 8270A	ug/kg (dry)	< 1319.00
4,6-Dinitro-2-methylphenol	EPA 8270A	ug/kg (dry)	< 1731.33
N-Nitrosodiphenylamine	EPA 8270A	ug/kg (dry)	< 566.50
4-Bromophenyl-phenylether	EPA 8270A	ug/kg (dry)	< 1016.17
Hexachlorobenzene	EPA 8270A	ug/kg (dry)	< 779.00
Pentachlorophenol	EPA 8270A	ug/kg (dry)	< 1038 83

Table 1-1
Physical / Chemical Characteristics of Newtown Creek Sediment

Semi-Volatile Organics (Including PAHs)	Method	Units	Mean
Phenanthrene	EPA 8270A	ug/kg (dry)	6586.00
Anthracene	EPA 8270A	ug/kg (dry)	3702.17
Di-n-butyl phthalate	EPA 8270A	ug/kg (dry)	1226.60
Fluoranthene	EPA 8270A	ug/kg (dry)	10323.67
Pyrene	EPA 8270A	ug/kg (dry)	7101.67
Butylbenzylphthalate	EPA 8270A	ug/kg (dry)	1473 17
3,3'-Dichlorobenzidine	EPA 8270A	ug/kg (dry)	< 287.67
bis-2-ethylhexylphthalate	EPA 8270A	ug/kg (dry)	48630.83
Benzo(a)anthracene	EPA 8270A	ug/kg (dry)	4484.17
Chrysene	EPA 8270A	ug/kg (dry)	4584.33
Di-n-octylphthalate	EPA 8270A	ug/kg (dry)	
Benzo(b)fluoranthene	EPA 8270A	ug/kg (dry)	2922 17
Benzo(k)fluoranthene	EPA 8270A	ug/kg (dry)	1107.33
Benzo(a)pyrene	EPA 8270A	ug/kg (dry)	2550.83
Indeno(123-cd)pyrene	EPA 8270A	ug/kg (dry)	1075.67
Dibenz(a,h)anthracene	EPA 8270A	ug/kg (dry)	397.00
Benzo(ghi)perylene	EPA 8270A	ug/kg (dry)	1254.33
Benzo(e)pyrene	EPA 8270A	ug/kg (dry)	2125.50
Perylene	EPA 8270A	ug/kg (dry)	948.50

Dioxins and Furans	Method	Units	Mean
2378-TCDD	EPA 8290	ng/kg (dry)	41.52
12378-PeCDD	EPA 8290	ng/kg (dry)	60.15
123478-HxCDD	EPA 8290	ng/kg (dry)	49.22
123678-HxCDD	EPA 8290	ng/kg (dry)	141.67
123789-HxCDD	EPA 8290	ng/kg (dry)	133.60
1234678-HpCDD	EPA 8290	ng/kg (dry)	2091.67
OCDD	EPA 8290	ng/kg (dry)	17463.33
2378-TCDF	EPA 8290	ng/kg (dry)	340.00
12378-PeCDF	EPA 8290	ng/kg (dry)	310.83
23478-PeCDF	EPA 8290	ng/kg (dry)	146.40
123478-HxCDF	EPA 8290	ng/kg (dry)	1303.33
123678-HxCDF	EPA 8290	ng/kg (dry)	464.00
234678-HxCDF	EPA 8290	ng/kg (dry)	186.00
123789-HxCDF	EPA 8290	ng/kg (dry)	23.23
1234678-HpCDF	EPA 8290	ng/kg (dry)	4966.33
1234789-HpCDF	EPA 8290	ng/kg (dry)	110.52
OCDF	EPA 8290	ng/kg (dry)	4418.33
Totals: Dioxins			
-TCDD	EPA 8290	ng/kg (dry)	246 10
-PeCDD	EPA 8290	ng/kg (dry)	378.17
-HxCDD	EPA 8290	ng/kg (dry)	1370.00
-HpCDD	EPA 8290	ng/kg (dry)	4450.00
Totals: Furans			
-TCDF	EPA 8290	ng/kg (dry)	2371.67
-PeCDF	EPA 8290	ng/kg (dry)	2853.33
-HxCDF	EPA 8290	ng/kg (dry)	5175.00
-HpCDF	EPA 8290	ng/kg (dry)	6068.33

Table 1-1
Physical / Chemical Characteristics of Newtown Creek Sediment

TCLP Metals	Method	Units	Mean
-Arsenic	EPA 1311/3010/6010A	mg/L (extract)	< 0 10000
-Barium	EPA 1311/3010/6010A	mg/L (extract)	< 0.50000
-Cadmium	EPA 1311/3010/6010A	mg/L (extract)	< 0.01000
-Chromium	EPA 1311/3010/6010A	mg/L (extract)	0.02833
-Lead	EPA 1311/3010/6010A	mg/L (extract)	< 0.05000
-Mercury	EPA 1311/7470	mg/L (extract)	< 0.00100
-Selenium	EPA 1311/3010/6010A	mg/L (extract)	< 0.10000
-Silver	EPA 1311/3010/6010A	mg/L (extract)	< 0.01000

Organo-Cl Pesticides/ and Herbicides (TCLP)	Method	Units	Mean
Organo-Cl Pesticides			
-Chlordane	EPA 1311/8080	mg/L (extract)	< 0.00500
-Endrin	EPA 1311/8080	mg/L (extract)	< 0.00050
-Heptachlor	EPA 1311/8080	mg/L (extract)	< 0.00050
-Heptachlor epoxide	EPA 1311/8080	mg/L (extract)	< 0 00050
-Lindane (g-BHC)	EPA 1311/8080	mg/L (extract)	< 0.00050
-Methoxychlor	EPA 1311/8080	mg/L (extract)	< 0.00100
-Toxaphene	EPA 1311/8080	mg/L (extract)	< 0.01000
Cl Herbicides (TCLP)			
-2,4-D	EPA 1311/8150A (Mod)	mg/L (extract)	< 0.10000
-2,4,5-TP (Silvex)	EPA 1311/8150A (Mod)	mg/L (extract)	< 0 01000

Volatile Organics (TCLP)	Method	Units	Mean
-Benzene	EPA 1311/8240A	mg/L (extract)	< 0 20000
-Carbon tetrachloride	EPA 1311/8240A	mg/L (extract)	< 0.20000
-Chlorobenzene	EPA 1311/8240A	mg/L (extract)	< 0.20000
-Chloroform	EPA 1311/8240A	mg/L (extract)	< 0.20000
-1,4-Dichlorobenzene	EPA 1311/8240A	mg/L (extract)	< 0.20000
-1,2-Dichloroethane	EPA 1311/8240A	mg/L (extract)	< 0.20000
-1,1-Dichloroethene	EPA 1311/8240A	mg/L (extract)	< 0 20000
Methyl ethyl ketone	EPA 1311/8240A	mg/L (extract)	< 5.00000
Tetrachloroethene	EPA 1311/8240A	mg/L (extract)	< 0.20000
Trichloroethene	EPA 1311/8240A	mg/L (extract)	< 0.20000
Vinyl chloride	EPA 1311/8240A	mg/L (extract)	< 0.10000

Semi-Volatiles (TCLP)	Method	Units	Mean
-Hexachloroethane	EPA 1311/8270A	mg/L (extract)	< 0.10000
-Nitrobenzene	EPA 1311/8270A	mg/L (extract)	< 0.10000
-Hexachlorobutadiene	EPA 1311/8270A	mg/L (extract)	< 0.10000
-2,4-Dinitrotoluene	EPA 1311/8270A	mg/L (extract)	< 0.10000
-Hexachlorobenzene	EPA 1311/8270A	mg/L (extract)	< 0.10000
-2,4,6-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	< 0.10000
-2,4,5-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	< 0.10000
-Pentachlorophenol	EPA 1311/8270A	mg/L (extract)	< 0.25000
-Pyridine	EPA 1311/8270A	mg/L (extract)	< 0.25000
-o-Cresol	EPA 1311/8270A	mg/L (extract)	< 0.10000
-m,p-Cresols	EPA 1311/8270A	mg/L (extract)	< 0.10000
-Total Cresols	EPA 1311/8270A	mg/L (extract)	< 0.10000

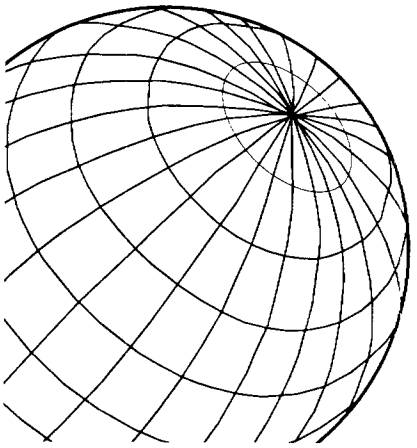
Table 1-1
Physical / Chemical Characteristics of Newtown Creek Sediment

PAHs (TCLP)	Method	Units	Mean
Naphthalene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
2-Methylnaphthalene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Acenapthylene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Acenaphthene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Dibenzofuran	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Fluorene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Phenanthrene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Benzo(a)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Chrysene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Benzo(b)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Benzo(k)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Benzo(a)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Indeno(123-cd)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Dibenz(a,h)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000
Benzo(ghi)perylene	EPA 1311/8270A (Mod)	mg/L (extract)	< 0.10000

Dioxins/Furans (TCLP)	Method	Units	Mean
2378-TCDD	EPA 8290	ng/L (extract)	< 0.00317
12378-PeCDD	EPA 8290	ng/L (extract)	< 0.00717
123478-HxCDD	EPA 8290	ng/L (extract)	< 0.00700
123678-HxCDD	EPA 8290	ng/L (extract)	< 0.00600
123789-HxCDD	EPA 8290	ng/L (extract)	< 0.00617
1234678-HpCDD	EPA 8290	ng/L (extract)	0.00867
OCDD	EPA 8290	ng/L (extract)	0 03033
2378-TCDF	EPA 8290	ng/L (extract)	< 0.00233
12378-PeCDF	EPA 8290	ng/L (extract)	< 0.00417
23478-PeCDF	EPA 8290	ng/L (extract)	< 0.00400
123478-HxCDF	EPA 8290	ng/L (extract)	0.00533
123678-HxCDF	EPA 8290	ng/L (extract)	< 0.00317
234678-HxCDF	EPA 8290	ng/L (extract)	0 00467
123789-HxCDF	EPA 8290	ng/L (extract)	< 0.00467
1234678-HpCDF	EPA 8290	ng/L (extract)	0.00925
1234789-HpCDF	EPA 8290	ng/L (extract)	< 0.00650
OCDF	EPA 8290	ng/L (extract)	< 0.00883
Totals: Dioxins			
-TCDD	EPA 8290	ng/L (extract)	< 0.00317
-PeCDD	EPA 8290	ng/L (extract)	< 0.00717
-HxCDD	EPA 8290	ng/L (extract)	< 0.00617
-HpCDD	EPA 8290	ng/L (extract)	0.01167
Totals: Furans			
-TCDF	EPA 8290	ng/L (extract)	< 0.00233
-PeCDF	EPA 8290	ng/L (extract)	< 0.00400
-HxCDF	EPA 8290	ng/L (extract)	0.01100
-HpCDF	EPA 8290	ng/L (extract)	0.00925

Table 1-1
Physical / Chemical Characteristics of Newtown Creek Sediment

PCBs (TCLP)	Method	Units	Mean
PCBs:	EPA MM680/HRGC/MS	ug/L (extract)	
2-Mono	Congenor #1	ug/L (extract)	0.02603
44'-Di	#15	ug/L (extract)	0.00342
244'-Tri	#28	ug/L (extract)	0.00583
22'55'-Tetra	#52	ug/L (extract)	0.00307
33'44'-Tetra	#77	ug/L (extract)	0.00024
2344'5-Penta	#118	ug/L (extract)	0 00012
233'44'-Penta	#105	ug/L (extract)	0.00106
33'44'5-Penta	#126	ug/L (extract)	< 0.00004
233'44'5-Hexa	#156	ug/L (extract)	0.00031
33'44'55'-Hexa	#169	ug/L (extract)	< 0.00006
22'344'55'-Hepta	#180	ug/L (extract)	0.00194
22'33'44'55'-Octa	#194	ug/L (extract)	0.00039
22'33'44'55'6-Nona	#206	ug/L (extract)	< 0.00019
Deca	#209	ug/L (extract)	< 0.00014
PCB Totals:			
-Mono	EPA MM680/HRGC/MS	ug/L (extract)	0.03497
-Di	EPA MM680/HRGC/MS	ug/L (extract)	0.03523
-Tri	EPA MM680/HRGC/MS	ug/L (extract)	0.03662
-Tetra	EPA MM680/HRGC/MS	ug/L (extract)	0.02352
-Penta	EPA MM680/HRGC/MS	ug/L (extract)	0.01562
-Hexa	EPA MM680/HRGC/MS	ug/L (extract)	0.01230
-Hepta	EPA MM680/HRGC/MS	ug/L (extract)	0.00602
-Octa	EPA MM680/HRGC/MS	ug/L (extract)	0 00150
-Nona	EPA MM680/HRGC/MS	ug/L (extract)	< 0.00022



SECTION 2.0

TECHNICAL APPROACH FOR OPERATIONS

As described in the previous proposals, as well as in the description accompanying the poster for Public Outreach Sessions, the Integrated Sediment Decontamination System (ISDS) offers significant process flexibility. This reliable, safe, and cost-effective process can be designed and operated in various modes to accommodate the anticipated significant variations in sediment contamination types and levels, and produce various useful, recyclable end-products. The unit costs can be controlled by modelling the system and planning the treatment/ manufacturing process from the analysis of the feed through the production of the most valuable marketable products.

The ISDS components are shown in Figure 2-1 as a logic and block flow diagram, and consist of:

- **Pre-treatment with water decanting, coarse scalping/screening with a special separator and the HYDRO-SEP℠ process to separate the coarse particles (gravel and possibly sands) from the fine fractions (silts, clays, humates).** Frequently the water washing, using a trommel and possibly an attrition scrubber, is sufficient to clean the gravel/sands for reuse as construction aggregates. Alternately, if the gravel/sands cannot be cleaned of organics/ metals using water, the oversize will require crushing (to -¼-inch depending on equipment design) for subsequent ISDS processing.

  Based on the grain size data provided to us, the gravel/sand fraction varies from 25 percent to about 50 percent of the total solids. The gravel fraction alone varies from 0.1 percent to 34.4 percent, but tends to average near the lower end of this range. As an example, the Newtown Creek sediments provided to us for the bench-scale tests had negligible +¼-inch material for water washing, and the sand fraction was left in the jelly-like sediment to improve the organic extraction. M&E believes that some fraction in the range of 0 to 20 percent of the estimated total sediment may be washable with water alone.

- **The ORG-X℠ Solvent Extraction of organic contaminants process.** A proprietary solvent is used to extract the organic contaminants (oils, PCBs, dioxins, pesticides, etc.) which are strongly attached to the sediment. After several extraction stages, the "organic-free" sediment can:

  1. be partially dried to make a soil blend product when the metals content is acceptable; or

  2. proceed to the next SOLFIX process if metals require fixation.

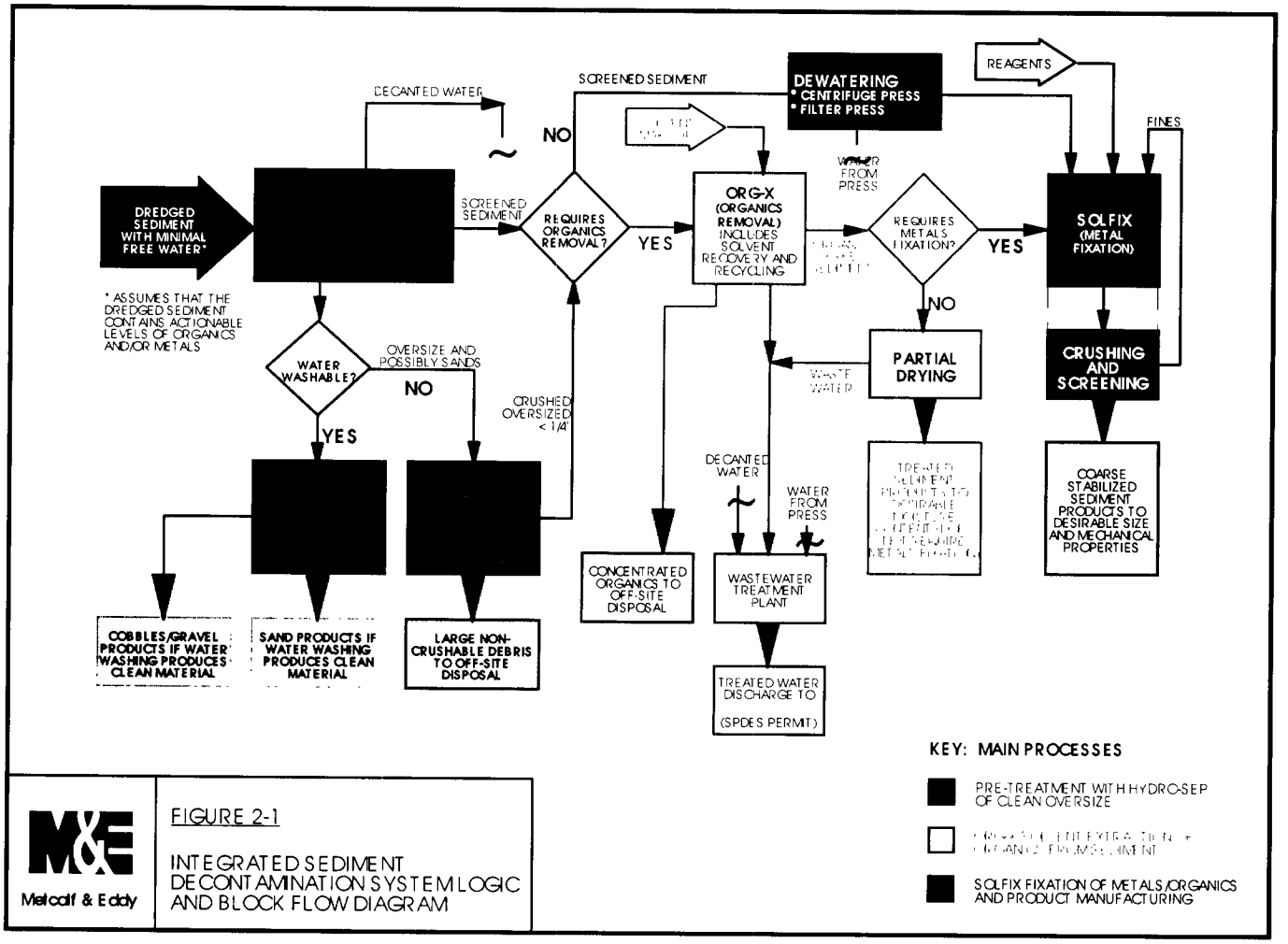
- **The SOLFIX stabilization/ solidification process for inorganic contaminants.** In order to reduce leaching of heavy metals (lead, cadmium, arsenic, etc.), the sediment is reacted with cement, pozzolanic materials and other special additives. The mix is "cured" wherein the heavy metals are chemically immobilized into insoluble forms, as well as micro-encapsulated into a concrete-like solid. The curing also binds free water into a hydrated solid, and alters sediment properties by increasing the compressive strength, increasing

erosion resistance and reducing permeability. The inert end-product can be returned to ocean as marine structures or can be crushed for beneficial uses as construction materials, fill, possibly road base, or landfill cover.

These technologies that make up the ISDS can be used alone or in combination to economically treat sediments having a wide variety of constituents characteristics. After pretreatment and washing of the oversize, there are several possible routes for the sediment:

- ❑ only to SOLFIX if the contaminants are only metals;
- ❑ only to ORG-X if the contaminants are only organics;
- ❑ to ORG-X and SOLFIX for both organics removal and metals fixation.

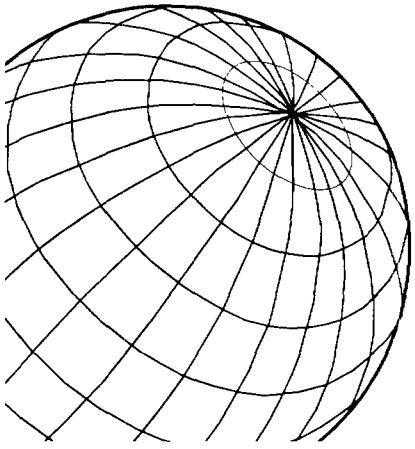
M&E believes the products from each of these processes are viable, and the choice depends on the extent of contamination and the clean-up criteria or product specifications.



Metcalf & Eddy

FIGURE 2-1

INTEGRATED SEDIMENT DECONTAMINATION SYSTEM LOGIC AND BLOCK FLOW DIAGRAM



SECTION 3.0

EXPERIMENTAL DESIGN AND PROCEDURES

3.1 GENERAL OVERVIEW OF BENCH-SCALE TREATABILITY TESTS

The bench-scale study was performed by M&E's sister company, Generale de Rehabitation des Sites (GRS), located in Paris, France, according to the program in the Work Plan. It was done at GRS because of the proprietary nature of the remediation processes and equipment necessary to conduct the testing. Three BNL representatives visited the facility to witness some of the testing in December 1995. The overall testing program is shown in Figure 3-1. As requested by BNL during the trip to the laboratory, the sample schedule and the amounts returned are listed in Table 3-1. BNL prepared the corresponding analytical sample codification per the log shown in Table 3-2.

The testing program began with the shipment of 100 kg of wet sediment from Newtown Creek (which represented at approximately 33 kg of dry soil) from BNL to M&E Branchburg, New Jersey, and then to GRS in accordance with the protocols set forth in the Quality Assurance Project Plan for the New York/New Jersey harbor Sediment Decontamination Technologies Demonstration Project: Bench-Scale Testing of Proprietary Technologies (QAPP)[3,9]. The sample was shipped to GRS in five (5) containers, each weighing 20 kg of sediment. During shipment, the samples remained in their containers at a low temperature, near freezing, with ice and ice-packs. The samples were accompanied by a chain-of-custody record during each step of custody, transfer, and shipment in accordance with the procedures set forth in the QAPP.

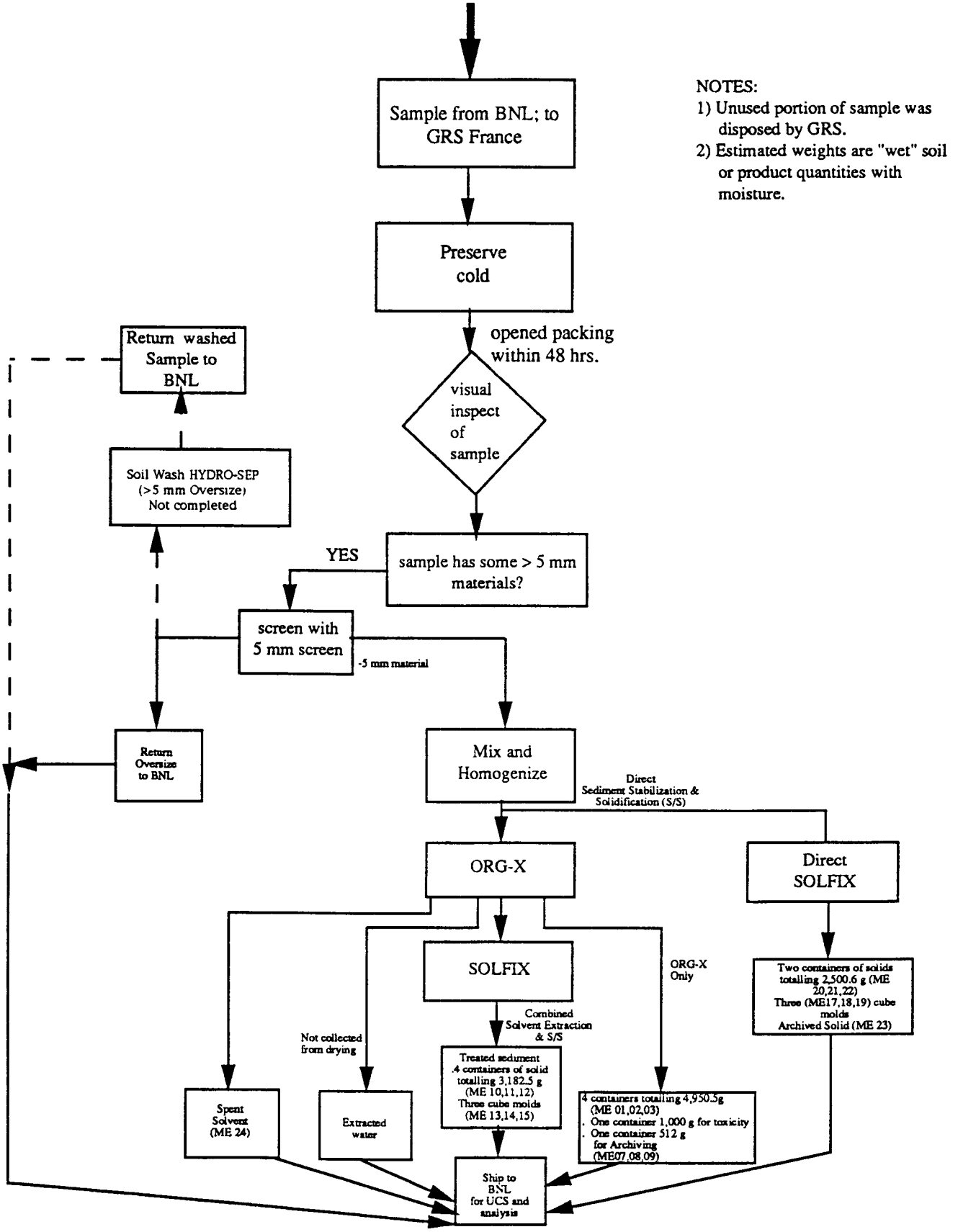
The completed airbill, commercial invoice and a typical analysis of the soil accompanied the chain-of-custody record while the samples were in transit. When physical possession of the samples was transferred, both the individual relinquishing the samples and the individual receiving them signed, dated, and recorded the time on the chain-of-custody record.

3.2 INITIAL SEDIMENT SCREENING

Upon receipt by GRS, the sample was preserved in the dark at the laboratory at 4^0C for a maximum period of 48 hours. Within 48 hours of the receipt of the sample, the sample containers were opened and visually inspected for coarse material greater than 5 mm in profile. A laboratory-scale stainless steel sieve shaker was used to remove particle sizes greater than 5 mm sieve.

The material passing the 5 mm screen was thoroughly mixed to produce a homogeneous sample. All of the oversize from processing 18.625 kg of sediment, was returned to BNL. It was not possible to wash the +5 mm to evaluate the HYDROSEP process because of the minimum amount of oversize. There was just a sufficient amount of oversize soil to return to BNL for possible analysis. Some of the homogenized sediment was used for bench-scale testing of the SOLFIX process. Some of the homogenized sediment was used in the optimization/ process runs of ORG-X and the combined ORG-X/ SOLFIX process and subsequent production of samples of treated end products, side streams and residues.

FIGURE 3-1
OVERALL SCHEMATIC FOR BENCH-SCALE TREATABILITY STUDY WITH DREDGED ESTURINE SEDIMENTS



NOTES:
1) Unused portion of sample was disposed by GRS.
2) Estimated weights are "wet" soil or product quantities with moisture.

Table 3-1
BNL Sample Schedule and Returned Amounts

	Bulk Analysis	*Bio-Toxicity*	*Archiving*	*UCS*	*Oversize*
ORG-X PROCESS					
Air-Dried Soil	4 containers totalling 4,950.5g	1 container 1,000 g	1 container 512 g	molded sample for UCS measurement	N/A
Sediment Oversize	N/A	N/A	N/A	N/A	Oversize from 18,625 g of raw sediment
Extracted Sediment	3,284.5 g from 3,010 g of raw sediment	N/A	N/A	N/A	N/A
Spent Solvent after 3 Extractions	2 containers totalling 877 g obtained from 1,034 g of fresh solvent	N/A	N/A	N/A	N/A
DIRECT SOLFIX PROCESS					
Sample contains additives representing 15% of raw sediment mass	2 continers totalling 2,500.6g	N/A	N/A	N/A	Three 2" cube samples
ORG-X Plus SOLFIX PROCESS					
Sample contains additives representing 15% of dry ORG-X sediment	4 containers totalling 3,182.5g				

TABLE 3-2
BNL LOG OF SAMPLES

Sample Code	*Sample Name*	*Remarks*
ME 01	Treated ORG-X Soil	Soil in bag.
ME 02	Treated ORG-X Soil	Soil in bag.
ME 03	Treated ORG-X Soil	Soil in bag.
ME 04,05,06	Numbers not used	No cubes for ORG-X.
ME 07,08,09	Archived ORG-X Soil	Soil in bag.
ME 10	ORG-X and SOLFIX Solids	Solid in polyethylene bag.
ME 11	ORG-X and SOLFIX Solids	Solid in polyethylene bag.
ME 12	ORG-X and SOLFIX Solids	Solid in polyethylene bag.
ME 13	ORG-X and SOLFIX Solids	Cubes/Mold
ME 14	ORG-X and SOLFIX Solids	Cubes/Mold
ME 15,16	ORG-X and SOLFIX Solids	Cubes/Mold
ME 16	Number not used.	-
ME 17	Direct SOLFIX Solids	Cubes/Mold
ME 18	Direct SOLFIX Solids	Cubes/Mold
ME 19	Direct SOLFIX Solids	Cubes/Mold
ME 20	Direct SOLFIX Solids	Solid in polyethylene bag.
ME 21	Direct SOLFIX Solids	Solid in polyethylene bag.
ME 22	Direct SOLFIX Solids	Solid in polyethylene bag.
ME 23	Archived Direct SOLFIX Solid	-
ME 24	Contaminated Spent Solvent	Glass Jar

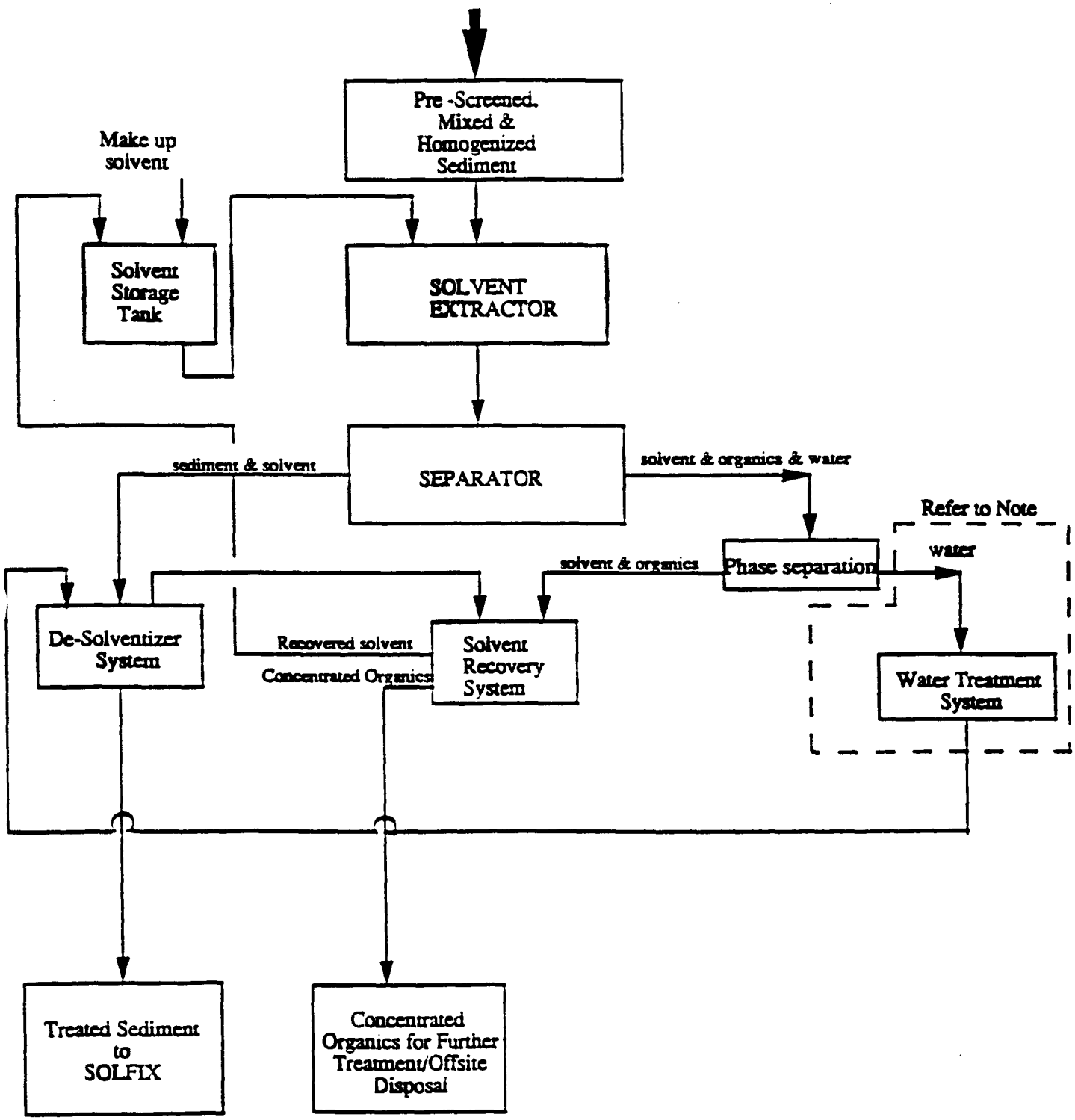
3.3 SUMMARY OF PROTOCOLS

The Work Plan contains the details of the ORG-X and SOLFIX process protocols. Figure 3-2 presents the overall schematic of the ORG-X process to remove organics from sediments. The overall protocol used to optimize the process parameters and produce substantial quantities of the best run is presented in Figure 3-3.

The main variables to be optimized for the ORG-X process are:

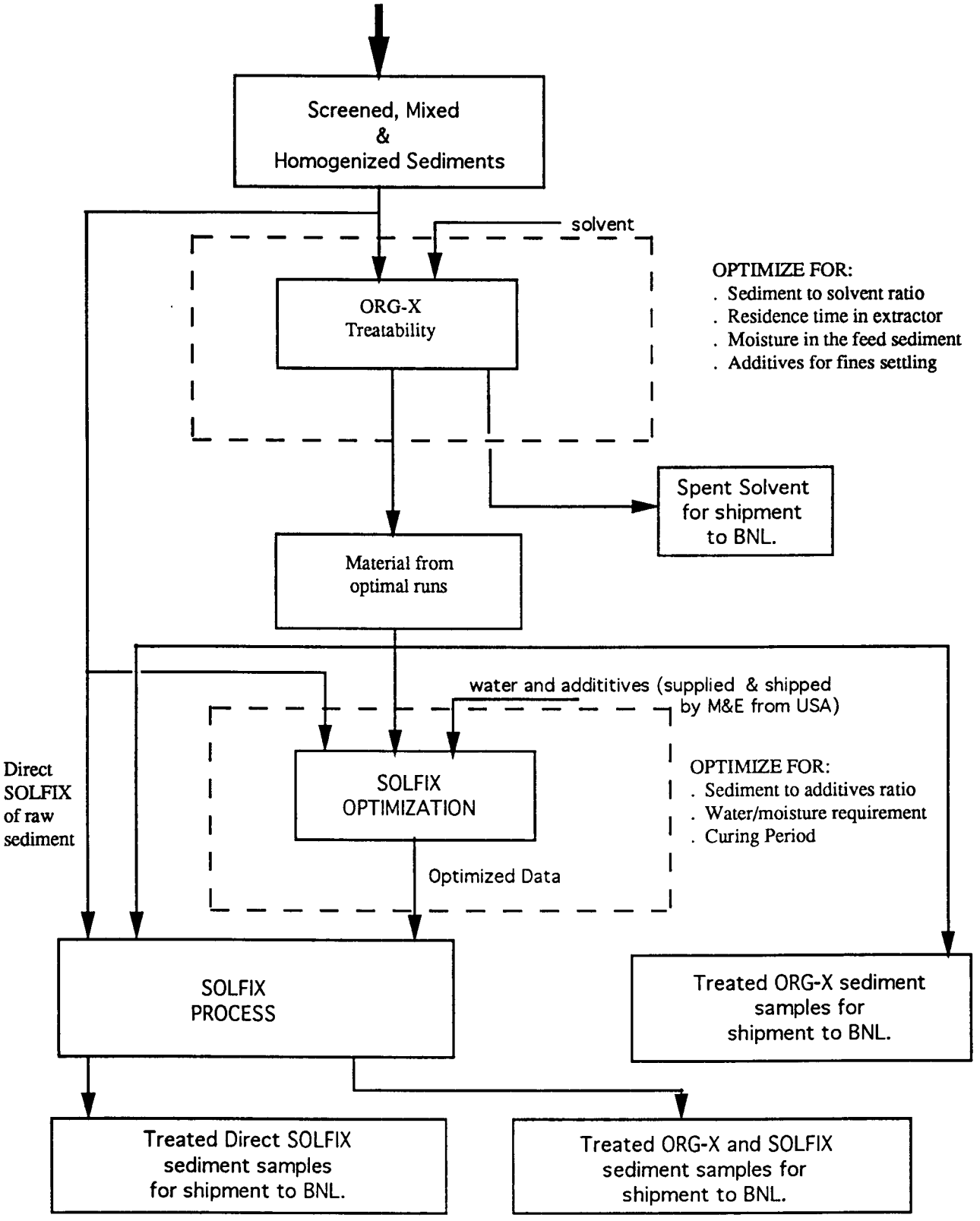
- ❑ Sediment to Solvent ratio;
- ❑ Residue times in solvent extractor and settling times for phase separation;
- ❑ Sediment moisture content;
- ❑ Additives requirement for settling.

FIGURE 3-2
OVERALL SCHEMATIC OF
ORG-X PROCESS TO REMOVE ORGANICS FROM SEDIMENTS



NOTE: The amount of water produced and its treatment is contingent upon the feed material (sediment) moisture content.

FIGURE 3-3
PROTOCOLS FOR ORG-X,
SOLFIX AND
THE COMBINED ORG-X PLUS SOLFIX
PROCESSES

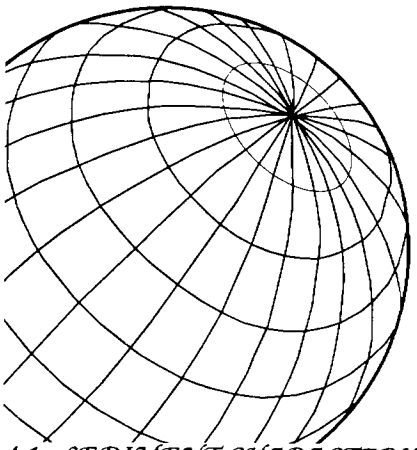


The product from the best run was used for the SOLFIX process, and was submitted to BNL with the related spent solvent sample.

Optimization studies for the SOLFIX process were done for the raw sediment or the ORG-X product. The key variables controlling the SOLFIX process are:

- Additive formulations;
- Sediment to Additives ratio;
- Moisture content of feedstocks;
- Curing period.

The products from the best runs of these two processes were submitted to BNL for unconfined compressive strength tests and leaching characteristics.



SECTION 4.0

EXPERIMENTAL RESULTS

4.1 SEDIMENT CHARACTERIZATION

The sediment received at GRS was homogeneous as it was already well mixed before shipment to M&E/GRS. Table 4-1 gives the sediment fractions on a dry basis from wet sieving. This compares well with the different size fractions presented in Table 1.1.

Table 4-1
Sieve Analysis From Wet Screening

Particle Size	*% Wt. Dry*	*Comments*
Coarse Gravel >5 mm	1	Many light coal-like grains, rope fibers, plastic and fabric pieces.
Sand 0.2 - 5 mm	7	
Fine Sand 0.063 - 0.2 mm	22	
Clay/Silt <0.063 mm	70	
% Solids	33	Black wet, gray dry

The sediment is black when wet with a jello-mayonnaise-like consistency. The sediment has a foul fuel oil odor and the color changes to grey on drying. The material is very hydrophilic and less than one percent water is released to surface after two days.

The solid matter content is 33 percent, as determined from drying just below 100°C, and is the same as the BNL average in Table 1-1.

The organic matter was measured according to the French ROCKEVAL method (thermal desorption followed by pyrolysis and oxidation). The results are in Table 4-2.

Table 4-2
Organic Matter Content in Sediment

Organic Contaminant	*ppm, Dry Weight*
Light hydrocarbons up to C_{18} (desorbed at 180°C)	5, 320
Medium weight hydrocarbons (desorbed between 180°C at 400°C)	9, 100
Heavy hydrocarbons (resins...)	6, 370
Residual carbon (coal, coke, graphite)	16, 300
Total organic carbon	37, 090

This method gives an organic carbon content of 3.71 percent, lower than the 7.32 percent measured by BNL. The GRS laboratory also used another method to measure the potential total extractable organics. Several extractions with methylene chloride resulted in 16,000 ppm of extractable organics.

GRS performed a mineral analysis using an X-ray fluorimeter; the results are presented in Table 4-3.

Table 4-3
Minerals Analysis

Mineral	% Dry Weight
Si	10.8
Na	4.8
Al	3.6
Cl	3.6
Fe	3.0
K	1.5
S	1.2
Mg	1.2
Ca	0.9
P	0.3
Ti	<0.3
Zn	<0.3
Cu	<0.3
Pb	<0.3
Cr	<0.3
Ni	<0.3
Mm	<0.3
Ba	<0.3

These results for Zn, Pb, Cr, Cu, and Ni are consistent with the BNL average results in Table 1-1.

In addition to decanting the minimal amount of surface water, attempts were made to further dewater the sediment by centrifugation. A laboratory centrifuge was used at an acceleration of 1,000 G for three minutes. This was preceded by two minutes acceleration to 1,000 G and was followed by several minutes of deceleration.

The following three phases were obtained, with a typical breakdown as follows:

Phase	Description	% of Total
Phase 1	"water" containing 0.8% dry matter	11.7
Phase 2	a "gel" containing 17.9% dry matter	24.4
Phase 3	a soil-like phase containing 49% dry matter	63.9

The phase 2 gel proved to be very stable, as none of the following actions could break it:

- ❑ exposure to ultrasound combined with heating to 70°C;
- ❑ addition of anionic and cationic/polymer floculants;
- ❑ addition of ferric chloride;
- ❑ addition of surfactant;
- ❑ addition of HCl or H_2SO_4 acid, down to a pH of 3 (strong H_2S odor evolved); and
- ❑ addition of NaOH, up to a pH of 11 (strong NH_3 odor evolved).

We concluded that additional water removal using mechanical means is not effective with the raw sediment. We also discovered that maintaining the sediment fluid is better for the ORG-X process, because it prevents equipment fouling and aids in the penetration of solvent into the aqueous sediment layer.

4.2 ORG-X EXTRACTION PROCESS

4.2.1 Laboratory Set-up and Protocol

Several experimental procedures were used, because the sediment was not treatable according to the standard protocol.

The final optimum protocol used for solvent extraction of the sediment was the following:

a. Use 400 g sediment with previously measured water content (67%).

b. Put into a two liter polyethylene bottle with a square section.

c. Add 400 ml solvent obtained from the previous extraction.

d. For the first extraction, mix solvent and sediment using a high shear strength propeller

for three minutes with a 50 Watt motor at 1,600 rpm. Settle for two minutes and decant solvent.

e. For the second extraction, mix solvent and sediment for five minutes with same agitation. Settle for two minutes and decant solvent.

f. For the third extraction, mix sediment and clean water saturated solvent obtained from solvent distillation for 10 minutes. Settle for two minutes and decant solvent.

g. Dry sediment at approximately 100°C until no more solvent odor is detectable. For control purposes the sediment was dried completely. This operation was carried out in a sand bath and finished in a controlled temperature dryer.

h. Distill dirty solvent obtained after first extraction using a rotary evaporator.

4.2.2 Treatability Study Results

The ORG-X product submitted to BNL was brown/grey in color and was more soil-like as some of the fine particles agglomerated and the % solids increased from 33 percent to 97 percent. Table 4-4 (on the following page) compares the fractions of the initial feed with the mean of two ORG-X product samples. On a dry basis, the clay plus silt fraction was reduced from 82 percent for the raw sediment and to 41 percent for the ORG-X product. M&E believes that this difference is due to agglomeration on drying and that possibly wet sieving was used for the raw sediment versus dry sieving for the ORG-X product. This position is supported by the evidence that the spent solvent contains little fines. In the production plant, any fines in the spent solvent can be removed by filtration/centrifugation and recycled to the extraction operation.

Other properties also changed. The pH decreased from 7.9 in the raw sediment to 7.0 in the product. The total sulfides decreased significantly by 98 percent to 130 mg/kg. Total organic carbon decreased from 7.3 percent to 6.1 percent indicating that the very heavy humic material and tars are still present.

The organic removal performance of the solvent extraction process was calculated in Table 4-5 using same ROCKEVAL thermal desorption analysis of raw sediment before and after the three solvent extraction stages.

Table 4-5
Organics Removal Using
Three Countercurrent Extraction Stages

Organic Type	Raw Sediment (ppm, dry weight)	Extracted Sediment (ppm, dry weight)	% Reduction
Light hydrocarbons up to C18 (desorbed at 180°C)	5, 320	0	100
Medium weight hydrocarbons desorbed between 180°C and 400°C	9, 100	1, 270	86
Total hydrocarbons	20, 790	1, 790	91
Heavy hydrocarbons (resins...)	6, 370	520	92

The extraction is more effective for the lighter than the heavier hydrocarbons. Based on experience, these preliminary, quick initial results were believed to be sufficient to meet the goal of one to two orders of magnitude removal of heavy non-water soluble chlorinated hydrocarbons, such as PCBs, pesticides and dioxins/furans. The GRS laboratory did not analyze for individual organic contaminants as BNL would perform those analyses. Greater organics removal is possible by using a higher solvent-to-sediment ratio, available warmer recycle solvent, more stages in a countercurrent continuous extractor, and using a mix of closely related solvents. In the future and during the pilot phase, these parameters can be optimized to meet the goal of minimum cost, when the final clean-up standards are determined, more data is generated on partitioning coefficient of each compound and the extraction systems are simulated.

The analytical results for numerous contaminants of concern of the ORG-X process samples submitted to

to BNL are summarized and compared in Appendix B. Table B-1 compares the contaminant mean of the raw sediment with the ORG-X sediment product. Table B-2 presents the contaminant concentration for the

Table 4-4
Comparison of Product Characteristics for Raw Sediment and ORG-X Products

Item		Units	Raw Sediment	Mean of 2 Samples	% Point Change
Particle Size					
Medium Gravel	>4.75 mm	% wt (dry)	0.04	0	0.04
Fine Gravel	2 - 4.75 mm	% wt (dry)	0.38	1.01	-0.63
Very Coarse Sand	0.85 - 2 mm	% wt (dry)	0.83	6.935	-6.105
Coarse Sand	0.425 - 0.85 mm	% wt (dry)	2.15	20.35	-18.2
Medium Sand	0.24 - 0.425 mm	% wt (dry)	5.05	12.5	-7.45
Fine Sand	0.106 - 0.24 mm	% wt (dry)	9.57	14.4	-4.83
Very Fine Sand	0.075 - 0.106 mm	% wt (dry)	2.80	4.15	-1.35
Clay		% wt (dry)	35.57	13.4	22.17
Silt		% wt (dry)	44.95	27.85	17.1
pH		pH units	7.90	6.96	0.94
Solids (total)		% wt (dry)	33.05	97.35	-64.3
Sulfides (total)		mg/kg (dry)	7,833.33	130	7,703.33
Organic Carbon (total)		% wt (dry)	7.32	6.095	1.225
Unconfined Compressive Strength		psi	N/A	N/A	
Bulk Density		lbs/ft^3	N/A	N/A	

N/A = Not applicable or available

spent solvent. This information as well as the mass quantities used in the three extractions was used to prepare a mass balance by contaminant and calculate the % removal where meaningful. For example, if all the figures for the streams were less than the minimum detection limits (MDL), the % reduction cannot be calculated. The results are tabulated in Figure B-1 of Appendix B and are summarized below for each group of contaminant.

	% Removal, Range
PCBs Total	79 - 92
Pesticides	94 - 98
Chlorinated Herbicides	*
Semi-volatile Compounds	47 - 91
Total Dioxins	Not meaningful to 66.
Total Furans	Not meaningful to 40.
Metals	Little to no change.

* Not calculable, but significant amounts in solvent.

The main reason the chlorinated herbicides are not calculable is because both concentrations for the sediment and the product are less than the low minimum detection limits (MDL, ng/g). The concentration in the solvent was also less than the MDL (μg/g). The total dioxins and total furans removal is low or not meaningful, because of the very low concentration (ng/kg) and because the overall calculated quantity increases in the sediment and solvent. If just the raw sediment and the spent solvent figures are used, the % removal ranges from 61 - 82 percent for total dioxins and 64 - 84 percent for total furans. The results are similar for the individual congeners. For example, concentration for 2, 3, 7, 8 TCDD, which has the highest toxic equivalency factor of 1.0 at 1 μg/kg,

is very low at 41.5 ng/kg for the raw sediment and 20.0 ng/kg for the ORG-X product.

The leaching characteristics of the ORG-X product were analyzed by the TCLP EPA methods. Table B-1 in Appendix B compared the TCLP results for numerous contaminant with the raw sediment from Newtown Creek. In general, the TCLP results of the metal contaminants is very low at below detection limits, and is less than the regulatory level for hazardous waste characterization (see Appendix A). The percentage change is either not meaningful or not calculable for most contaminants. As for metals, the TCLP values for organics are frequently below the MDL and the % change is not calculable. A reduction of 45 to 99 percent was attained for PCBs as the TCLP values were usually detectable for the raw sediment and not the final ORG-X product.

4.2.3 *Material Balance for ORG-X Based on Bench Tests*

The mass balance in Table 4-6 was established using water saturated solvent for three solvent extractions of the sediment.

The ORG-X Process based on the treatability study data is presented in Figure 4-1 and the material balance is in Table 4-7 for various feed conditions.

The treatability study simulated a batch process with the following unit operations:

- Three (3) stages of solvent-sediment mixing in mixing tank. After each phase of mixing, the sediment falls to the tank bottom very rapidly. The solvent is then removed and replaced. Clean solvent is used for Stage 3 (10 minutes mixing). The resulting solvent is used for Stage 2 (5 minutes mixing) for another batch of sediments. The resulting solvent is used for Stage 1 (3 minutes mixing). The liquid/solid mass ratio is approximately 0.9 and the liquid/solid volume ratio is 1.
- Complete drying at slightly greater than 100°C.
- Solvent regeneration by distillation in a flash boiler.

The following operations were not simulated but are easily engineered:

- condensing the solvent and water evaporated from the sediment drying
- treating the water recovered during this operation, e.g., by batch distillation at 90°C. Steam stripping is another option.

Table 4-6
Mass Balance for Three Solvent Extractions

	Sediment (g)	Clean Solvent (g)	Dirty Solvent (g)	Heavy Organics Dissolved in Solvent (g)
Input to Extraction Step 1	500	437.5		
Recovered from Extraction Step 1	572		345.2	3.22
Input to Step 2	572	437.9		
Recovered from Step 2	567.3		432.2	0.59
Input to Step 3	567.3	438.1		
Recovered from Step 3	564.3		429.5	0.16

Performance/Checks: Total Input: 1813.5 g Total Output: 1771.2 g
Loss: 42.3 g Total Organics Recovered: 3.97 g

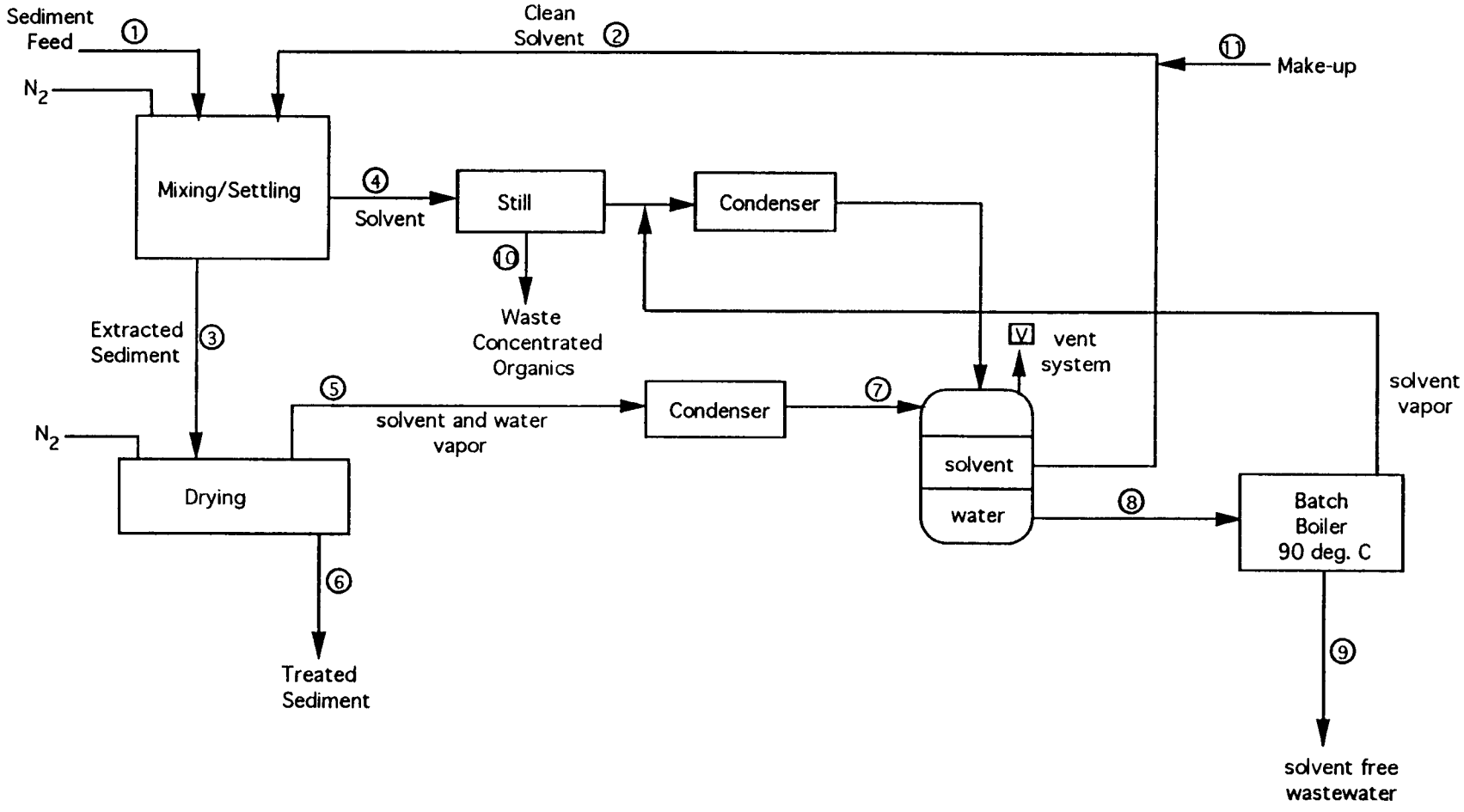


FIGURE 4-1 ORG-X BLOCK FLOW DIAGRAM WITH STREAM NUMBERS REFERENCED IN TABLE 4-7 AND TABLE 4-8

Table 4-7
ORG-X Treatability Study Material Balance
Basis: Amounts are in kg for 1,000 kg sediment feed

Stream	1	2	3	4	5	6	7	8	9	10	11
Component	Sediment Input	Lean Solvent	Mixing Tank Sediment	Mixing Tank Solvent	Dryer Vapor	Treated Sediment	Condensed Vapor	Waste water	Recovered Water	Waste	Solvent Make-Up
Dry Matter	361 (1)		358	3 (4)		358				3	
Solvent		873	85 (3)	788	85		876	13 (6)		10	10
Water	630	27 (5)	632	25	629	3	664	641	641		
Extracted Organics	5 - 12 (2)			5 - 12 (2)						5 - 12 (2)	
TOTAL	1,000	900	1,075	825	714	361	2,340	654	641	22	22

Notes:
1) Values range from 300 to 400 kg.
2) Values range from 5 to 12 kg.
3) Values range from 70 to 140 kg.
   Value = 129 kg according to mass balance
4) Values range from 2 to 4 kg.
5) Water solubility in solvent is 2.9%.
6) Solvent solubility in water is 1.8%.
   The solvent-water azeotrope contains 10.6% water and boils at 76° C.

4.2.4 Proposed ORG-X Process

If the mechanical properties of the ORG-X product have to be improved or the metals have to be stabilized, the solidification/stabilization additives used require water for reaction. Therefore, the sediment should be dried to the water content needed for stabilization and solidification. The evaporation should be stopped when the residual solvent reaches a target level. The advantages are significant by lowering the operating and capital costs. It avoids excess water evaporation, condensing and subsequent treatment. The drying can be done in a vacuum or atmospheric paddle/ribbon dryer with good mixing. Water evaporation can theoretically be as low as the amount of water evaporated with the solvent azeotrope.

The process should also include a filtration step to remove fines carried over in the spent solvent. These fines should be recycled to the extraction step to minimize cost of waste organics disposal. A good performance filter should lower the % sediment loss to an estimated 0.25% of sediment.

The organic waste needs to be concentrated to minimize disposal cost while maintaining fluidity for discharging/filling drums. This can be accomplished with a thin film evaporator such as a Lewe in the fill-scale plants. It is estimated that approximately 20% solvent is sufficient for dissolving organics.

4.3 SOLFIX STABILIZATION AND SOLIDIFICATION PROCESS

4.3.1 Protocol for the SOLFIX Process

The SOLFIX process was used to stabilize and solidify both the ORG-X product and raw sediment. The protocol developed in the Work Plan was essentially followed.

The material to be treated was weighed and put into a 0.5-liter or 1-liter beaker. The quantities used for the optimization tests were either 200, 400 or 500 grams. The material is homogenized with a 50 watt screw agitator made by BioBloc. Additives were weighed and introduced progressively under agitation. If the agitator torque was excessive as

the additives were added, water was introduced progressively until the torque and mixing returned to normal. The amount of water was measured. Mixing is continued for five minutes at 1,000 rpm. The beaker was also continuously moved off-center in order to mix all product. The same protocol was used on batch quantities of 500 g of raw sediment or ORG-X product in a controlled kneading machine with a 1-liter capacity.

After mixing, the material was transferred to two-inch by two-inch by two-inch brass cube molds or PVC cylinders with an internal diameter of 50 mm and a length of 120 mm. The cubes were filled starting with the corners, then the edges and sides of container to reduce void space. The mixture was then introduced by layers of one mm thickness, each compacted separately. A similar procedure is adapted for the PVC cylinders. The temperature rise above 30°C was measured with a mercury thermometer while the molds were setting for 24 to 48 hours. The molds were then opened and the sample was cured in a moist atmosphere, either under water or wrapped in moist paper enclosed in the curing box.

After seven days, a hand-held penetrometer test was performed, usually giving a quick unconfined compressive strength (CS) reading between 0 and 50 psi. The production of larger quantities of SOLFIX material used pie molds with a diameter of 28 cm, which were filled with 1.5 cm material and covered with wet paper during curing. These pies were broken and packed in plastic bags containing a piece of wet paper.

4.3.2 *SOLFIX Treatability Results for the Raw Sediment*

GRS tested three reagents at various % additions to obtain a solid material that was expected to have an UCS of greater than 50 psi.

Reagent: Silicate Material				
% of Raw Sediment	25	37.5	50	50
UCS (psi) after 7 days	0	0	0	0

Reagent: Cement-Type Additive				
% of Raw Sediment	3.4	6.75	15	25
UCS (psi) after 7 days	0	0	>50	>50

Reagent: Cement Kiln Dust
UCS was 0 with 100 percent kiln dust added.

The mixture containing 15 percent cement of the raw sediment was selected as the final composition. This was further tested in a geotechnical lab, on a 50 mm x 100 m cylinder, with the following results:

UCS = 510 k Pa (728 psi) at 14 days
bulk density: 1640 kg/m^3 (102 lbs/ft^3)
water content: 27 percent

The BNL results for the Direct SOLFIX material were 102.2 psi for UCS at greater than 28 days and 80.7 lbs/ft^3 for the bulk density.

4.3.3 *SOLFIX Treatability Results for ORG-X Treated Sediment*

The cement type additive was used as the reagent. Since the ORG-X product only contained three percent water, water had to be added to attain a high but reasonable torque at 1,000 rpm. The results are tabulated below:

% Cement Additive of ORG-X Product	5	8	10	15
% Water of ORG-X Product	73	70	70	75
UCS (psi) after 7 days	0	0	>50	>50

A test with 100 percent kiln dust and 120 percent water failed. The final composition of 15 percent cement type additive was selected. This was tested in a geotechnical laboratory, with the following results at 14 days:

UCS = 420 k Pa (600 psi)
specific mass = 1650 kg/m^3 (103 lbs/ft^3)
water content = 34.2 percent

The BNL results for this product were 487 psi for UCS at greater than 28 days. No bulk density was measured.

This solidification process not only attains higher compressive strengths, but improves other properties which are desirable for the various potential uses of the products. For example, the products exhibit lower permeability and better erosion resistance. Tests can be done in the future to measure these features as well, and establish optimized compositions for various product features.

The component ratios of treated sediment, reagents and water can be changed to produce the desired product features at minimum cost. The addition of accelerators can also be studied to reduce the curing times and properly manage inventory.

4.3.4 Leaching Characteristic Tests

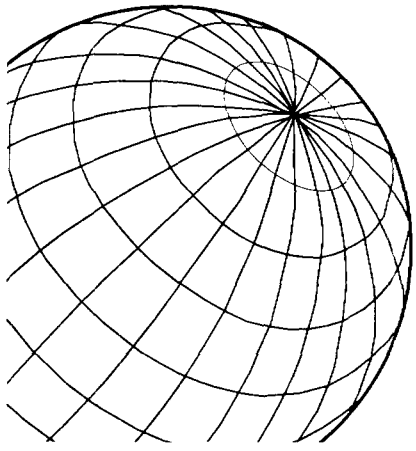
A leaching test was performed during 18 hours with 2,000 g of purified water for 100 g material crushed at less than 10 mm. The results show similar data for all three samples tested.

Product	Mixture Age (days)	ppm (dry)			
		Cu	Zn	Cd	Ni
Direct SOLFIX Product with 15% cement type additive	28	4.8	<2	<0.8	5.2
ORG-X and SOLFIX Product with 15% cement type additive	24	4.4	<2	<0.8	5.4
ORG-X and SOLFIX Product with 10% cement type additive	24	5.6	<2	<0.8	<4

BNL completed TCLP tests for other metals and the organic contaminants of concern. The results are given in Table C-1 in Appendix C for the direct SOLFIX process stabilizing the raw sediment and Table C-2 for the ORG-X plus SOLFIX treated sediment.

The TCLP for the treated raw sediment were all below the minimum detection limit except for chromium. Therefore, the percent reduction can only be calculated for chromium at >64.7 percent.

The TCLP for the treated ORG-X plus SOLFIX product were also all below the low minimum detection limit except for chromium. The percent reduction for chromium was calculated at >47 percent. Based on our prior experience, M&E believes that such SOLFIX fixation performance is not representative of the better performance achieved with higher TCLP levels.



SECTION 5.0

COST ESTIMATES FOR PRODUCTION- AND FULL-SCALE PLANTS

Based on the bench-scale results and expected improvements to be demonstrated during the pilot plant program, M&E has developed preliminary estimated unit operating costs for a production-scale plant (100,000 cy/yr) and a full-scale plant (500,000 cy/yr). These are summarized in Table 5-1 below:

Table 5-1
Operating Unit Cost for
Production- and Full-Scale Plants

Process	Production-Scale Plant (100,000 cy/yr)	Full-Scale Plant (500,000 cy/yr)
HYDRO-SEP and SOLFIX	$54 / cy	$32 / cy
HYDRO-SEP and ORG-X	$64 / cy	$31 / cy
HYDRO-SEP, ORG-X and SOLFIX	$80 / cy	$42 / cy

Notes:
1. HYDRO-SEP separates and treats oversize particles estimated at 10% of raw sediment. The other 90% is treated by the subsequent process(es).

2. Organic waste product does not contain regulated dioxin quantities (see text for discussion).

The unit costs decrease significantly as the size of the plant increases by a factor of five. All costs are less than $100/cy. The unit cost assumes the concen-trated organic waste from the ORG-X process is not regulated (because of dioxin < 1ppb and disposal costs are $0.20/lb. If it is regulated, the costs could increase by $40/cy of sediment for the ORG-X and the ORG-X plus SOLFIX processes. This is because of the very high disposal cost of $2.00/lb at the Rollins' Coffeyville, Kansas facility, the only incinerator in the U. S. permitted to burn regulated dioxin waste. An alternative to incinera-tion of the regulated organic waste is to use the Base Catalyzed Dechlorination (BCD) process. This can be evaluated in the future and eventually added to the treatment process train if economical. The unit costs also assume HYDRO-SEP[SM] is used to wash the oversize particles, estimated at 10 percent of the total sediment. If it is greater than 10 percent, the overall unit costs will decrease, as the quantity going to the more expensive downstream processes decrease.

The estimated operating cost figures are supported by the corresponding Tables 5-2, 5-3, 5-4, 5-5, 5-6 and 5-7 for the six combinations of three treatment process trains and two production capacities. The tables include the main case features such as process and plant size, order of magnitude, capital costs, and break-down of the unit costs by materials, utilities, disposal costs, labor, maintenance supplies, operating supplies. plant overhead costs and depreciation.

The six different capital costs in the tables are for a site near the NY/NJ harbor but do not include land costs. The plant would be automated with a distributed control system and would have reasonable auxiliary support and storage facilities. The capital cost for the production-scale plant (100,000 cy/yr capacity) ranges from $5 million to $9 million. The capital cost for the full-scale plant (500,000 cy/yr capacity) ranges from $10 million to $20 million).

The commercial size features will be further defined during the design phase based on the specific site, quantity, capacity required, physical and chemical properties of sediment to be treated, properties of products to be marketed, and process systems features to be confirmed during the pilot plant program.

Table 5-2 Estimated Treatment Cost for ISDS at 100,000 cy/yr (1 cy = 1 ton)

(Assumes 10% of sediment to HYDRO-SEP and 90% of sediment to SOLFIX (35% solids); Capital Cost (FCI) = $5 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
H&S Clothing	clothing set	$25	6,935	$173,375	$1.73
Cement	tons	$100	15,750	$1,575,000	$15.75
Additives	lb.	$1	100,000	$100,000	$1.00
Misc.					
Utilities:					
Electricity	kWhr	0.09	600,000	$54,000	$0.54
Fuel Oil	MMBtu	3.83	13,000	$50,000	$0.50
Labor:/ with 35% benefits					
Operators (10)	hr.	$27.00	21,900	$591,300	$5.91
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$3.15
Site Manager (1)	hr.	$50.00	2,190	$109,500	$1.10
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.99
Mechanics (2)	hr.	$36.00	4,380	$157,680	$1.58
Laborers (3)	hr.	$20.00	6,570	$131,400	$1.31
Chemists (2)	hr.	$40.00	4,380	$175,200	$1.75
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.70
Subtotal				$1,649,070.00	$16.49
Maintenance Supplies, 5% of FCI/yr				$250,000.00	$2.50
Operating Supplies, 1% of FCI/yr				$50,000.00	$0.50
Plant Overhead Costs, 60% of Labor				$989,442.00	$9.89
Depreciation, 10% of FCI/yr				$500,000.00	$5.00
TOTAL TREATMENT COST				$5,440,887.00	$54.41

Table 5–2 Estimated Treatment Cost for ISDS at 100,000 cy/yr (1 cy ≃ 1 ton)

(Assumes 10% of sediment to HYDRO–SEP and 90% of sediment to SOLFIX (35% solids); Capital Cost (FCI) = $5 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
H&S Clothing	clothing set	$25	6,935	$173,375	$1.73
Cement	tons	$100	15,750	$1,575,000	$15.75
Additives	lb.	$1	100,000	$100,000	$1.00
Misc.					
Utilities:					
Electricity	kWhr	0.09	600,000	$54,000	$0.54
Fuel Oil	MMBtu	3.83	13,000	$50,000	$0.50
Labor:/ with 35% benefits					
Operators (10)	hr.	$27.00	21,900	$591,300	$5.91
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$3.15
Site Manager (1)	hr.	$50.00	2,190	$109,500	$1.10
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.99
Mechanics (2)	hr.	$36.00	4,380	$157,680	$1.58
Laborers (3)	hr.	$20.00	6,570	$131,400	$1.31
Chemists (2)	hr.	$40.00	4,380	$175,200	$1.75
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.70
Subtotal				$1,649,070.00	$16.49
Maintenance Supplies, 5% of FCI/yr				$250,000.00	$2.50
Operating Supplies, 1% of FCI/yr				$50,000.00	$0.50
Plant Overhead Costs, 60% of Labor				$989,442.00	$9.89
Depreciation, 10% of FCI/yr				$500,000.00	$5.00
TOTAL TREATMENT COST				$5,440,887.00	$54.41

Table 5-3 Estimated Treatment Cost for ISDS at 500,000 cy/yr (1 cy = 1 ton)
(Assumes 10% of sediment to HYDRO-SEP and 90% of sediment to SOLFIX (35% solids); Capital Cost (FCI) = $10 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
H&S Clothing	clothing set	$25	6,935	$173,375	$1.73
Cement (15%)	tons	$100	15,750	$7,875,000	$15.75
Additives	lb.	$1	500,000	$500,000	$1.00
Misc.					
Utilities:					
Electricity	kWhr	0.09	24,000,000	$2,160,000	$4.32
Fuel Oil	MMBtu	3.83	26,000	$99,580	$0.20
Labor:/ with 35% benefits					
Operators (10)	hr.	$27.00	21,900	$591,300	$1.18
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$0.63
Site Manager (1)	hr.	$50.00	2,190	$109,500	$0.22
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.20
Mechanics (2)	hr.	$36.00	4,380	$157,680	$0.32
Laborers (3)	hr.	$20.00	6,570	$131,400	$0.26
Chemists (2)	hr.	$40.00	4,380	$175,200	$0.35
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.14
Subtotal				$1,649,070.00	$3.30
Maintenance Supplies, 5% of FCI/yr				$500,000.00	$1.00
Operating Supplies, 1% of FCI/yr				$100,000.00	$0.20
Plant Overhead Costs, 60% of Labor				$989,442.00	$1.98
Depreciation, 10% of FCI/yr				$1,000,000.00	$2.00
TOTAL TREATMENT COST				$15,146,047.00	$31.68

Table 5–3 Estimated Treatment Cost for ISDS at 500,000 cy/yr (1 cy ≈ 1 ton)

(Assumes 10% of sediment to HYDRO–SEP and 90% of sediment to SOLFIX (35% solids); Capital Cost (FCI) = $10 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
H&S Clothing	clothing set	$25	6,935	$173,375	$1.73
Cement	tons	$100	15,750	$7,875,000	$15.75
Additives	lb.	$1	500,000	$500,000	$5.00
Misc.					
Utilities:					
Electricity	kWhr	0.09	24,000,000	$2,160,000	$4.32
Fuel Oil	MMBtu	3.83	26,000	$99,580	$0.20
Labor:/ with 35% benefits					
Operators (10)	hr.	$27.00	21,900	$591,300	$1.18
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$0.63
Site Manager (1)	hr.	$50.00	2,190	$109,500	$0.22
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.20
Mechanics (2)	hr.	$36.00	4,380	$157,680	$0.32
Laborers (3)	hr.	$20.00	6,570	$131,400	$0.26
Chemists (2)	hr.	$40.00	4,380	$175,200	$0.35
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.14
Subtotal				$1,649,070.00	$3.30
Maintenance Supplies, 5% of FCI/yr				$500,000.00	$1.00
Operating Supplies, 1% of FCI/yr				$100,000.00	$0.20
Plant Overhead Costs, 60% of Labor				$989,442.00	$1.98
Depreciation, 10% of FCI/yr				$1,000,000.00	$10.00
TOTAL TREATMENT COST				$15,146,047.00	$43.68

Table 5-4 Estimated Treatment Cost for ISDS at 100,000 cy/yr (1 cy = 1 ton)
(Assumes 10% of sediment to HYDRO-SEP and 90% of sediment to ORG-X (35% solids); Capital Cost (FCI) = $8 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
Solvent(s)	lb.	$0.52	414,000	$215,280	$2.15
H&S Clothing	clothing set	$25	6,935	$173,375	$1.73
Misc.					
Utilities:					
Electricity	kWhr	0.09	9,000,000	$810,000	$8.10
Steam	1,000 lb	4.59	100,000	$459,000	$4.59
Fuel Oil	MMBtu	3.83	13,000	$50,000	$0.50
Cooling Water	1,000 gal	0.13	1,217,481	$158,273	$1.58
Disposal Costs:					
Transportation of Organic Waste	lb.	0.02	2,050,000	$41,000	$0.41
Incineration of Organic Waste	lb.	0.2	2,050,000	$410,000	$4.10
Labor:/ with 35% benefits					
Operators (12)	hr.	$27.00	26,280	$709,560	$7.10
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$3.15
Site Manager (1)	hr.	$50.00	2,190	$109,500	$1.10
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.99
Mechanics (2)	hr.	$36.00	4,380	$157,680	$1.58
Laborers (3)	hr.	$20.00	6,570	$131,400	$1.31
Chemists (2)	hr.	$40.00	4,380	$175,200	$1.75
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.70
Subtotal				$1,767,330.00	$17.67
Maintenance Supplies, 5% of FCI/yr				$400,000.00	$4.00
Operating Supplies, 1% of FCI/yr				$80,000.00	$0.80
Plant Overhead Costs, 60% of Labor				$1,060,398.00	$10.60
Depreciation, 10% of FCI/yr				$800,000.00	$8.00
TOTAL TREATMENT COST				$6,424,655.53	$64.25

* Dioxin <1 ppb is not regulated. If dioxin >1ppb, it is regulated and costs $2.00/lb and additional cost is $36.90/ton.

Table 5–4 Estimated Treatment Cost for ISDS at 100,000 cy/yr (1 cy ≈ 1 ton)

(Assumes 10% of sediment to HYDRO–SEP and 90% of sediment to ORG–X (35% solids); Capital Cost (FCI) = $8 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
Solvent(s)	lb.	$0.52	414,000	$215,280	$2.15
H&S Clothing	clothing set	$25	6,935	$173,375	$1.73
Misc.					
Utilities:					
Electricity	kWhr	0.09	9,000,000	$810,000	$8.10
Steam	1,000 lb	4.59	100,000	$459,000	$4.59
Fuel Oil	MMBtu	3.83	13,000	$50,000	$0.50
Cooling Water	1,000 gal	0.13	1,217,481	$158,273	$1.58
Disposal Costs:					
Transportation of Organic Waste	lb.	0.02	2,050,000	$41,000	$0.41
Incineration of Organic Waste	lb.	0.2	2,050,000	$410,000	$4.10
Labor:/ with 35% benefits					
Operators (12)	hr.	$27.00	26,280	$709,560	$7.10
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$3.15
Site Manager (1)	hr.	$50.00	2,190	$109,500	$1.10
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.99
Mechanics (2)	hr.	$36.00	4,380	$157,680	$1.58
Laborers (3)	hr.	$20.00	6,570	$131,400	$1.31
Chemists (2)	hr.	$40.00	4,380	$175,200	$1.75
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.70
Subtotal				$1,767,330.00	$17.67
Maintenance Supplies, 5% of FCI/yr				$400,000.00	$4.00
Operating Supplies, 1% of FCI/yr				$80,000.00	$0.80
Plant Overhead Costs, 60% of Labor				$1,060,398.00	$10.60
Depreciation, 10% of FCI/yr				$800,000.00	$8.00
TOTAL TREATMENT COST				$6,424,655.53	$64.25

* Dioxin <1 ppb is not regulated. If dioxin >1ppb, it is regulated and costs $2.00/lb and additional cost is $36.90/ton.

Table 5-5 Estimated Treatment Cost for ISDS at 500,000 cy/yr (1 cy = 1 ton)
(Assumes 10% of sediment to HYDRO-SEP and 90% of sediment to ORG-X (35% solids); Capital Cost (FCI) = $17.5 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
Solvent(s)	lb.	$0.52	2,070,000	$1,076,400	$2.15
H&S Clothing	clothing set	$25	6,935	$173,375	$0.35
Utilities:					
Electricity	kWhr	0.09	36,000,000	$3,240,000	$6.48
Steam	1,000 lb	4.59	500,000	$2,295,000	$4.59
Fuel Oil	MMBtu	3.83	26,000	$99,580	$0.20
Cooling Water	1,000 gal	0.13	6,087,405	$791,363	$1.58
Disposal Costs:					
Transportation of Organic Waste	lb.	0.02	10,250,000	$205,000	$0.41
Incineration of Organic Waste	lb.	0.2	10,250,000	$2,050,000	$4.10
Labor:/ with 35% benefits					
Operators (12)	hr.	$27.00	26,280	$709,560	$1.42
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$0.63
Site Manager (1)	hr.	$50.00	2,190	$109,500	$0.22
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.20
Mechanics (2)	hr.	$36.00	4,380	$157,680	$0.32
Laborers (3)	hr.	$20.00	6,570	$131,400	$0.26
Chemists (2)	hr.	$40.00	4,380	$175,200	$0.35
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.14
Subtotal				$1,767,330.00	$3.54
Maintenance Supplies, 5% of FCI/yr				$875,000.00	$1.75
Operating Supplies, 1% of FCI/yr				$175,000.00	$0.35
Plant Overhead Costs, 60% of Labor				$1,060,398.00	$2.12
Depreciation, 10% of FCI/yr				$1,750,000.00	$3.50
TOTAL TREATMENT COST				$15,558,446.00	$31.12

* Dioxin < 1 ppb is not regulated. If dioxin > 1ppb, it is regulated and costs $2.00/lb and additional cost is $36.90/ton.

Table 5–5 Estimated Treatment Cost for ISDS at 500,000 cy/yr (1 cy ≅ 1 ton)

(Assumes 10% of sediment to HYDRO–SEP and 90% of sediment to ORG–X (35% solids); Capital Cost (FCI) = $17.5 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
Solvent(s)	lb.	$0.52	2,070,000	$1,076,400	$2.15
H&S Clothing	clothing set	$25	6,935	$173,375	$0.35
Utilities:					
Electricity	kWhr	0.09	36,000,000	$3,240,000	$6.48
Steam	1,000 lb	4.59	500,000	$2,295,000	$4.59
Fuel Oil	MMBtu	3.83	26,000	$99,580	$0.20
Cooling Water	1,000 gal	0.13	6,087,405	$791,363	$1.58
Disposal Costs:					
Transportation of Organic Waste	lb.	0.02	10,250,000	$205,000	$0.41
Incineration of Organic Waste	lb.	0.2	10,250,000	$2,050,000	$4.10
Labor:/ with 35% benefits					
Operators (12)	hr.	$27.00	26,280	$709,560	$1.42
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$0.63
Site Manager (1)	hr.	$50.00	2,190	$109,500	$0.22
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.20
Mechanics (2)	hr.	$36.00	4,380	$157,680	$0.32
Laborers (3)	hr.	$20.00	6,570	$131,400	$0.26
Chemists (2)	hr.	$40.00	4,380	$175,200	$0.35
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.14
Subtotal				$1,767,330.00	$3.54
Maintenance Supplies, 5% of FCI/yr				$875,000.00	$1.75
Operating Supplies, 1% of FCI/yr				$175,000.00	$0.35
Plant Overhead Costs, 60% of Labor				$1,060,398.00	$2.12
Depreciation, 10% of FCI/yr				$1,750,000.00	$17.50
TOTAL TREATMENT COST				$15,558,446.00	$45.12

* Dioxin <1 ppb is not regulated. If dioxin >1ppb, it is regulated and costs $2.00/lb and additional cost is $36.90/ton.

Table 5-6 Estimated Treatment Cost for ISDS at 500,000 cy/yr (1 cy = 1 ton)

(Assumes 10% of sediment to HYDRO-SEP and 90% of sediment to ORG-X and SOLFIX (35% solids); Capital Cost (FCI) = $20 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
Solvent(s)	lb.	$0.52	2,070,000	$1,076,400	$2.15
H&S Clothing	clothing set	$25	6,935	$173,375	$0.35
Cement	tons	$100	26,250	$2,625,000	$5.25
Additives	lb.	$1	500,000	$500,000	$1.00
Misc.					
Utilities:					
Electricity	kWhr	0.09	48,000,000	$4,320,000	$8.64
Steam	1,000 lb	4.59	500,000	$2,295,000	$4.59
Fuel Oil	MMBtu	3.83	26,000	$99,580	$0.20
Cooling Water	1,000 gal	0.13	6,087,405	$791,363	$1.58
Disposal Costs:					
Transportation of Organic Waste	lb.	0.02	10,250,000	$205,000	$0.41
Incineration of Organic Waste	lb.	0.2	10,250,000	$2,050,000	$4.10
Labor:/ with 35% benefits					
Operators (16)	hr.	$27.00	35,040	$946,080	$1.89
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$0.63
Site Manager (1)	hr.	$50.00	2,190	$109,500	$0.22
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.20
Mechanics (3)	hr.	$36.00	6,570	$236,520	$0.47
Laborers (3)	hr.	$20.00	6,570	$131,400	$0.26
Chemists (2)	hr.	$40.00	4,380	$175,200	$0.35
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.14
Subtotal				$2,082,690.00	$4.16
Maintenance Supplies, 5% of FCI/yr				$1,000,000.00	$2.00
Operating Supplies, 1% of FCI/yr				$200,000.00	$0.40
Plant Overhead Costs, 60% of Labor				$1,249,614.00	$2.50
Depreciation, 10% of FCI/yr				$2,000,000.00	$6.00
TOTAL TREATMENT COST				$20,668,021.65	$41.33

* Dioxin < 1 ppb is not regulated. If dioxin > 1ppb, it is regulated and costs $2.00/lb and additional cost is $36.90/ton.

Table 5–6 Estimated Treatment Cost for ISDS at 500,000 cy/yr (1 cy ≃ 1 ton)

(Assumes 10% of sediment to HYDRO–SEP and 90% of sediment to ORG–X and SOLFIX (35% solids); Capital Cost (FCI) = $20 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
Solvent(s)	lb.	$0.52	2,070,000	$1,076,400	$2.15
H&S Clothing	clothing set	$25	6,935	$173,375	$0.35
Cement	tons	$100	26,250	$2,625,000	$5.25
Additives	lb.	$1	500,000	$500,000	$1.00
Misc.					
Utilities:					
Electricity	kWhr	0.09	48,000,000	$4,320,000	$8.64
Steam	1,000 lb	4.59	500,000	$2,295,000	$4.59
Fuel Oil	MMBtu	3.83	26,000	$99,580	$0.20
Cooling Water	1,000 gal	0.13	6,087,405	$791,363	$1.58
Disposal Costs:					
Transportation of Organic Waste	lb.	0.02	10,250,000	$205,000	$0.41
Incineration of Organic Waste	lb.	0.2	10,250,000	$2,050,000	$4.10
Labor:/ with 35% benefits					
Operators (16)	hr.	$27.00	35,040	$946,080	$1.89
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$0.63
Site Manager (1)	hr.	$50.00	2,190	$109,500	$0.22
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.20
Mechanics (3)	hr.	$36.00	6,570	$236,520	$0.47
Laborers (3)	hr.	$20.00	6,570	$131,400	$0.26
Chemists (2)	hr.	$40.00	4,380	$175,200	$0.35
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.14
Subtotal				$2,082,690.00	$4.16
Maintenance Supplies, 5% of FCI/yr				$1,000,000.00	$10.00
Operating Supplies, 1% of FCI/yr				$200,000.00	$2.00
Plant Overhead Costs, 60% of Labor				$1,249,614.00	$2.50
Depreciation, 10% of FCI/yr				$2,000,000.00	$20.00
TOTAL TREATMENT COST				$20,668,021.65	$66.93

* Dioxin <1 ppb is not regulated. If dioxin >1ppb, it is regulated and costs $2.00/lb and additional cost is $36.90/ton.

Table 5-7 Estimated Treatment Cost for ISDS at 100,000 cy/yr (1 cy = 1 ton)
(Assumes 10% of sediment to HYDRO-SEP and 90% of sediment to ORG-X and SOLFIX (35% solids); Capital Cost (FCI) = $9 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
Solvent(s)	lb.	$0.52	414,000	$215,280	$2.15
H&S Clothing	clothing set	$25	6,935	$173,375	$1.73
Cement	tons	$100	5,250	$525,000	$5.25
Additives	lb.	$1	100,000	$100,000	$1.00
Misc.					
Utilities:					
Electricity	kWhr	0.09	12,000,000	$1,080,000	$10.80
Steam	1,000 lb	4.59	100,000	$459,000	$4.59
Fuel Oil	MMBtu	3.83	13,000	$50,000	$0.50
Cooling Water	1,000 gal	0.13	1,217,481	$155,384	$1.55
Disposal Costs:					
Transportation of Organic Waste	lb.	0.02	2,050,000	$41,000	$0.41
Incineration of Organic Waste	lb.	0.2	2,050,000	$410,000	$4.10
Labor:/ with 35% benefits					
Operators (16)	hr.	$27.00	35,040	$946,080	$9.46
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$3.15
Site Manager (1)	hr.	$50.00	2,190	$109,500	$1.10
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.99
Mechanics (3)	hr.	$36.00	6,570	$236,520	$2.37
Laborers (3)	hr.	$20.00	6,570	$131,400	$1.31
Chemists (2)	hr.	$40.00	4,380	$175,200	$1.75
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.70
Subtotal				$2,082,690.00	$20.83
Maintenance Supplies, 5% of FCI/yr				$450,000.00	$4.50
Operating Supplies, 1% of FCI/yr				$90,000.00	$0.90
Plant Overhead Costs, 60% of Labor				$1,249,614.00	$12.50
Depreciation, 10% of FCI/yr				$900,000.00	$9.00
TOTAL TREATMENT COST				$7,981,343.00	$79.81

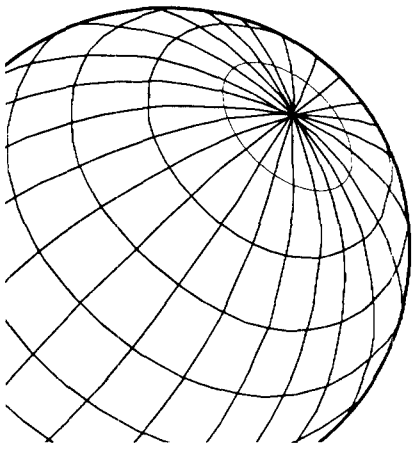
* Dioxin <1 ppb is not regulated. If dioxin >1ppb, it is regulated and costs $2.00/lb and additional cost is $36.90/ton.

Table 5–7 Estimated Treatment Cost for ISDS at 100,000 cy/yr (1 cy ≃ 1 ton)

(Assumes 10% of sediment to HYDRO–SEP and 90% of sediment to ORG–X and SOLFIX (35% solids); Capital Cost (FCI) = $9 million.

ITEM	Unit	Unit Cost ($)	No. of Units/ Year	Annual Cost $/Year	Unit Cost $/ton
Solvent(s)	lb.	$0.52	414,000	$215,280	$2.15
H&S Clothing	clothing set	$25	6,935	$173,375	$1.73
Cement	tons	$100	5,250	$525,000	$5.25
Additives	lb.	$1	100,000	$100,000	$1.00
Misc.					
Utilities:					
Electricity	kWhr	0.09	12,000,000	$1,080,000	$10.80
Steam	1,000 lb	4.59	100,000	$459,000	$4.59
Fuel Oil	MMBtu	3.83	13,000	$50,000	$0.50
Cooling Water	1,000 gal	0.13	1,217,481	$155,384	$1.55
Disposal Costs:					
Transportation of Organic Waste	lb.	0.02	2,050,000	$41,000	$0.41
Incineration of Organic Waste	lb.	0.2	2,050,000	$410,000	$4.10
Labor:/ with 35% benefits					
Operators (16)	hr.	$27.00	35,040	$946,080	$9.46
Shift Supervisor (4)	hr.	$36.00	8,760	$315,360	$3.15
Site Manager (1)	hr.	$50.00	2,190	$109,500	$1.10
Engineer (1)	hr.	$45.00	2,190	$98,550	$0.99
Mechanics (3)	hr.	$36.00	6,570	$236,520	$2.37
Laborers (3)	hr.	$20.00	6,570	$131,400	$1.31
Chemists (2)	hr.	$40.00	4,380	$175,200	$1.75
Clerks (2)	hr.	$16.00	4,380	$70,080	$0.70
Subtotal				$2,082,690.00	$20.83
Maintenance Supplies, 5% of FCI/yr				$450,000.00	$4.50
Operating Supplies, 1% of FCI/yr				$90,000.00	$0.90
Plant Overhead Costs, 60% of Labor				$1,249,614.00	$12.50
Depreciation, 10% of FCI/yr				$900,000.00	$9.00
TOTAL TREATMENT COST				$7,981,343.00	$79.81

* Dioxin <1 ppb is not regulated. If dioxin >1ppb, it is regulated and costs $2.00/lb and additional cost is $36.90/ton.



SECTION 6.0

TREATMENT PROCESSES FOR PILOT-SCALE PLANT TEST

This section has already been submitted with the March 15, 1996 proposal and has been edited for this report.

6.1 PILOT-SCALE PLANT TEST DESCRIPTION

The pilot-scale testing will be performed using smaller but similar equipment to simulate the unit operations of the full-scale operation. The objective is to make the various products from 25 cubic yards (about 100, 55-gallon drums) of sediment from Newtown Creek, which we understand is representative of the variation in dredged sediments throughout the harbor.

Figure 6-1 illustrates the processes to be evaluated for M&E's ISDS. The pre-treatment section will simulate the water decanting, scalping, screening, and pressing, as well as the oversized particle water washing unit operations. The HYDRO-SEP℠ washing of the oversize (estimated at less than one percent, but could range up to 34.4 percent for the gravel at + ¼-inch) includes a trommel with wedge wire screening to deagglomerate and wash the fines off of the oversized particles. The fines are filtered and combined with the main fines stream. The HYDRO-SEP™ pilot equipment is presented as an option (at additional cost) and is not in the pricing because it may not be required. The oversized particles can be easily power-washed with cold or hot water to produce sample quantities to determine if they are clean. A crusher can be provided as a backup to the soil washing in case the oversized particles are not cleanable with cold or hot water.

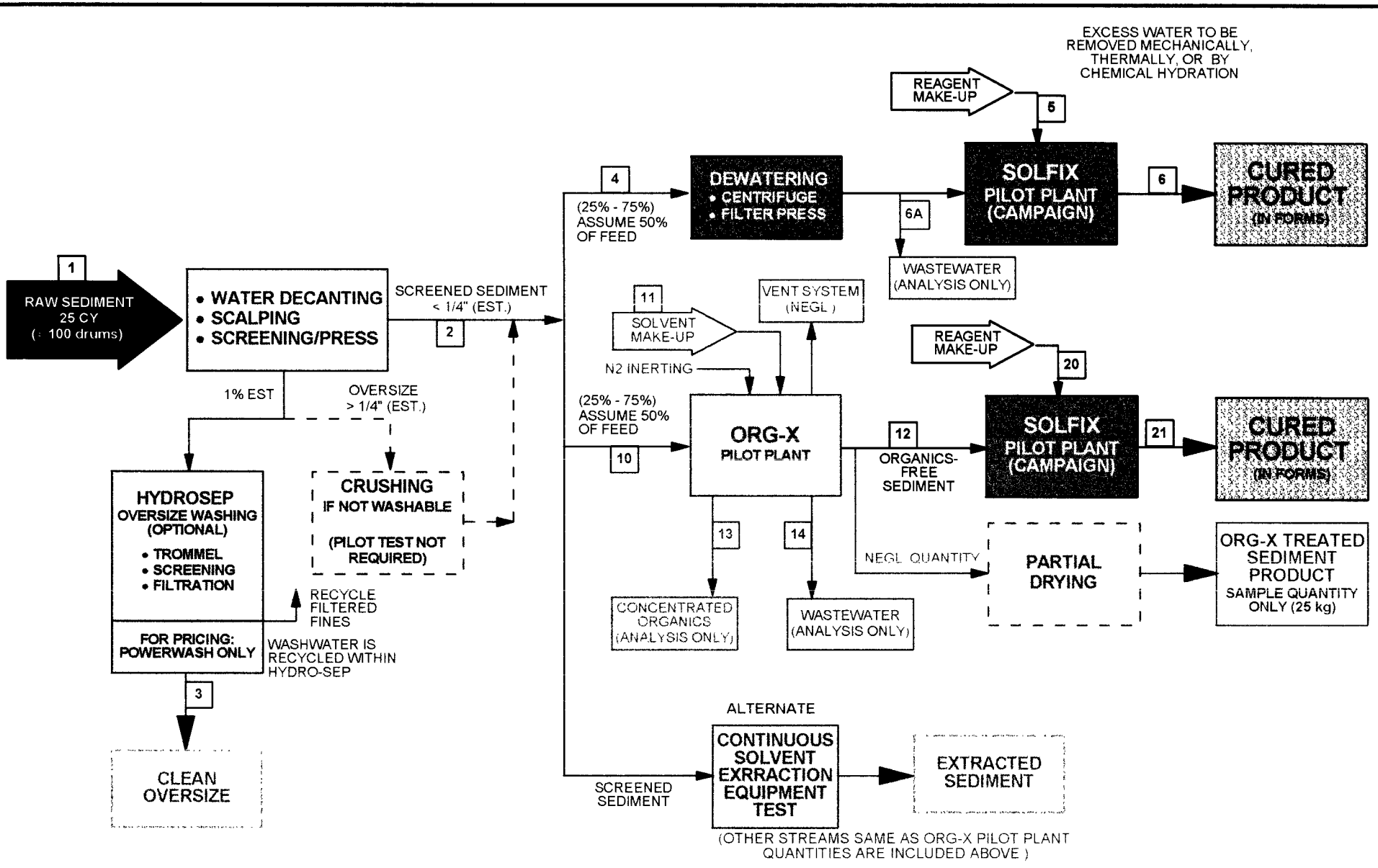
The screened sediment will be split approximately in half for processing directly to the SOLFIX equipment and to the ORG-X plus SOLFIX equipment train which is batch and semi-continuous. Also, M&E plans to test a small, continuous solvent extraction equipment (greater than three stages) with less than one drum of sediment for design purposes. These other special tests are also planned to improve percent removal of most contaminants:

- ❑ Use warm/hot recycle solvent by reduced cooling in recovery system;
- ❑ Use a higher solvent-to-sediment ratio; and
- ❑ Use a mixture of closely related solvents with the same equipment.

The ORG-X output product can also be partially dried to adjust the moisture content of the sample for BNL.

A material balance for the pilot operation is provided in Table 6-1 for 1 cy/day of raw sediment. The calculations are based on the bench-scale treatability test performed on the same Newtown Creek sediments.

The ORG-X pilot plant will process approximately two drums per day, (almost one cubic yard/day) in an 8-10 hour shift. It will produce wet sediment for the SOLFIX pilot equipment. The solvent may be recovered periodically and reused. The ORG-X process normally generates concentrated organics, which contain small amounts of solvent to reduce the viscosity or make it flowable. This will be disposed off-site via incineration. Alternately, the solvent from the pilot plant operation can also be disposed off-site via incineration.



Metcalf & Eddy

FIGURE 6-1

PILOT-SCALE SYSTEM FOR ISDS PROCESS PRODUCING THREE DIFFERENT PRODUCTS

UTILITIES:

- STEAM BOILER
- COOLING WATER TOWER
- POWER GENERATOR
- AIR COMPRESSOR
- N2 INERTING SYSTEM

KEY: MAIN PROCESSES

- PRE-TREATMENT WITH HYDRO-SEP OF CLEAN OVERSIZE
- ORG-X SOLVENT EXTRACTION OF ORGANICS FROM SEDIMENT
- SOLFIX FIXATION OF METALS/ORGANICS AND PRODUCT MANUFACTURING

TABLE 6-1
BROOKHAVEN NATIONAL LABORATORY
PILOT PLANT STUDY MASS BALANCE
Plant Capacity = 1 CY/Day

Stream No.	Description	Solid Flow Rate, lb/day	Water Flow Rate, lb/day	Slurry Flow Rate, lb/day	Solvent Flow Rate, lb/day	Organic Flow Rate, lb/day	Total Flow Rate, lb/day
1	Raw Sediment Feed	727.65	1351.35	2079.00	N/A	14.55	2093.55
2	Screened Sediment	720.37	1349.53	2069.90	N/A	14.55	2084.46
3	Clean Oversize	7.28	1.82	9.10	N/A	N/A	9.10
4	Feed to SOLFIX only	360.19	674.77	1034.95	N/A	7.28	1042.23
5	Reagents to SOLFIX (minimum)	162.08	N/A	N/A	N/A	N/A	162.08
6	SOLFIX Stabilized product	783.41	N/A	N/A	N/A	7.28	790.68
6A	Excess wastewater to be removed	N/A	413.63	N/A	N/A	N/A	413.63
11	Makeup Solvent(s)	N/A	N/A	N/A	2.07	N/A	2.07
12	ORG-X Treated Sediment	359.29	206.59	565.88	N/A	N/A	565.88
13	Concentrated Organics/Waste	0.90	N/A	N/A	2.07	7.28	10.25
14	Process Wastewater from ORG-X	N/A	468.18	468.18	N/A	N/A	468.18
20	Reagents to ORG-X/SOLFIX	53.89	N/A	N/A	N/A	N/A	53.89
21	ORG-X/SOLFIX Stabilized product	619.77	N/A	N/A	N/A	N/A	619.77

Basis:

Initial sediment moisture content, % w/w =	65.0	
Sediment solid sp. gr. @100% basis =	2.2	(assumed)
Sediment apparent sp.gr. =	1.24	
Organics concentration in sediment, % =	2	@ dry basis (assumed)
Oversize fraction, % of feed solid =	1	@ dry basis (assumed)
Moisture in oversize fraction, % =	20	(assumed)
Feed to Solfix process w/o Org-X, % =	50	(assumed)
Reagents addition rate for SOLFIX stabilization =	45%	@ 100% input dry solid basis
Reagents addition rate for ORG-X/SOLFIX stabilization =	15%	@ 100% input dry solid basis
Hydrated and porewater in stabilized product =		50% (assumed @ input total dry solid basis)
Solvent sp. gr. =	0.87	
Makeup solvent addition rate =	0.2%	of total sediment
Sediment loss in concentrated organics =	0.25%	of sediment @ 100% dry basis

Notes:

1. Organics concentration in oversize fraction is assumed to be negligible.

In addition, excess water not needed by the SOLFIX process is removed and combined with the decanted water from the pre-treatment step. As an alternate, this excess water can be removed before the ORG-X process by centrifuging or filtration. The operation of the pilot plant will contribute to evaluating these alternatives. This wastewater will be analyzed for future treatment in the full-scale design.

The SOLFIX equipment will be campaigned to directly stabilize the screened sediment and to stabilize the "organic-free" sediment. Both of these steps will produce a product that is cured in forms. The crushing and extrusion machines will not be simulated, since the design of this conventional large-scale equipment is straightforward. The stabilization will require approximately 15 percent of cement/additives (reagent[s]) on a dry mass basis. This quantity will be varied to attain various

engineering properties for the product and be optimized to attain a mutually-agreed performance goal. The raw screened sediment will require more reagent(s) (up to 45 percent on a dry mass basis with some dewatering) because of the higher water content.

6.2 OPTIMAL WATER CONTENT IN SEDIMENTS

In order to coordinate the sediment dredging and sediment treatment activities, it is important to know the optimal water content in the sediment that minimizes overall dredging/treatment costs. The answer is estimated at 55 - 70 percent water for the ISDS. Such sediment will contain no free water and behaves like a viscous fluid to facilitate material handling. This low water content is not achieved by conventional dredging alone, but could require the use of two novel dredging techniques, such as the cable arm clamshell bucket (from Cable Arm, Inc.) and the dry DREdge (from DRE Technologies, Inc.) Both of these techniques practically eliminate free water and produce a higher solids to water ratio in the dredged sediment than by use of conventional clamshell dredging. Moreover, the turbidity in the dredging area is significantly reduced, and the need to re-dredge an area to remove contaminants that are redeposited from the turbid water, is significantly reduced.

The optimal water content for the sediment, that is treated with both the ORG-X and SOLFIX sequential process, is dependent on the specific process alternative and several design variables that affect both the capital cost and operating cost. For example, the excess water to attain the optimal amount for SOLFIX could be removed before or after ORG-X process either mechanically or thermally. These alternatives, as well as the applicable design variables, can be studied with a process simulation program, after the pilot data is obtained and during the preliminary engineering design for the production/full-scale designs. Furthermore, the desirable water content for the downstream operations may be constrained by some other parameter or requirement that requires a specific water content in order to make the overall process operate better.

We saw an example of this during the bench-scale tests when it was found that dewatering the sediment with a centrifuge to remove an additional five percent of the water (from a 67 percent water content) produced a fines/gel phase that made it more difficult to extract the organics with the solvent. Moreover, the material handling (pumping, mixing, etc.) problems and fouling of processing equipment increase as the percent water decreases. Therefore, it was decided to perform the solvent extraction at the initial water content to avoid these difficulties.

6.3 PILOT-SCALE PLANT LOCATION AND REQUIREMENTS

In order to perform the pilot-scale tests, M&E prefers to use a site of our choice. M&E will choose its own site because of some special requirements that include:

- ❑ At least a 40' x 40' area in a building that has a Hazardous Electrical Classification and is well ventilated. This is required because of the NFPA regulations for flammable solvents. This space should be sufficient for both the operation and maintenance. The layout is flexible and will be finalized after project award.

- ❑ A concrete floor with a containment system that includes a sump/drain to collect any potential spills.

- ❑ Adequate building lighting and HVAC that meets various codes.

M&E will also provide the following which are included in the pricing of this proposal:

- ❑ a small portable boiler or Dowtherm heater for the ORG-X process.

- ❑ a small water cooling tower;

- ❑ small air compressor for general purpose;

- ❑ small N_2 cylinders for inerting the ORG-X system;

- ❑ small generator for 460V motors;
- ❑ Electrical power at 110V/220V for some operations up to 100A.
- ❑ City water at approximately 5 to 10 GPM for general purposes.
- ❑ Separate toilets for men and women.
- ❑ one personnel and one laboratory trailer for the M&E activities. These can be located outside the building and can be powered from either the building electrical system or the M&E generator.

M&E plans to have the following seven people on-site full-time for approximately 4 to 7 weeks for the safe and legal operation of plant:

- ❑ project manager
- ❑ process manager/engineer
- ❑ operating foreman and health & safety officer
- ❑ three operators
- ❑ one laboratory technician

We understand that BREP/MSA is currently developing a plant and seeking permits for siting and operating the pilot-scale test facilities. M&E intends to obtain its own permits but may request assistance from BREP/MSA.

M&E will be responsible for arranging the lawful disposal of all products/wastes/residuals - materials from the pilot scale tests, under an EPA generator number to be provided by BNL. M&E will prepare the necessary manifests and paperwork for signature by BNL representatives.

6.4 PILOT-SCALE PLANT PROJECT EXECUTION PLANS

Project Work Plan

As was provided for in the bench-scale test program, M&E will prepare a specific work plan for this test. This plan will be submitted early in the project for review and coordination with BNL's plans. The plan will typically include the following sections:

- ❑ Introduction of Project Work Plan
  - Background
  - Project Objectives
- ❑ Project Description
  - Scope of Work
  - Project Organization
  - Project Schedule
  - Process Overview and Drawing(s)
- ❑ Description of Work Activities
  - Site Preparation and Mobilization
  - Sediment Receipt and Storage
  - Pilot Scale Processing
    - Mobilize and Assemble Plant
    - Unit Operations Start-up
    - Systems Operations Start-up
    - Trial Processing
    - Sediment Processing
    - Process Monitoring & Data Collection
    - Decontamination
  - Sampling and Analysis
    - Analytical Testing
    - System Controls
    - System Performance Goals
    - Management of Treated Sediment
  - Permitting
  - Reporting/Communications
- ❑ Fugitive Emission Control

Health and Safety Plan

As described in the original proposal, the Health and Safety Plan will typically include, at a minimum, the following items:

- ❑ Introduction for Health and Safety Plan
- ❑ Site/Task/Operation Safety and Health Risk Analysis
- ❑ Key Personnel and Responsibilities
- ❑ Personnel Training Requirements
- ❑ Medical Surveillance Requirements
- ❑ Personal Protective Equipment
- ❑ Frequency and Types of Personal Air Monitoring/Sampling
- ❑ Site Control Measures

- ❑ Decontamination Plan
- ❑ Emergency Response/Contingency Plan
- ❑ Special Safety Procedures

Quality Assurance/Quality Control Plan

The Quality Assurance/Quality Control (QA/QC) plan will be prepared only for the data collected and samples analyzed by M&E. M&E will typically collect sufficient process data for preparing material balances and proposing the preliminary full-scale design. The list, which will be refined in the plans, includes:

- ❑ Specific gravity
- ❑ pH
- ❑ Conductivity
- ❑ Flow rates
- ❑ Temperatures
- ❑ Pressures
- ❑ Percent solvent(s)
- ❑ Total organics (TOC)
- ❑ Unconfined compressive strength

We are assuming that BNL will provide additional analytical results as was done for the bench-scale tests. This includes the following for all the input/output stream samples submitted to BNL:

- ❑ Total or toxic metals
- ❑ TCLP toxic metals
- ❑ Dioxins/furans
- ❑ Organic chlorine pesticides
- ❑ Polynuclear Aromatic Hydrocarbons (PAHs)
- ❑ PCB isomers

For process control purposes, M&E plans to send some samples for limited testing by an outside laboratory, which can provide results in less than a 24-hour turnaround. The results will be incorporated into the final report. The report can be updated to include the BNL analytical results if not made available by late September 1996.

The QA/QC plan, which will be submitted early after award, will contain the following:

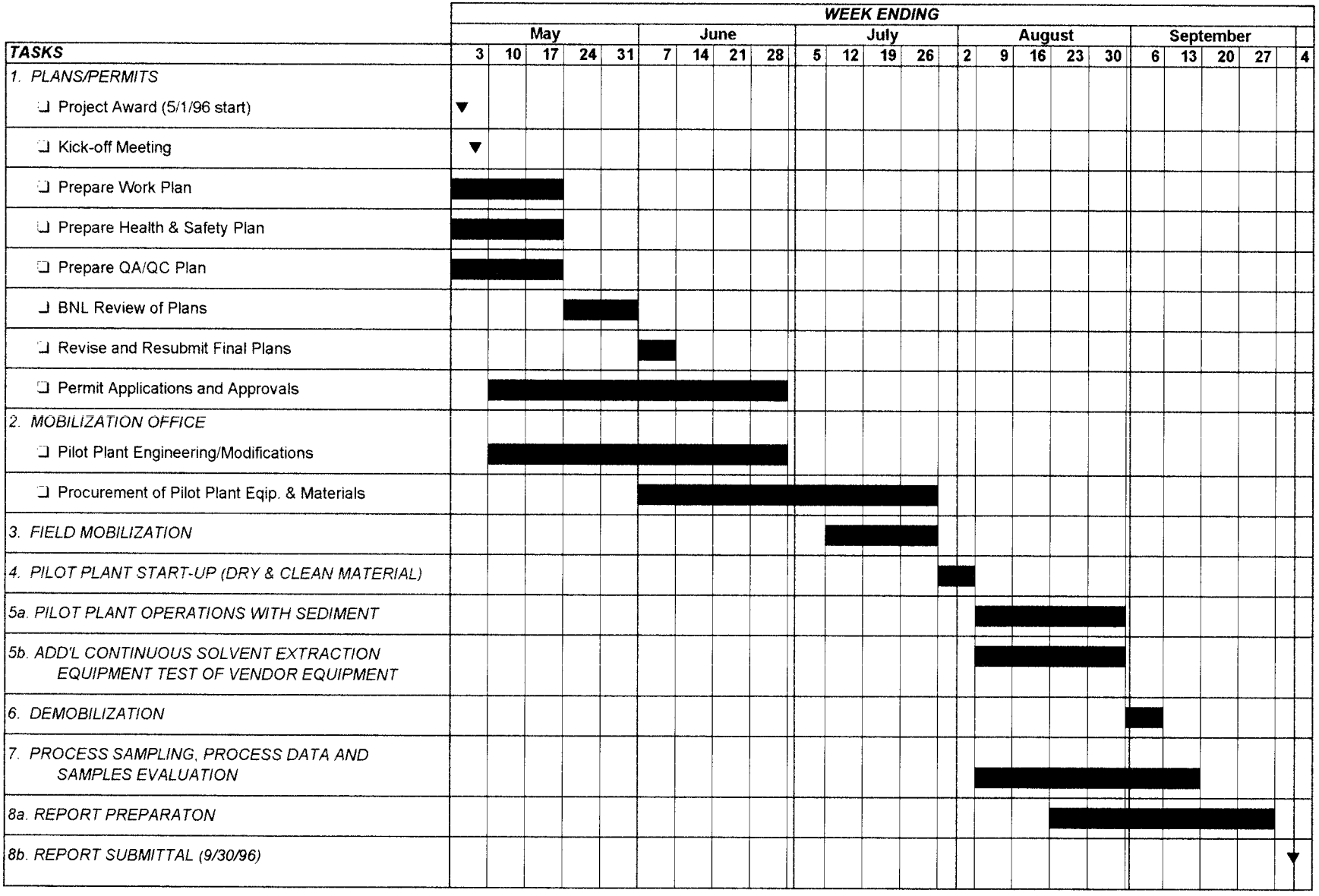
- ❑ Introduction for QA/QC
  - Project Scope and Purpose
  - Site Background
  - System Performance Goal
- ❑ Project Organization and Responsibilities
- ❑ Objectives for Measurement of Data
  - Analytical Data Levels
  - Data Quality Criteria
- ❑ Sampling Procedures
  - Sampling Objectives, Locations and Frequency
  - Sample Collection
  - Equipment Decontamination
  - Sample Packaging, Storage, and Shipping
  - Sample Custody
- ❑ Recordkeeping
- ❑ Equipment Calibration Procedures and Frequencies
- ❑ Analytical Procedures
- ❑ Data Management for Field and Laboratory
- ❑ Internal Quality Control Checks
- ❑ Quality Assurance Review

6.5 PILOT-SCALE PLANT PROJECT SCHEDULE

M&E has devised a fast-track approach to meet the shorter six-month time period for implementing the pilot-scale test of the proposed technologies. Figure 6-2 illustrates the main tasks to be completed from project award on May 1, 1996 to report submission on September 30, 1996.

The project kick-off meeting will be held early to coordinate the project activities, agree on the optional items, and resolve any outstanding issues.

After the initial kick-off and project coordination meeting, the work plan, health and safety plan and QA/QC plan will be prepared and submitted in mid-May 1996 for BNL review. As BNL reviews the plans, M&E will continue work to apply for permits (optional), finalize engineering plans,



Metcalf & Eddy

FIGURE 6-2
SCHEDULE FOR PHASE II PILOT-SCALE PLANT TEST PROGRAM

procure and schedule for the delivery of equipment and materials to the selected demonstration site. Equipment will be mobilized to site in July 1996 and readied for start-up with water and/or clean material by August 2, 1996. BNL will also deliver the dredged sediment to the site by this date.

The pilot-scale systems will be operated in August to process the 25 cubic yards of Newtown Creek dredge sediment. Both process data as well as samples will be collected to evaluate the performance and to continue/revise the preliminary designs required in the report. BNL will be given the required samples of the products, effluent waste streams, reagents and residual solids. M&E will also simultaneously conduct an additional test of a continuous solvent extraction pilot equipment to determine the performance of this critical equipment. A draft of our report will be prepared and submitted on September 30, 1996.

6.6 PILOT-SCALE TREATMENT REPORT

As stated in the instructions of Enclosure A of the Request for Revised Pricing Proposal, M&E will submit the draft pilot-scale treatment report within one month after completion of pilot-scale work. It will contain a description of the work, "...including process methods, reagents, end-products, identification of the kinds of sediments suitable for treatment, process flowcharts and other tables/graphics needed to demonstrate the effectiveness" of the ISDS process."

As requested, M&E will provide the information requested in the section on the Potential for Production and Full-Scale Operations. The report will provide information on the continuation of preliminary engineering for business planning purposes. No detailed engineering will be provided.

M&E will incorporate the BNL analytical results in the report if received by mid-September 1996. Otherwise, it can be added to the report after the submittal due date on September 30, 1996.

APPENDIX A-1

NJ REVISED CLEAN-UP CRITERIA

State of New Jersey
Department of Environmental Protection and Energy

Robert C. Shinn, Jr.
Commissioner

February 8, 1994

MEMORANDUM

TO: Site Remediation Program Staff

FROM: Lance Miller, Assistant Commissioner
Site Remediation Program

SUBJECT: Revised Soil Cleanup Criteria

Soil Cleanup Criteria (SCC) were initially distributed to Site Remediation Program Staff in January 1993. The SCC were revised in March 1993 and contained in the April 1993 issue of the Site Remediation News. Since that time, there have been toxicity factor changes as well as the identification of computational and typographical errors for several SCC compounds. These changes and corrections have been made resulting in a revised SCC list which is attached.

Thirty eight (38) criteria encompassing 31 compounds are affected. The majority of changes are to the impact to groundwater SCC. Sixteen (16) SCC have increased, 19 SCC have decreased and criteria for 2,4-/2,6-dinitrotoluene (mixture) have been added. Please refer to the footnotes contained in the SCC list for more detail.

It is important to note that SCC for eight (8) compounds have decreased by at least an order of magnitude. These compounds are:

acrylonitrile	(impact to groundwater criterion)
benzo(b)fluoranthene	(impact to groundwater criterion)
1,2-dichloroethene	(impact to groundwater criterion)
heptachlor	(impact to groundwater criterion)
hexachlorobutadiene	(residential and non-residential direct contact criteria)
methoxychlor	(impact to groundwater criterion)
methylene chloride	(impact to groundwater criterion)
toxaphene	(impact to groundwater criterion)

The purpose and function of the SCC remains the same - to provide guidance in establishing site-specific cleanup levels. Other factors such as environmental impacts, site-specific conditions and background levels may be considered which could result in a site-specific cleanup level which differs from the SCC.

If you have any questions regarding the above or other cleanup standards issues, please bring them to the attention of your Bureau or Element managers. Thank you for your cooperation.

attachment

Soil Cleanup Criteria (mg/kg)
(Last Revised - 2/3/94)

This listing represents the combination of Tables 3-1 and 7-1 from the Department of Environmental Protection and Energy's February 3, 1992 proposed rule entitled Cleanup Standards for Contaminated Sites, N.J.A.C. 7:26D, with noted corrections based upon errors identified by the Department during or subsequent to the comment period as well as new toxicological information obtained since the rule proposal. Please refer to the respective footnotes for more detail. Notwithstanding, where the following criteria are based on human health impacts, the Department shall still consider environmental impacts when establishing site specific cleanup criteria. This along with other site specific factors including background conditions may result in site specific cleanup criteria which differ from the criteria listed below. Therefore, this list shall not be assumed to represent approval by the Department of any remedial action or to represent the Department's opinion that a site requires remediation.

Note: Material bracketed [thus] is deleted and material underlined thus is added

Contaminant	CASRN	Residential Direct Contact Soil Cleanup Criteria(a)(b)	Non Residential Direct Contact Soil Cleanup Criteria(a)(b)	Impact to Ground water Soil Cleanup Criteria(b)
Acenaphthene	83-32-9	3400	10000(c)	100
Acetone	67-64-1	1000(d)	1000(d)	[50] 100(i)
Acrylonitrile	107-13-1	1	5	[100] 1(i)
Aldrin	309-00-2	0.040	0.17	50
Anthracene	120-12-7	10000(c)	10000(c)	[500] 100(i)
Antimony	7440-36-0	14	340	(h)
Arsenic	7440-38-2	[2(f)] 20(e)	[2(f)] 20(e)	(h)
Barium	7440-39-3	700	47000(n)	(h)
Benzene	71-43-2	3	13	1
3,4-Benzofluoranthene (Benzo(b)fluoranthene)	205-99-2	0.9	4	[500] 50(i)
Benzo(a)anthracene	56-55-3	0.9	4	500
Benzo(a)pyrene (BaP)	50-32-8	0.66(f)	0.66(f)	100
Benzo(k)fluoranthene	207-08-9	0.9	4	500
Benzyl Alcohol	100-51-6	10000(c)	10000(c)	50
Beryllium	7440-41-7	1(f)	1(f)	(h)
Bis(2-chloroethyl) ether	111-44-4	0.66(f)	3	[1] 10(j)
Bis(2-chloroisopropyl) ether	39638-32-9	2300	10000(c)	10
Bis(2-ethylhexyl) phthalate	117-81-7	49	210	100
Bromodichloromethane (Dichlorobromomethane)	75-27-4	[5] 11(g)	[22] 46(g)	1
Bromoform	75-25-2	86	370	1
Bromomethane	74-83-9	79	1000(d)	1
2-Butanone (MEK)	78-93-3	1000(d)	1000(d)	50
Butylbenzyl phthalate	85-68-7	1100	10000(c)	100
Cadmium	7440-43-9	1	100	(h)

Soil Cleanup Criteria (mg/kg)
(Last Revised - 2/3/94)

Carbon tetrachloride	56-23-5	2(k)	4(k)	1
4-Chloroaniline	106-47-8	230	4200	(r)
Chlorobenzene	108-90-7	37	680	1
Chloroform	67-66-3	19(k)	28(k)	1
4-Chloro-3-methyl phenol (p-Chloro-m-cresol)	59-50-7	10000(c)	10000(c)	100
Chloromethane	74-87-3	520	1000(d)	10
2-Chlorophenol	95-57-8	280	5200	[50] 10(j)
Chrysene	218-01-9	9	40	500
Copper	7440-50-8	600(m)	600(m)	(h)
Cyanide	57-12-5	1100	21000(o)	(h)
4,4'-DDD (p,p'-TDE)	72-54-8	3	12	[100] 50(i)
4,4'-DDE	72-55-9	2	9	[100] 50(i)
4,4'-DDT	50-29-3	2	9	[100] 500(i)
Dibenz(a,h)anthracene	53-70-3	0.66(f)	0.66(f)	[500] 100(j)
Dibromochloromethane (Chlorodibromomethane)	124-48-1	110	1000(d)	1
Di-n-butyl phthalate	84-74-2	5700	10000(c)	100
Di-n-octyl phthalate	117-84-0	1100	10000(c)	100
1,2-Dichlorobenzene	95-50-1	5100	10000(c)	50
1,3-Dichlorobenzene	541-73-1	5100	10000(c)	100
1,4-Dichlorobenzene	106-46-7	570	10000(c)	100
3,3'-Dichlorobenzidine	91-94-1	2	6	100
1,1-Dichloroethane	75-34-3	570	1000(d)	[1] 10(i)
1,2-Dichloroethane	107-06-2	6	24	1
1,1-Dichloroethene	75-35-4	8	150	10
1,2-Dichloroethene (trans)	156-60-5	1000(d)	1000(d)	50
1,2-Dichloroethene (cis)	156-59-2	79	1000(d)	[50] 1(i)
2,4-Dichlorophenol	120-83-2	170	3100	10
1,2-Dichloropropane	78-87-5	10	43	(r)
1,3-Dichloropropene (cis and trans)	542-75-6	4	5(k)	1
Dieldrin	60-57-1	0.042	0.18	50
Diethyl phthalate	84-66-2	10000(c)	10000(c)	50
2,4-Dimethyl phenol	105-67-9	1100	10000(c)	10
Dimethyl phthalate	131-11-3	10000(c)	10000(c)	50
2,4-Dinitrophenol	51-28-5	110	2100	10
Dinitrotoluene (2,4-/2,6- mixture)	25321-14-6	1(l)	4(l)	10(l)
Endosulfan	115-29-7	[3] 340(g)	[52] 6200(g)	50
Endrin	72-20-8	17	310	50
Ethylbenzene	100-41-4	1000(d)	1000(d)	100
Fluoranthene	206-44-0	2300	10000(c)	[500] 100(i)
Fluorene	86-73-7	2300	10000(c)	100
Heptachlor	76-44-8	0.15	0.65	[500] 50(j)
Hexachlorobenzene	118-74-1	0.66(f)	2	[50] 100(i)
Hexachlorobutadiene	87-68-3	[11] 1(g)	[210] 21(g)	[50] 100(g)

Soil Cleanup Criteria (mg/kg)
(Last Revised - 2/3/94)

Hexachlorocyclopentadiene	77-47-4	400	7300	100	
Hexachloroethane	67-72-1	6	100	100	
Indeno(1,2,3-cd)pyrene	193-39-5	0.9	4	500	
Isophorone	78-59-1	1100	10000(c)	[10]	50(j)
Lead	7439-92-1	~~100~~(p) 400 *	600(q)	(h)	
Lindane	58-89-9	0.52	2.2	[1]	50(j)
2-Methylphenol	95-48-7	2800	10000(c)	(r)	
4-Methylphenol	106-44-5	2800	10000(c)	(r)	
Methoxychlor	72-43-5	280	5200	[500]	50(i)
Mercury	7439-97-6	14	270	(h)	
4-Methyl-2-pentanone(MIBK)	108-10-1	1000(d)	1000(d)	50	
Methylene chloride	75-09-2	49	210	[10]	1(j)
Naphthalene	91-20-3	230	4200	100	
Nickel	7440-02-0	250	2400(k)(n)	(h)	
Nitrobenzene	98-95-3	28	520	[50]	10(i)
N-Nitrosodiphenylamine	86-30-6	140	600	100	
N-Nitrosodi-n-propylamine	621-64-7	0.66(f)	0.66(f)	[1]	10(j)
PCBs (Polychlorinated biphenyls)	1336-36-3	0.49	2	[100]	50(i)
Pentachlorophenol	87-86-5	6	24	100	
Phenol	103-95-2	10000(c)	10000(c)	50	
Pyrene	129-00-0	1700	10000(c)	[500]	100(j)
Selenium	7782-49-2	63	3100(n)	(h)	
Silver	7440-22-4	110	4100(n)	(h)	
Styrene	100-42-5	23	97	100	
1,1,1,2-Tetrachloroethane	630-20-6	170	310	1	
1,1,2,2-Tetrachloroethane	79-34-5	34	70(k)	1	
Tetrachloroethylene	127-18-4	4(k)	6(k)	1	
Thallium	7440-28-0	2(f)	2(f)	(h)	
Toluene	108-88-3	1000(d)	1000(d)	500	
Toxaphene	8001-35-2	0.10(k)	0.2(k)	[100]	50(i)
1,2,4-Trichlorobenzene	120-82-1	68	1200	100	
1,1,1-Trichloroethane	71-53-6	210	1000(d)	50	
1,1,2-Trichloroethane	79-00-5	22	420	1	
Trichloroethene (TCE)	79-01-6	23	54(k)	1	
2,4,5-Trichlorophenol	95-95-4	5600	10000(c)	50	
2,4,6-Trichlorophenol	88-06-2	62	270	[50]	10(i)
Vanadium	7440-62-2	370	7100(n)	(h)	
Vinyl chloride	75-01-4	2	7	[1]	10(i)
Xylenes (Total)	1330-29-7	410	1000(d)	10	
Zinc	7440-66-6	1500(m)	1500(m)	(h)	

* 1995 change.

Soil Cleanup Criteria (mg/kg)
(Last Revised - 2/3/94)

Footnotes

(a) criteria are health based using an incidental ingestion exposure pathway except where noted below
(b) criteria are subject to change based on site specific factors (e.g., aquifer classification, soil type, natural background, environmental impacts, etc.)
(c) health based criterion exceeds the 10000 mg/kg maximum for total organic contaminants
(d) health based criterion exceeds the 1000 mg/kg maximum for total volatile organic contaminants
(e) cleanup standard proposal was based on natural background
(f) health based criterion is lower than analytical limits; cleanup criterion based on practical quantitation level
(g) criterion has been recalculated based on new toxicological data
(h) the impact to ground water values for inorganics will be developed based upon site specific chemical and physical parameters
(i) original criterion was incorrectly calculated and has been recalculated
(j) typographical error
(k) criterion based on inhalation exposure pathway which yielded a more stringent criterion than the incidental ingestion exposure pathway
(l) new criterion derived using methodology in the basis and background document
(m) criterion based on ecological (phytotoxicity) effects
(n) level of the human health based criterion is such that evaluation for potential environmental impacts on a site by site basis is recommended
(o) level of the criterion is such that evaluation for potential acute exposure hazard is recommended
(p) criterion based on the goal that children should be exposed to the minimal amount of lead that is practicable and is reflective of natural background as altered by diffuse anthropogenic pollution. Criterion corresponds to both a median value for urban land which has not been impacted by any local point source of lead and a 90th percentile value for similar suburban land
(q) criteria was derived from a model developed by the Society for Environmental Geochemistry and Health (SEGH) and was designed to be protective for adults in the workplace
(r) Insufficient information available to calculate impact to ground water criteria

SOIL CLEANUP CRITERIA (mg/kg)
(Last Revised - 3/8/93)

This listing represents the combination of Tables 3-1 and 7-1 from the Department of Environmental Protection and Energy's February 3, 1992 proposed rule entitled Cleanup Standards for Contaminated Sites, N.J.A.C. 7:26D, with noted corrections based upon errors identified to the Department during the comment period as well as new toxicological information obtained since the rule proposal. Please refer to the respective footnotes for more detail. Notwithstanding, where the following criteria are based on human health impacts, the Department shall still consider environmental impacts when establishing site specific cleanup criteria. This along with other site specific factors including background conditions may result in site specific cleanup criteria which differ from the criteria listed below. Therefore, this list shall not be assumed to represent approval by the Department of any remedial action or to represent the Department's opinion that a site requires remediation.

Note: Material bracketed [thus] is deleted and material underlined thus is added

Contaminant	CASRN	Residential Direct Contact Soil Cleanup Criteria(a)(b)	Non Residential Direct Contact Soil Cleanup Criteria(a)(b)	Impact to Ground water Soil Cleanup Criteria(b)
Acenaphthene	83-32-9	3400	10000(c)	100
Acetone	67-64-1	1000(d)	1000(d)	50
Acrylonitrile	107-13-1	1	5	100
Aldrin	309-00-2	0.040	0.17	50
Anthracene	120-12-7	10000(c)	10000(c)	500
Antimony	7440-36-0	14	340	
Arsenic [(Total)]	7440-38-2	[20](e) 2(f)	[20](e) 2(f)	
Barium	7440-39-3	[600] 700(g)	[26000] 47000(g)(e)	
Benzene	71-43-2	3	13	1
3,4-Benzofluoranthene (Benzo(b)fluoranthene)	205-99-2	[0.66] 0.9(g)	[2.5] 4(g)	500
Benzo(a)anthracene	56-55-3	[0.66] 0.9(g)	[2.5] 4(g)	500
Benzo(a)pyrene (BaP)	50-32-8	0.66(f)	0.66(f)	100
Benzo(k)fluoranthene	207-08-9	[0.66] 0.9(g)	[2.5] 4(g)	500
[Benzo(ghi)perylene]	[191-24-2]	[0.66](h)	[2.5](h)	500
Benzyl Alcohol	100-51-6	10000(c)	10000(c)	50
Beryllium	7440-41-7	[2](e) 1(f)	[2](e) 1(f)	
Bis(2-chloroethyl) ether	111-44-4	[1] 0.66(f)(i)	3	1
Bis(2-chloroisopropyl) ether	39638-32-9	2300	10000(c)	10
Bis(2-ethylhexyl) phthalate	117-81-7	49	210	100
Bromodichloromethane (Dichlorobromomethane)	75-27-4	5	22	1
Bromoform	75-25-2	86	370	1

Bromomethane	74-83-9	[790] 79(i)	1000(d)	1
2-Butanone (MEK)	78-93-3	1000(d)	1000(d)	50
Butylbenzyl phthalate[s](j)	85-68-7	[10000](j) 1100	10000(c)	100
Cadmium	7440-43-9	1	100	
Carbon tetrachloride	56-23-5	2(k)	4(k)	1
4-Chloroaniline	106-47-8	230(i)	4200(i)	
Chlorobenzene	108-90-7	37	[690] 680(i)	1
Chloroform	67-66-3	19(k)	28(k)	1
4-Chloro-3-methyl phenol (p-Chloro-m-cresol)	59-50-7	10000(c)	10000(c)	100
Chloromethane	74-87-3	520	1000(d)	10
2-Chlorophenol	95-57-8	280	5200	50
Chrysene	218-01-9	[0.66] 2(g)	[2.5] 40(g)	500
Copper	7440-50-8	600(m)	600(m)	
Cyanide	57-12-5	[280] 1100(g)	[5200] 21000(g)(t)	
4,4'-DDD (p,p'-TDE)	72-54-8	3	12	100
4,4'-DDE	72-55-9	2	9	100
4,4'-DDT	50-29-3	2	9	100
Dibenz(a,h)anthracene	53-70-3	0.66(f)	0.66(f)	500
Dibromochloromethane (Chlorodibromomethane)	124-48-1	110	1000(d)	1
Di-n-butyl phthalate	84-74-2	5700	10000(c)	100
Di-n-octyl phthalate	117-84-0	1100	10000(c)	100
1,2-Dichlorobenzene	95-50-1	5100	10000(c)	50
1,3-Dichlorobenzene	541-73-1	5100	10000(c)	100
1,4-Dichlorobenzene	106-46-7	[280](j) 570	[1200](j) 10000(c)	100
3,3'-Dichlorobenzidine	91-94-1	2	[7] 6(i)	100
1,1-Dichloroethane	75-34-3	[1000] 570(i)	1000(d)	1
1,2-Dichloroethane	107-06-2	6	24	1
1,1-Dichloroethene	75-35-4	[51](j) 8	[940](j) 150	10
1,2-Dichloroethene (trans)	156-60-5	[960] 1000(d)(i)	[10000](j) 1000(d)	50
1,2-Dichloroethene (cis)	156-59-2	79	[1500](n) 1000(d)	50
2,4-Dichlorophenol	120-83-2	170	[5200](j) 3100	10
1,2-Dichloropropane	78-87-5	10(i)	43(i)	
1,3-Dichloropropene (cis and trans)	542-75-6	4	5(k)	1
Dieldrin	60-57-1	0.042	0.18	50
Diethyl phthalate	84-66-2	10000(c)	10000(c)	50
2,4-Dimethyl phenol	105-67-9	1100	10000(c)	10
Dimethyl phthalate	131-11-3	10000(c)	10000(c)	50
2,4-Dinitrophenol	51-28-5	110	2100	10
[2,4-Dinitrotoluene]	[121-14-2]	[1](o)	[4](o)	10
Endosulfan	115-29-7	3	52	50
Endrin	72-20-8	17	310	50
Ethylbenzene	100-41-4	1000(d)	1000(d)	100
Fluoranthene	206-44-0	2300	10000(c)	500

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Fluorene	86-73-7	2300	10000(c)	100
[Fluoride]	[16984-48-8]	[1100](p)	[10000](p)	
Heptachlor	76-44-8	0.15	0.65	500
Hexachlorobenzene	118-74-1	[0.42](n) 0.66(f)	2	50
Hexachlorobutadiene	87-68-3	11	210	50
Hexachlorocyclopentadiene	77-47-4	400	7300	100
Hexachloroethane	67-72-1	[1700](j) 6	[10000](j) 100	100
Indeno(1,2,3-cd)pyrene	193-39-5	[0.66] 0.9(g)	[2.5] 4(g)	500
Isophorone	78-59-1	1100	10000(c)	10
Lead [(Total)]	7439-92-1	~~100~~(u) 4.0	600(v)	
Lindane	58-89-9	0.52	2.2	1
2-Methylphenol	95-48-7	2800(l)(i)	10000(l)(c)	
4-Methylphenol	106-44-5	2800(l)(i)	10000(l)(c)	
Methoxychlor	72-43-5	280	5200	500
Mercury [(Total)]	7439-97-6	14	[260] 270(i)	
4-Methyl-2-pentanone(MIBK)	108-10-1	1000(d)	1000(d)	50
Methylene chloride	75-09-2	49	[170] 210(i)	10
[Napthalene](j) Naphthalene	91-20-3	230	4200	100
Nickel [(Soluble salts)]	7440-02-0	250	2400(k)	
Nitrobenzene	98-95-3	[1] 28(q)	520	50
N-Nitrosodiphenylamine	86-30-6	140	[590] 600(i)	100
N-Nitrosodi-n-propylamine	621-64-7	0.66(f)	0.66(f)	1
PCBs (Polychlorinated biphenyls)	1336-36-3	[0.45](i) 0.49	2	100
Pentachlorophenol	87-86-5	[1700](j) 6	[10000](j) 24	100
Phenol	103-95-2	10000(c)	10000(c)	50
Pyrene	129-00-0	1700	10000(c)	500
Selenium [(Total)]	7782-49-2	[1] 63(g)	[1000] 3100(g)(s)	
Silver	7440-22-4	[40] 110(g)	[2000] 4100(g)(s)	
Styrene	100-42-5	23	97	100
1,1,1,2-Tetrachloroethane	630-20-6	[260] 170(g)	[440] 310(g)	1
1,1,2,2-Tetrachloroethane	79-34-5	34	70(k)	1
Tetrachloroethylene	127-18-4	[9] 4(r)	[37] 6(r)	1
Thallium	7440-28-0	2(f)	2(f)	
Toluene	108-88-3	1000(d)	1000(d)	500
Toxaphene	8001-35-2	[0.62] 0.10(r)	[2.7] 0.2(r)	100
1,2,4-Trichlorobenzene	120-82-1	[1100] 68(g)	[10000] 1200(g)	100
1,1,1-Trichloroethane	71-53-6	210	[3800](n) 1000(d)	50
1,1,2-Trichloroethane	79-00-5	[23] 22(i)	420	1
Trichloroethene (TCE)	79-01-6	23	[100] 54(r)	1
2,4,5-Trichlorophenol	95-95-4	5600	10000(c)	50
2,4,6-Trichlorophenol	88-06-2	62	[260] 270(i)	50
Vanadium	7440-62-2	[380] 370(i)	[7000] 7100(i)(s)	
Vinyl chloride	75-01-4	2	7	1

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Xylenes (Total)	1330-29-7	[360] 410(i)	[6300](n) 1000(d)	10
Zinc	7440-66-6	1500(m)	1500(m)	

(a) criteria are health based using an incidental ingestion exposure pathway except where noted below
(b) criteria are subject to change based on site specific factors (e.g., aquifer classification, soil type, natural background, environmental impacts, etc.)
(c) health based criterion exceeds the 10000 mg/kg maximum for total organic contaminants
(d) health based criterion exceeds the 1000 mg/kg maximum for total volatile organic contaminants
(e) cleanup standard proposal was based on natural background
(f) health based criterion is lower than analytical limits; cleanup criterion based on practical quantitation level
(g) criterion has been recalculated based on new toxicological data
(h) proposed standard is withdrawn as there is no published slope factor or RfD for this compound
(i) original criterion was incorrectly calculated; new criterion recalculated using original toxicological data
(j) typographical error
(k) criterion based on inhalation exposure pathway which yielded a more stringent criterion than the incidental ingestion exposure pathway
(l) criterion derived in the basis and background document but inadvertently omitted from Table 3-1 for the residential standard and Table 7-1 for the non-residential standard as found in the proposed rule
(m) criterion based on ecological (phytotoxicity) effects
(n) health based criterion
(o) proposed standard is withdrawn as there is no current published carcinogenic classification or slope factor
(p) proposed standard is withdrawn pending further evaluation
(q) proposed standard was based on inhalation exposure pathway using incorrect toxicological information. Recalculation using the correct toxicological information renders incidental ingestion as the more stringent exposure pathway.
(r) criterion based on incidental ingestion exposure pathway was inadvertently proposed in lieu of criterion based on inhalation exposure pathway which yielded a more stringent criterion
(s) level of the human health based criterion is such that evaluation for potential environmental impacts on a site by site basis is recommended
(t) level of the criterion is such that evaluation for potential acute exposure hazard is recommended
(u) criteria based on the goal that children should be exposed to the minimal amount of lead that is practicable and is reflective of natural background as altered by diffuse anthropogenic pollution. Criterion corresponds to both a median value for urban land which has not been impacted by any local point source of lead and a 90th percentile value for similar suburban land.
(v) criteria was derived from a model developed by the Society for Environmental Geochemistry and Health (SEGH) and was designed to be protective for adults in the workplace

APPENDIX A-2

EPA's MAXIMUM CONCENTRATION OR CONTAMINANTS FOR THE TOXICITY CHARACTERISTIC

Maximum Concentration of Contaminants for the Toxicity Characteristic

EPA HW NUMBER[1]	CONTAMINANT	REGULATORY LEVEL (mg/L)	ANALYTE CATEGORY
D004	Arsenic	5.0	Metal
D005	Barium	100.0	Metal
D018	Benzene	0.5	Volatile
D006	Cadmium	1.0	Metal
D019	Carbon tetrachloride	0.5	Volatile
D020	Chlordane	0.03	Pesticide
D021	Chlorobenzene	100.0	Volatile
D022	Chloroform	6.0	Volatile
D007	Chromium	5.0	Metal
D023	o-Cresol	200.0	Acid Extractable
D024	m-Cresol	200.0	Acid Extractable
D025	p-Cresol	200.0	Acid Extractable
D026	Cresol	200.0	Acid Extractable
D016	2, 4-D	10.0	Herbicide
D027	1, 4-Dichlorobenzene	7.5	Base Neutral
D028	1, 2-Dichloroethane	0.5	Volatile
D029	1,1-Dichloroethylene	0.7	Volatile
D030	2, 4-Dinitrotoluene	0.13	Base Neutral
D012	Endrin	0.02	Pesticide
D031	Heptachlor (and its epoxide)	0.008	Pesticide
D032	Hexachlorobenzene	0.13	Base Neutral
D033	Hexachlorobutadiene	0.5	Base Neutral
D034	Hexachloroethane	3.0	Base Neutral
D008	Lead	5.0	Metal
D013	Lindane	0.4	Pesticide
D009	Mercury	0.2	Metal
D014	Methoxychlor	10.0	Pesticide
D035	Methyl ethyl ketone	200.0	Volatile
D036	Nitrobenzene	2.0	Base Neutral
D037	Pentachlorophenol	100.0	Acid Extractable
D038	Pyridine	5.0	Base Neutral
D010	Selenium	1.0	Metal
D011	Silver	5.0	Metal
D039	Tetrachoroethylene	0.7	Volatile
D015	Toxaphene	.5	Pesticide
D040	Trichloroethylene	.5	Volatile
D041	2,4, 5-Trichlorophenol	400.0	Acid Extractable
D042	2,4, 6-Trichlorophenol	2.0	Acid Extractable
D017	2,4 ,5-TP (Silvex)	1.0	Herbicide
D043	Vinyl chloride	.2	Volatile

[1]Hazardous Waste Number

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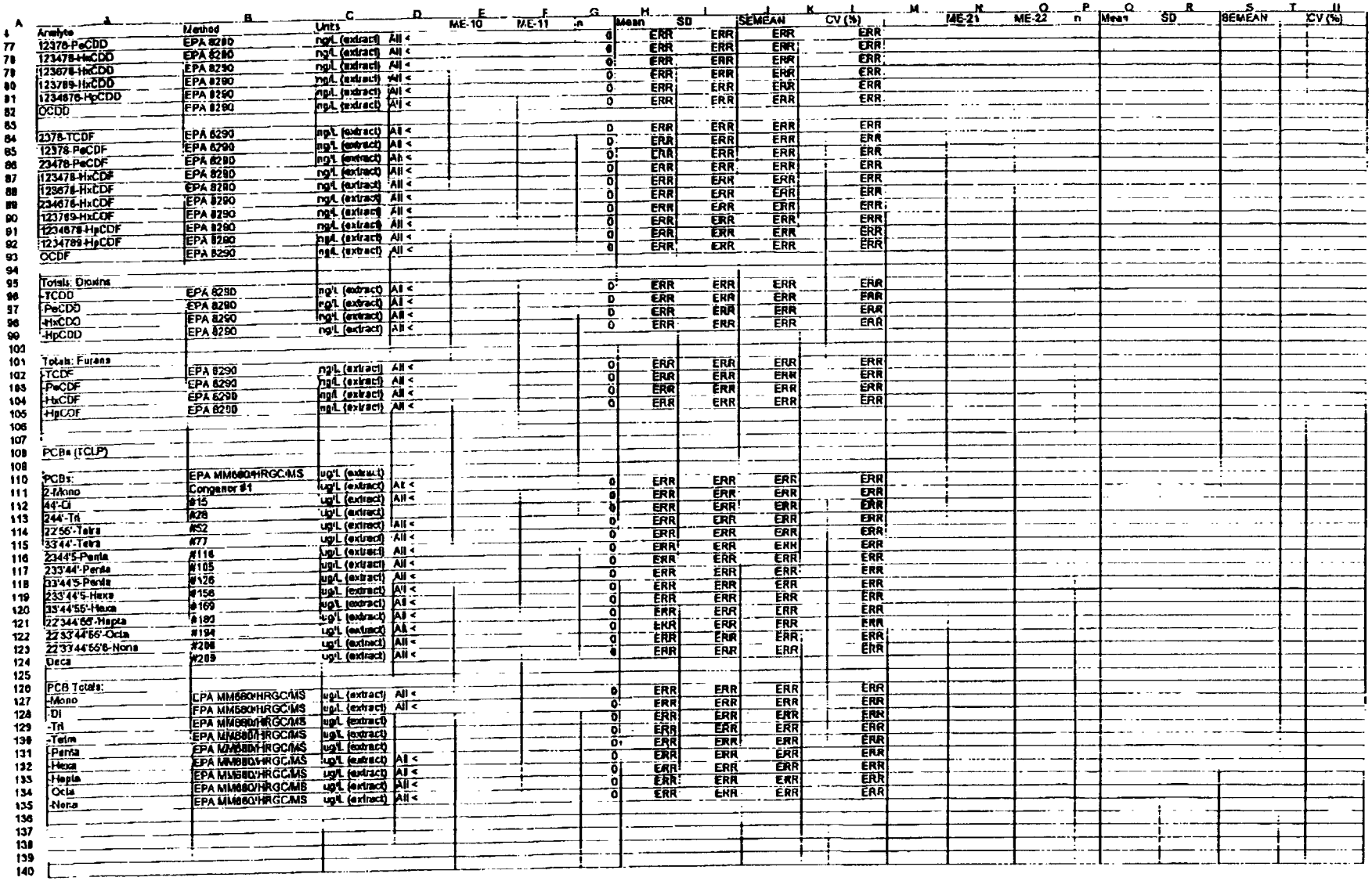
APPENDIX A-3

BNL ANALYTICAL RESULTS TO M&E

Analyte	Method	Units		ME-10	ME-11	n	Mean	SD	SEMEAN	CV (%)	ME-21	ME-22	n	Mean	SD	SEMEAN	CV (%)
Analytical Results for Metcalf & Eddy: GRS Solidsea Eas		Products		Solidified >	ORG-X												
											Direct SOLRIX of Sediments						
Analyte	Method	Units		ME-10	ME-11	n	Mean	SD	SEMEAN	CV (%)	ME-21	ME-22	n	Mean	SD	SEMEAN	CV (%)
Metals (TCLP)													0	ERR	ERR	ERR	ERR
Arsenic	EPA 1311/3010/6010A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00			0	ERR	ERR	ERR	ERR
Barium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.5	0.5	2	0.50000	0.00000	0.00000	0.00							
Cadmium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000	0.00							
Chromium	EPA 1311/3010/6010A	mg/L (extract)		0.02	0.01	2	0.01500	0.00500	0.00500	33.33							
Lead	EPA 1311/3010/6010A	mg/L (extract)	All <	0.05	0.05	2	0.05000	0.00000	0.00000	0.00							
Mercury	EPA 1311/7470	mg/L (extract)	All <	0.001	0.001	2	0.00100	0.00000	0.00000	0.00							
Selenium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
Silver	EPA 1311/3010/6010A	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000	0.00							
Organo-Cl Pesticides (TCLP)																	
Chlordane	EPA 1311/8080	mg/L (extract)	All <	0.005	0.005	2	0.00500	0.00000	0.00000	0.00							
Endrin	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000	0.00							
Heptachlor	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000	0.00							
Heptachlor epoxide	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000	0.00							
Lindane (g-BHC)	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000	0.00							
Methoxychlor	EPA 1311/8080	mg/L (extract)	All <	0.001	0.001	2	0.00100	0.00000	0.00000	0.00							
Toxaphene	EPA 1311/8080	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000	0.00							
Cl Herbicides (TCLP)																	
2,4-D	EPA 1311/8150A (Mod)	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
2,4,5-TP (Silvex)	EPA 1311/8150A (Mod)	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000	0.00							
Volatile Organics (TCLP)																	
Benzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
Carbon tetrachloride	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
Chlorobenzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
Chloroform	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
1,4-Dichlorobenzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
1,2-Dichloroethane	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
1,1-Dichloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
Methyl ethyl ketone	EPA 1311/8240A	mg/L (extract)	All <	5	5	2	5.00000	0.00000	0.00000	0.00							
Tetrachloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
Trichloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000	0.00							
Vinyl chloride	EPA 1311/8740A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
Semi-Volatiles (TCLP)																	
Hexachloroethane	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
Nitrobenzene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
Hexachlorobutadiene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
2,4-Dinitrotoluene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
Hexachlorobenzene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
2,4,6-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
2,4,5-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.25	0.25	2	0.25000	0.00000	0.00000	0.00							
Pentachlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.25	0.25	2	0.25000	0.00000	0.00000	0.00							
Pyridine	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
o-Cresol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
m,p-Cresols	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000	0.00							
Total Cresols	EPA 1311/8270A	mg/L (extract)	All <														
PAHs (TCLP)																	
Naphthalene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.05	0.05	2	0.05000	0.00000	0.00000	0.00							
2-Methylnaphthalene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.05	0.05	2	0.05000	0.00000	0.00000	0.00							
Acenaphthylene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.03	0.03	2	0.03000	0.00000	0.00000	0.00							
Acenaphthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.03	0.03	2	0.03000	0.00000	0.00000	0.00							
Dibenzofuran	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.02	0.02	2	0.02000	0.00000	0.00000	0.00							
Fluorene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.02	0.02	2	0.02000	0.00000	0.00000	0.00							
Phenanthrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.02	0.02	2	0.02000	0.00000	0.00000	0.00							
Anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.03	0.03	2	0.03000	0.00000	0.00000	0.00							
Fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.02	0.02	2	0.02000	0.00000	0.00000	0.00							
Pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.03	0.03	2	0.03000	0.00000	0.00000	0.00							
Benzo(a)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	1	1	2	1.00000	0.00000	0.00000	0.00							
Chrysene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	1	1	2	1.00000	0.00000	0.00000	0.00							
Benzo(b)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	1	1	2	1.00000	0.00000	0.00000	0.00							
Benzo(k)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	1	1	2	1.00000	0.00000	0.00000	0.00							
Benzo(a)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	1	1	2	1.00000	0.00000	0.00000	0.00							
Indeno(123-cd)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	1	1	2	1.00000	0.00000	0.00000	0.00							
Dibenz(a,h)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	1	1	2	1.00000	0.00000	0.00000	0.00							
Benzo(ghi)perylene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	1	1	2	1.00000	0.00000	0.00000	0.00							
Dioxins/Furans																	
2378-TCDD	EPA 8290	mg/L (extract)	All <			0	ERR	ERR	ERR	ERR							



Analyte	Method	Units		ME-10	ME-11	n	Mean	SD	SEMEAN	CV (%)	ME-21	ME-22	n	Mean	SD	SEMEAN	CV (%)
12378-PeCDD	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
123478-HxCDD	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
123678-HxCDD	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
123789-HxCDD	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
1234678-HpCDD	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
OCDD	EPA 8290	ng/L (extract)	All <														
2378-TCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
12378-PeCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
23478-PeCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
123478-HxCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
123678-HxCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
234678-HxCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
123789-HxCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
1234678-HpCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
1234789-HpCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
OCDF	EPA 8290	ng/L (extract)	All <														
Totals: Dioxins						0	ERR	ERR	ERR	ERR							
-TCDD	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-PeCDD	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-HxCDD	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-HpCDD	EPA 8290	ng/L (extract)	All <														
Totals: Furans						0	ERR	ERR	ERR	ERR							
-TCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-PeCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-HxCDF	EPA 8290	ng/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-HpCDF	EPA 8290	ng/L (extract)	All <														
PCBs (TCLP)																	
PCBs:	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR	ERR							
2-Mono	Congener #1	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
44'-Di	#15	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
244'-Tri	#28	ug/L (extract)				0	ERR	ERR	ERR	ERR							
22'55'-Tetra	#52	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
33'44'-Tetra	#77	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
23'44'5-Penta	#118	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
233'44'-Penta	#105	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
33'44'5-Penta	#126	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
233'44'5-Hexa	#156	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
33'44'55'-Hexa	#169	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
22'344'66'-Hepta	#180	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
22'33'44'66'-Octa	#194	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
22'33'44'55'6-Nona	#206	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
Deca	#209	ug/L (extract)	All <														
PCB Totals:						0	ERR	ERR	ERR	ERR							
-Mono	EPA MM680/HRGC/MS	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-Di	EPA MM680/HRGC/MS	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-Tri	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR	ERR							
-Tetra	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR	ERR							
-Penta	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR	ERR							
-Hexa	EPA MM680/HRGC/MS	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-Hepta	EPA MM680/HRGC/MS	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
Octa	EPA MM680/HRGC/MS	ug/L (extract)	All <			0	ERR	ERR	ERR	ERR							
-Nona	EPA MM680/HRGC/MS	ug/L (extract)	All <														

	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
1	Analytical Results for Metcalf	& Eddy/GRS End Product										
2	(Air-dried solids after solvent	extraction)										
3												
4	Gross Physico-Chemical Properties											
5												
6												
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
8												
9	Particle size	ASTM D422 (Mod)	% wt (dry)									
10	Medium gravel > 4.75 mm	ASTM D422 (Mod)	% wt (dry)		0	0	2	0	0	0		ERR
11	Fine grave 2-4.75	ASTM D422 (Mod)	% wt (dry)		0.22	1.80	2	1.01	0.79	0.79		78.22
12	V. coarse sand 0.85-2	ASTM D422 (Mod)	% wt (dry)		2.07	11.80	2	6.935	4.865	4.865		70.15
13	Coarse sand 0.425-0.85	ASTM D422 (Mod)	% wt (dry)		26.6	14.10	2	20.35	6.25	6.25		30.71
14	Medium sand 0.24-0.425	ASTM D422 (Mod)	% wt (dry)		13.6	11.40	2	12.5	1.1	1.1		8.80
15	Fine sand 0 106-0.24	ASTM D422 (Mod)	% wt (dry)		15.1	13.70	2	14.4	0.7	0.7		4.86
16	V. fine sand 0.075-0.106	ASTM D422 (Mod)	% wt (dry)		4.2	4.10	2	4.15	0.05	0.05		1.20
17	Clay	ASTM D422 (Mod)	% wt (dry)		10.8	16.00	2	13.4	2.6	2.6		19.40
18	Silt	ASTM D422 (Mod)	% wt (dry)		26.5	29.20	2	27.85	1.35	1.35		4.85
19												
20												
21	pH	EPA 9045A	pH units		7.1	6.82	2	6.96	0.14	0.14		2.01
22												
23	Solids (total)	EPA 160.3	% wt (dry)		97.4	97.30	2	97.35	0.05	0.05		0.05
24												
25	Sulfides (total)	EPA 9030M	mg/kg (dry)		140	120.00	2	130	10	10		7.69
26												
27	Organic carbon (total)	ASTM D4129-82M	% wt (dry)		6.13	6.06	2	6.095	0.035	0.035		0.57
28												
29												
30												
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	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
49	Polychlorinated Biphenyls											
50												
51	PCBs:	EPA MM680/HRGC/MS	ug/kg (dry)									
52	2-Mono	Congenor #1	ug/kg (dry)		4.00	3.70	2.00	3.85	0.15	0.15		3.90
53	44'-Di	#15	ug/kg (dry)		28.60	29.00	2.00	28.80	0.20	0.20		0.69
54	244'-Tri	#28	ug/kg (dry)	Reject	15.50	22.90	2.00	19.20	3.70	3.70		19.27
55	22'55'-Tetra	#52	ug/kg (dry)		22.50	20.20	2.00	21.35	1.15	1.15		5.39
56	33'44'-Tetra	#77	ug/kg (dry)		4.20	4.40	2.00	4.30	0.10	0.10		2.33
57	2344'5-Penta	#118	ug/kg (dry)	Reject	4.70	2.30	2.00	3.50	1.20	1.20		34.29
58	233'44'-Penta	#105	ug/kg (dry)		9.00	9.30	2.00	9.15	0.15	0.15		1.64
59	33'44'5-Penta	#126	ug/kg (dry)		0.27	0.26	2.00	0.27	0.01	0.01		1.89
60	233'44'5-Hexa	#158	ug/kg (dry)		1.60	1.60	2.00	1.60	0.00	0.00		0.00
61	33'44'55'-Hexa	#169	ug/kg (dry)	All <	0.03	0.03	2.00	0.03	0.00	0.00		0.00
62	22'344'55'-Hepta	#180	ug/kg (dry)		9.30	9.40	2.00	9.35	0.05	0.05		0.53
63	22'33'44'55'-Octa	#194	ug/kg (dry)		1.90	2.00	2.00	1.95	0.05	0.05		2.56
64	22'33'44'55'6-Nona	#206	ug/kg (dry)		1.60	1.70	2.00	1.65	0.05	0.05		3.03
65	Deca	#209	ug/kg (dry)		1.40	1.40	2.00	1.40	0.00	0.00		0.00
66												
67	PCB Totals:											
68	-Mono	EPA MM680/HRGC/MS	ug/kg (dry)		16.80	16.40	2.00	16.60	0.20	0.20		1.20
69	-Di	EPA MM680/HRGC/MS	ug/kg (dry)		76.20	79.10	2.00	77.65	1.45	1.45		1.87
70	-Tri	EPA MM680/HRGC/MS	ug/kg (dry)		104.00	111.00	2.00	107.50	3.50	3.50		3.26
71	-Tetra	EPA MM680/HRGC/MS	ug/kg (dry)		144.00	160.00	2.00	152.00	8.00	8.00		5.26
72	-Penta	EPA MM680/HRGC/MS	ug/kg (dry)		104.00	114.00	2.00	109.00	5.00	5.00		4.59
73	-Hexa	EPA MM680/HRGC/MS	ug/kg (dry)		60.50	64.80	2.00	62.65	2.15	2.15		3.43
74	-Hepta	EPA MM680/HRGC/MS	ug/kg (dry)		35.50	35.30	2.00	35.40	0.10	0.10		0.28
75	-Octa	EPA MM680/HRGC/MS	ug/kg (dry)		8.60	9.10	2.00	8.85	0.25	0.25		2.82
76	-Nona	EPA MM680/HRGC/MS	ug/kg (dry)		2.20	2.60	2.00	2.40	0.20	0.20		8.33
77												
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	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
97												
98	Chlorinated Pesticides and Herbicides											
99												
100												
101	Pesticides (Cl):											
102	a-BHC	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
103	a-Chlordane	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
104	Aldrin	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
105	beta-BHC	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
106	delta-BHC	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
107	4,4'-DDD	EPA 8080	ug/kg (dry)		3.53	14.82	2	9.18	5.65	5.65		61.53
108	4,4'-DDE	EPA 8080	ug/kg (dry)	All <	3.53	3.55	2	3.54	0.01	0.01		0.28
109	4,4'-DDT	EPA 8080	ug/kg (dry)	All <	3.53	3.55	2	3.54	0.01	0.01		0.28
110	Dieldrin	EPA 8080	ug/kg (dry)	All <	3.53	3.55	2	3.54	0.01	0.01		0.28
111	Endrin	EPA 8080	ug/kg (dry)	All <	3.53	3.55	2	3.54	0.01	0.01		0.28
112	Endrin aldehyde	EPA 8080	ug/kg (dry)	All <	3.53	3.55	2	3.54	0.01	0.01		0.28
113	Endosulfan I	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
114	Endosulfan II	EPA 8080	ug/kg (dry)	All <	3.53	3.55	2	3.54	0.01	0.01		0.28
115	Endosulfan sulfate	EPA 8080	ug/kg (dry)	All <	3.53	3.55	2	3.54	0.01	0.01		0.28
116	g-BHC (Lindane)	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
117	g-Chlordane	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
118	Heptachlor	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
119	Heptachlor epoxide	EPA 8080	ug/kg (dry)	All <	1.77	1.77	2	1.77	0.00	0.00		0.00
120	Methoxychlor	EPA 8080	ug/kg (dry)	All <	17.66	17.74	2	17.70	0.04	0.04		0.23
121	Toxaphene	EPA 8080	ug/kg (dry)	All <	176.59	177.38	2	176.99	0.40	0.40		0.22
122												
123												
124	Chlorinated Herbicides											
125	2,4-D	EPA 8150A (Mod)	mg/kg (dry)	All <	0.2	0.2	2	0.20	0.00	0.00		0.00
126	2,4,5-TP (Silvex)	EPA 8150A (Mod)	mg/kg (dry)	All <	0.05	0.05	2	0.05	0.00	0.00		0.00
127	2,4,5-T	EPA 8150A (Mod)	mg/kg (dry)	All <	0.05	0.05	2	0.05	0.00	0.00		0.00
128												
129												
130												
131												
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133												
134												
135												
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140												
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142												
143												
144												

A	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
145												
146	Semivolatile Compounds (inc											
147	Phenol	EPA 8270A	ug/kg (dry)		151.1	201.8	2	176.45	25.36	25.35		14.37
148	bis(2-Chloroethyl)ether	EPA 8270A	ug/kg (dry)	All <	128.0	144.0	2	136.00	8.00	8.00		5.88
149	2-Chlorophenol	EPA 8270A	ug/kg (dry)	All <	138.0	155.0	2	146.50	8.50	8.50		5.80
150	1,3-Dichlorobenzene	EPA 8270A	ug/kg (dry)	All <	132.0	149.0	2	140.50	8.50	8.50		6.05
151	1,4-Dichlorobenzene	EPA 8270A	ug/kg (dry)		56.4	56.9	2	56.65	0.25	0.25		0.44
152	1,2-Dichlorobenzene	EPA 8270A	ug/kg (dry)		48.1	68.7	2	58.40	10.30	10.30		17.64
153	Benzyl alcohol	EPA 8270A	ug/kg (dry)	All <	321.0	361.0	2	341.00	20.00	20.00		5.87
154	2,2'-oxybis(1-Chloropropane)	EPA 8270A	ug/kg (dry)	All <	112.0	126.0	2	119.00	7.00	7.00		5.88
155	2-Methylphenol	EPA 8270A	ug/kg (dry)	All <	139.0	157.0	2	148.00	9.00	9.00		6.08
156	3/4-Methylphenol	EPA 8270A	ug/kg (dry)		245.0	262.0	2	253.50	8.50	8.50		3.35
157	N-Nitroso-di-n-propylamine	EPA 8270A	ug/kg (dry)	All <	189.0	212.0	2	200.50	11.50	11.50		5.74
158	Hexachloroethane	EPA 8270A	ug/kg (dry)	All <	181.0	203.0	2	192.00	11.00	11.00		5.73
159	Nitrobenzene	EPA 8270A	ug/kg (dry)	All <	98.0	112.0	2	105.00	7.00	7.00		6.67
160	Isophorone	EPA 8270A	ug/kg (dry)	All <	59.0	67.0	2	63.00	4.00	4.00		6.35
161	2-Nitrophenol	EPA 8270A	ug/kg (dry)	All <	247.0	283.0	2	265.00	18.00	18.00		6.79
162	2,4-Dimethylphenol	EPA 8270A	ug/kg (dry)	All <	111.0	127.0	2	119.00	8.00	8.00		6.72
163	bis(2-Chloroethoxy)methane	EPA 8270A	ug/kg (dry)	All <	99.0	113.0	2	106.00	7.00	7.00		6.60
164	Benzoic acid	EPA 8270A	ug/kg (dry)		4214.0	3417.0	2	3815.50	398.50	398.50		10.44
165	2,4-Dichlorophenol	EPA 8270A	ug/kg (dry)	All <	151.0	173.0	2	162.00	11.00	11.00		6.79
166	1,2,4-Trichlorobenzene	EPA 8270A	ug/kg (dry)		222.0	197.0	2	209.50	12.50	12.50		5.97
167	Naphthalene	EPA 8270A	ug/kg (dry)		756.0	753.0	2	754.50	1.50	1.50		0.20
168	4-Chloroaniline	EPA 8270A	ug/kg (dry)	All <	113.0	130.0	2	121.50	8.50	8.50		7.00
169	Hexachlorobutadiene	EPA 8270A	ug/kg (dry)	All <	149.0	170.0	2	159.50	10.50	10.50		6.58
170	4-Chloro-3-methylphenol	EPA 8270A	ug/kg (dry)	All <	120.0	138.0	2	129.00	9.00	9.00		6.98
171	2-Methylnaphthalene	EPA 8270A	ug/kg (dry)		517.0	465.0	2	491.00	26.00	26.00		5.30
172	Hexachlorocyclopentadiene	EPA 8270A	ug/kg (dry)	All <	183.0	208.0	2	195.50	12.50	12.50		6.39
173	2,4,6-Trichlorophenol	EPA 8270A	ug/kg (dry)	All <	203.0	231.0	2	217.00	14.00	14.00		6.45
174	2,4,5-Trichlorophenol	EPA 8270A	ug/kg (dry)	All <	188.0	214.0	2	201.00	13.00	13.00		6.47
175	2-Chloronaphthalene	EPA 8270A	ug/kg (dry)	All <	76.0	86.0	2	81.00	5.00	5.00		6.17
176	2-Nitroaniline	EPA 8270A	ug/kg (dry)	All <	178.0	203.0	2	190.50	12.50	12.50		6.56
177	Dimethylphthalate	EPA 8270A	ug/kg (dry)	All <	62.0	71.0	2	66.50	4.50	4.50		6.77
178	2,6-Dinitrotoluene	EPA 8270A	ug/kg (dry)	All <	276.0	314.0	2	295.00	19.00	19.00		6.44
179	2,4-Dinitrotoluene	EPA 8270A	ug/kg (dry)	All <	206.0	234.0	2	220.00	14.00	14.00		6.36
180	Acenapthylene	EPA 8270A	ug/kg (dry)		123.0	115.0	2	119.00	4.00	4.00		3.36
181	3-Nitroaniline	EPA 8270A	ug/kg (dry)	All <	273.0	310.0	2	291.50	18.50	18.50		6.35
182	Acenaphthene	EPA 8270A	ug/kg (dry)		134.0	77.0	2	105.50	28.50	28.50		27.01
183	2,4-Dinitrophenol	EPA 8270A	ug/kg (dry)	All <	578.0	657.0	2	617.50	39.50	39.50		6.40
184	4-Nitrophenol	EPA 8270A	ug/kg (dry)	All <	274.0	312.0	2	293.00	19.00	19.00		6.48
185	Dibenzofuran	EPA 8270A	ug/kg (dry)		400.0	376.0	2	388.00	12.00	12.00		3.09
186	Diethylphthalate	EPA 8270A	ug/kg (dry)	All <	54.0	152.0	2	103.00	49.00	49.00		47.57
187	4-Chlorophenyl-phenylether	EPA 8270A	ug/kg (dry)	All <	140.0	159.0	2	149.50	9.50	9.50		6.35
188	Fluorene	EPA 8270A	ug/kg (dry)		355.0	319.0	2	337.00	18.00	18.00		5.34
189	4-Nitroaniline	EPA 8270A	ug/kg (dry)	All <	284.0	323.0	2	303.50	19.50	19.50		6.43
190	4,6-Dinitro-2-methylphenol	EPA 8270A	ug/kg (dry)	All <	396.0	534.0	2	465.00	69.00	69.00		14.84
191	N-Nitrosodiphenylamine	EPA 8270A	ug/kg (dry)	All <	124.0	167.0	2	145.50	21.50	21.50		14.78
192	4-Bromophenyl-phenylether	EPA 8270A	ug/kg (dry)	All <	271.0	365.0	2	318.00	47.00	47.00		14.78

	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
193	Hexachlorobenzene	EPA 8270A	ug/kg (dry)	All <	205.0	276.0	2	240.50	35.50	35.50		14.76
194	Pentachlorophenol	EPA 8270A	ug/kg (dry)	All <	298.0	402.0	2	350.00	52.00	52.00		14.86
195	Phenanthrene	EPA 8270A	ug/kg (dry)		2340.0	2358.0	2	2349.00	9.00	9.00		0.38
196	Anthracene	EPA 8270A	ug/kg (dry)		1116.0	1082.0	2	1099.00	17.00	17.00		1.55
197	Di-n-butyl phthalate	EPA 8270A	ug/kg (dry)		264.0	261.0	2	262.50	1.50	1.50		0.57
198	Fluoranthene	EPA 8270A	ug/kg (dry)		2472.0	2526.0	2	2499.00	27.00	27.00		1.08
199	Pyrene	EPA 8270A	ug/kg (dry)		3774.0	3425.0	2	3599.50	174.50	174.50		4.85
200	Butylbenzylphthalate	EPA 8270A	ug/kg (dry)		174.0	122.0	2	148.00	26.00	26.00		17.57
201	3,3'-Dichlorobenzidine	EPA 8270A	ug/kg (dry)	All <	126.0	138.0	2	132.00	6.00	6.00		4.55
202	bis-2-ethylhexylphthalate	EPA 8270A	ug/kg (dry)		5722.0	6042.0	2	5882.00	160.00	160.00		2.72
203	Benzo(a)anthracene	EPA 8270A	ug/kg (dry)		1273.0	1360.0	2	1316.50	43.50	43.50		3.30
204	Chrysene	EPA 8270A	ug/kg (dry)		1972.0	1802.0	2	1887.00	85.00	85.00		4.50
205	Di-n-octylphthalate	EPA 8270A	ug/kg (dry)	All <	85.0	31.0	2	58.00	27.00	27.00		46.55
206	Benzo(b)fluoranthene	EPA 8270A	ug/kg (dry)		1444.0	1651.0	2	1547.50	103.50	103.50		6.69
207	Benzo(k)fluoranthene	EPA 8270A	ug/kg (dry)		570.0	487.0	2	528.50	41.50	41.50		7.85
208	Benzo(a)pyrene	EPA 8270A	ug/kg (dry)		897.0	876.0	2	886.50	10.50	10.50		1.18
209	Indeno(123-cd)pyrene	EPA 8270A	ug/kg (dry)		387.0	378.0	2	382.50	4.50	4.50		1.18
210	Dibenz(a,h)anthracene	EPA 8270A	ug/kg (dry)		189.0		1	189.00	0.00	ERR		0.00
211	Benzo(ghi)perylene	EPA 8270A	ug/kg (dry)		370.0	313.0	2	341.50	28.50	28.50		8.35
212	Benzo(e)pyrene	EPA 8270A	ug/kg (dry)		701.0	767.0	2	734.00	33.00	33.00		4.50
213	Perylene	EPA 8270A	ug/kg (dry)		539.0	450.0	2	494.50	44.50	44.50		9.00
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A	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
241												
242	Dioxins and Furans											
243	2378-TCDD	EPA 8290	ng/kg (dry)		21	19.0	2	20.00	1.00	1.00		5.00
244	12378-PeCDD	EPA 8290	ng/kg (dry)		46	34.3	2	40.15	5.85	5.85		14.57
245	123478-HxCDD	EPA 8290	ng/kg (dry)		52.1	37.4	2	44.75	7.35	7.35		16.42
246	123678-HxCDD	EPA 8290	ng/kg (dry)		79.6	62.6	2	71.10	8.50	8.50		11.95
247	123789-HxCDD	EPA 8290	ng/kg (dry)		123	94.9	2	108.95	14.05	14.05		12.90
248	1234678-HpCDD	EPA 8290	ng/kg (dry)		789	693.0	2	741.00	48.00	48.00		6.48
249	OCDD	EPA 8290	ng/kg (dry)		5880.0	5560.0	2	5720.00	160.00	160.00		2.80
250												
251	2378-TCDF	EPA 8290	ng/kg (dry)		883.0	707.0	2	795.00	88.00	88.00		11.07
252	12378-PeCDF	EPA 8290	ng/kg (dry)		225.0	176.0	2	200.50	24.50	24.50		12.22
253	23478-PeCDF	EPA 8290	ng/kg (dry)		393.0	267.0	2	330.00	63.00	63.00		19.09
254	123478-HxCDF	EPA 8290	ng/kg (dry)		1800.0	1510.0	2	1655.00	145.00	145.00		8.76
255	123678-HxCDF	EPA 8290	ng/kg (dry)		400.0	334.0	2	367.00	33.00	33.00		8.99
256	234678-HxCDF	EPA 8290	ng/kg (dry)		497.0	405.0	2	451.00	46.00	46.00		10.20
257	123789-HxCDF	EPA 8290	ng/kg (dry)	All <	17.6	13.0	2	15.30	2.30	2.30		15.03
258	1234678-HpCDF	EPA 8290	ng/kg (dry)		3080.0	2930.0	2	3005.00	75.00	75.00		2.50
259	1234789-HpCDF	EPA 8290	ng/kg (dry)		108.0	90.0	2	99.00	9.00	9.00		9.09
260	OCDF	EPA 8290	ng/kg (dry)		2010.0	2270.0	2	2140.00	130.00	130.00		6.07
261												
262	Totals: Dioxins											
263	-TCDD	EPA 8290	ng/kg (dry)		376.0	290.0	2	333.00	43.00	43.00		12.91
264	-PeCDD	EPA 8290	ng/kg (dry)		620.0	476.0	2	548.00	72.00	72.00		13.14
265	-HxCDD	EPA 8290	ng/kg (dry)		900.0	725.0	2	812.50	87.50	87.50		10.77
266	-HpCDD	EPA 8290	ng/kg (dry)		1590.0	1450.0	2	1520.00	70.00	70.00		4.61
267												
268	Totals: Furans											
269	-TCDF	EPA 8290	ng/kg (dry)		4780.0	3780.0	2	4280.00	500.00	500.00		11.68
270	-PeCDF	EPA 8290	ng/kg (dry)		4740.0	3630.0	2	4185.00	555.00	555.00		13.26
271	-HxCDF	EPA 8290	ng/kg (dry)		5220.0	4610.0	2	4915.00	305.00	305.00		6.21
272	-HpCDF	EPA 8290	ng/kg (dry)		3760.0	3550.0	2	3655.00	105.00	105.00		2.87
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	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
289	Metals											
290	Ag	EPA 6010A	mg/kg (dry)		17.8	19.70	2	18.75	0.95	0.95		5.07
291	As	EPA 6010A	mg/kg (dry)		34.3	35.50	2	34.90	0.60	0.60		1.72
292	Be	EPA 6010A	mg/kg (dry)	All <	0.192	0.18	2	0.19	0.00	0.00		2.13
293	Cd	EPA 6010A	mg/kg (dry)		36	36.50	2	36.25	0.25	0.25		0.69
294	Cr	EPA 6010A	mg/kg (dry)		384	386.00	2	385.00	1.00	1.00		0.26
295	Cu	EPA 6010A	mg/kg (dry)		1160	1200.00	2	1180.00	20.00	20.00		1.69
296	Ni	EPA 6010A	mg/kg (dry)		290	289.00	2	289.50	0.50	0.50		0.17
297	Pb	EPA 6010A	mg/kg (dry)		624	632.00	2	628.00	4.00	4.00		0.64
298	Sb	EPA 6010A	mg/kg (dry)		8.41	6.96	2	7.69	0.73	0.72		9.43
299	Se	EPA 6010A	mg/kg (dry)		2.76	2.68	2	2.72	0.04	0.04		1.47
300	Tl	EPA 6010A	mg/kg (dry)		1.78	1.92	2	1.85	0.07	0.07		3.78
301	Zn	EPA 6010A	mg/kg (dry)		1690	1720.00	2	1705.00	15.00	15.00		0.88
302	Hg (total)	EPA 7471	mg/kg (dry)		2.87	3.24	2	3.06	0.19	0.19		6.08

A	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
337												
338	Metals (TCLP)											
339	-Arsenic	EPA 1311/3010/6010A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
340	-Barium	EPA 1311/3010/6010A	mg/L (extract)		0.5	0.5	2	0.50000	0.00000	0.00000		0.00
341	-Cadmium	EPA 1311/3010/6010A	mg/L (extract)		0.54	0.51	2	0.52500	0.01500	0.01500		2.86
342	-Chromium	EPA 1311/3010/6010A	mg/L (extract)		0.05	0.05	2	0.05000	0.00000	0.00000		0.00
343	-Lead	EPA 1311/3010/6010A	mg/L (extract)		0.1	0.09	2	0.09500	0.00500	0.00500		5.26
344	-Mercury	EPA 1311/7470	mg/L (extract)		0.001	0.001	2	0.00100	0.00000	0.00000		0.00
345	-Selenium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
346	-Silver	EPA 1311/3010/6010A	mg/L (extract)		0.01	0.01	2	0.01000	0.00000	0.00000		0.00
347												
348	Organo-Cl Pesticides (TCLP)											
349	-Chlordane	EPA 1311/8080	mg/L (extract)	All <	0.005	0.005	2	0.00500	0.00000	0.00000		0.00
350	-Endrin	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000		0.00
351	-Heptachlor	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000		0.00
352	-Heptachlor epoxide	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000		0.00
353	-Lindane (g-BHC)	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000		0.00
354	-Methoxychlor	EPA 1311/8080	mg/L (extract)	All <	0.001	0.001	2	0.00100	0.00000	0.00000		0.00
355	-Toxaphene	EPA 1311/8080	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000		0.00
356												
357	Cl Herbicides (TCLP)											
358	-2,4-D	EPA 1311/8150A (Mod)	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
359	-2,4,5-TP (Silvex)	EPA 1311/8150A (Mod)	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000		0.00
360												
361	Volatile Organics (TCLP)											
362	-Benzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
363	-Carbon tetrachloride	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
364	-Chlorobenzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
365	-Chloroform	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
366	-1,4-Dichlorobenzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
367	-1,2-Dichloroethane	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
368	-1,1-Dichloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
369	Methyl ethyl ketone	EPA 1311/8240A	mg/L (extract)	All <	5	5	2	5.00000	0.00000	0.00000		0.00
370	Tetrachloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
371	Trichloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
372	Vinyl chloride	EPA 1311/8240A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
373												
374	Semi-Volatiles (TCLP)											
375	-Hexachloroethane	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
376	-Nitrobenzene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
377	-Hexachlorobutadiene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
378	-2,4-Dinitrotoluene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
379	-Hexachlorobenzene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
380	-2,4,6-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
381	-2,4,5-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
382	-Pentachlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.25	0.25	2	0.25000	0.00000	0.00000		0.00
383	-Pyridine	EPA 1311/8270A	mg/L (extract)	All <	0.25	0.25	2	0.25000	0.00000	0.00000		0.00
384	-o-Cresol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00

A	A	B	C	D	E	F	G	H	I	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
385	-m,p-Cresols	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
386	-Total Cresols	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
387												
388	PAHs (TCLP)											
389	Naphthalene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
390	2-Methylnaphthalene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
391	Acenapthylene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
392	Acenaphthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
393	Dibenzofuran	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
394	Fluorene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
395	Phenanthrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
396	Anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
397	Fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
398	Pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
399	Benzo(a)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
400	Chrysene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
401	Benzo(b)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
402	Benzo(k)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
403	Benzo(a)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
404	Indeno(123-cd)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
405	Dibenz(a,h)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
406	Benzo(ghi)perylene	EPA 1311/8270A (Mod)	mg/L (extract)	All <			0	ERR	ERR	ERR		ERR
407												
408	Dioxins/Furans (TCLP)											
409	2378-TCDD	EPA 8290	ng/L (extract)	All <	0.0029	0.0006	2	0.00175	0.00115	0.00115		65.71
410	12378-PeCDD	EPA 8290	ng/L (extract)	All <	0.0056	0.0009	2	0.00325	0.00235	0.00235		72.31
411	123478-HxCDD	EPA 8290	ng/L (extract)	All <	0.0052	0.001	2	0.00310	0.00210	0.00210		67.74
412	123678-HxCDD	EPA 8290	ng/L (extract)	All <	0.0039	0.00045	2	0.00218	0.00173	0.00173		79.31
413	123789-HxCDD	EPA 8290	ng/L (extract)	All <	0.0049	0.0009	2	0.00290	0.00200	0.00200		68.97
414	1234678-HpCDD	EPA 8290	ng/L (extract)	Reject	0.0031	0.0017	2	0.00240	0.00070	0.00070		29.17
415	OCDD	EPA 8290	ng/L (extract)	Reject	0.0081	0.0078	2	0.00795	0.00015	0.00015		1.89
416												
417	2378-TCDF	EPA 8290	ng/L (extract)	All <	0.0042	0.00041	2	0.00231	0.00190	0.00190		82.21
418	12378-PeCDF	EPA 8290	ng/L (extract)	All <	0.0061	0.00061	2	0.00336	0.00275	0.00275		81.82
419	23478-PeCDF	EPA 8290	ng/L (extract)	All <	0.0057	0.00063	2	0.00317	0.00254	0.00254		80.09
420	123478-HxCDF	EPA 8290	ng/L (extract)	Reject	0.0054	0.0016	2	0.00350	0.00190	0.00190		54.29
421	123678-HxCDF	EPA 8290	ng/L (extract)	Reject	0.0045	0.00067	2	0.00259	0.00192	0.00192		74.08
422	234678-HxCDF	EPA 8290	ng/L (extract)	Reject	0.0068	0.0039	2	0.00535	0.00145	0.00145		27.10
423	123789-HxCDF	EPA 8290	ng/L (extract)	All <	0.0055	0.0007	2	0.00310	0.00240	0.00240		77.42
424	1234678-HpCDF	EPA 8290	ng/L (extract)	Reject	0.0043	0.0022	2	0.00325	0.00105	0.00105		32.31
425	1234789-HpCDF	EPA 8290	ng/L (extract)	All <	0.0041	0.0007	2	0.00240	0.00170	0.00170		70.83
426	OCDF	EPA 8290	ng/L (extract)	Reject	0.0066	0.0022	2	0.00440	0.00220	0.00220		50.00
427												
428	Totals: Dioxins											
429	-TCDD	EPA 8290	ng/L (extract)		0.0045	0.0022	2	0.00335	0.00115	0.00115		34.33
430	-PeCDD	EPA 8290	ng/L (extract)	All <	0.0056	0.0009	2	0.00325	0.00235	0.00235		72.31
431	-HxCDD	EPA 8290	ng/L (extract)	All <	0.0141	0.0042	2	0.00915	0.00495	0.00495		54.10
432	-HpCDD	EPA 8290	ng/L (extract)	All <	0.0031	0.0017	2	0.00240	0.00070	0.00070		29.17

A	A	B	C	D	E	F	G	H	J	J	K	L
7	Analyte	Method	Units		ME-01	ME-02	n	Mean	SD	SEMEAN		CV (%)
433												
434	Totals: Furans											
435	-TCDF	EPA 8290	ng/L (extract)	All <	0.0042	0.0004	2	0.00230	0.00190	0.00190		82.61
436	-PeCDF	EPA 8290	ng/L (extract)		0.0118	0.0013	2	0.00655	0.00525	0.00525		80.15
437	-HxCDF	EPA 8290	ng/L (extract)		0.0222	0.0083	2	0.01525	0.00695	0.00695		45.57
438	-HpCDF	EPA 8290	ng/L (extract)	All <	0.0085	0.0027	2	0.00560	0.00290	0.00290		51.79
439												
440												
441	PCBs (TCLP)											
442												
443	PCBs:	EPA MM680/HRGC/MS	ug/L (extract)									
444	2-Mono	Congenor #1	ug/L (extract)		0.0019	0.0017	2	0.00180	0.00010	0.00010		5.56
445	44'-Di	#15	ug/L (extract)		0.00069	0.00085	2	0.00077	0.00008	0.00008		10.39
446	244'-Tri	#28	ug/L (extract)	All <	0.00027	0.0004	2	0.00034	0.00007	0.00006		19.40
447	22'55'-Tetra	#52	ug/L (extract)	All <	0.0002	0.00023	2	0.00022	0.00001	0.00001		6.98
448	33'44'-Tetra	#77	ug/L (extract)	All <	0.00005	0.00004	2	0.00005	0.00001	0.00000		11.11
449	2344'5-Penta	#118	ug/L (extract)	All <	0.00008	0.00005	2	0.00007	0.00002	0.00002		23.08
450	233'44'-Penta	#105	ug/L (extract)	All <	0.00008	0.00005	2	0.00007	0.00002	0.00002		23.08
451	33'44'5-Penta	#126	ug/L (extract)	All <	0.00008	0.00005	2	0.00007	0.00002	0.00002		23.08
452	233'44'5-Hexa	#156	ug/L (extract)	All <	0.00007	0.00005	2	0.00006	0.00001	0.00001		16.67
453	33'44'55'-Hexa	#169	ug/L (extract)	All <	0.00008	0.00006	2	0.00007	0.00001	0.00001		14.29
454	22'344'55'-Hepta	#180	ug/L (extract)	All <	0.0001	0.00007	2	0.00009	0.00002	0.00001		17.65
455	22'33'44'55'-Octa	#194	ug/L (extract)	All <	0.0002	0.0001	2	0.00015	0.00005	0.00005		33.33
456	22'33'44'55'6-Nona	#206	ug/L (extract)	All <	0.0002	0.0001	2	0.00015	0.00005	0.00005		33.33
457	Deca	#209	ug/L (extract)	All <	0.0001	0.00008	2	0.00009	0.00001	0.00001		11.11
458												
459	PCB Totals:											
460	-Mono	EPA MM680/HRGC/MS	ug/L (extract)		0.0022	0.0034	2	0.00280	0.00060	0.00060		21.43
461	-Di	EPA MM680/HRGC/MS	ug/L (extract)		0.0036	0.0041	2	0.00385	0.00025	0.00025		6.49
462	-Tri	EPA MM680/HRGC/MS	ug/L (extract)		0.0011	0.003	2	0.00205	0.00095	0.00095		46.34
463	-Tetra	EPA MM680/HRGC/MS	ug/L (extract)		0.00051	0.001	2	0.00076	0.00025	0.00025		32.45
464	-Penta	EPA MM680/HRGC/MS	ug/L (extract)		0.00021	0.00022	2	0.00022	0.00000	0.00000		2.33
465	-Hexa	EPA MM680/HRGC/MS	ug/L (extract)	All <	0.00008	0.00007	2	0.00008	0.00000	0.00001		6.67
466	-Hepta	EPA MM680/HRGC/MS	ug/L (extract)	All <	0.0001	0.00004	2	0.00007	0.00003	0.00003		42.86
467	-Octa	EPA MM680/HRGC/MS	ug/L (extract)	All <	0.0002	0.0001	2	0.00015	0.00005	0.00005		33.33
468	-Nona	EPA MM680/HRGC/MS	ug/L (extract)	All <	0.0002	0.0001	2	0.00015	0.00005	0.00005		33.33
469												
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A	B	C	D	E	F	G	H	I	J	K	L
Analyte	Method	Units		ME-21	ME-22	n	Mean	SD	SEMEAN		CV (%)
Analytical Results for Metcalf & Eddy/GRS Solidified End Products											
(DIRECT SOLIDIFICATION OF SEDIMENT)				Direct	Solidification						
Analyte	Method	Units		ME-21	ME-22	n	Mean	SD	SEMEAN		CV (%)
Metals (TCLP)											
-Arsenic	EPA 1311/3010/6010A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-Barium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.5	0.5	2	0.50000	0.00000	0.00000		0.00
-Cadmium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000		0.00
-Chromium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000		0.00
-Lead	EPA 1311/3010/6010A	mg/L (extract)	All <	0.05	0.05	2	0.05000	0.00000	0.00000		0.00
-Mercury	EPA 1311/7470	mg/L (extract)	All <	0.001	0.001	2	0.00100	0.00000	0.00000		0.00
-Selenium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-Silver	EPA 1311/3010/6010A	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000		0.00
Organo-Cl Pesticides (TCLP)											
-Chlordane	EPA 1311/8080	mg/L (extract)	All <	0.005	0.005	2	0.00500	0.00000	0.00000		0.00
-Endrin	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000		0.00
-Heptachlor	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000		0.00
-Heptachlor epoxide	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000		0.00
-Lindane (g-BHC)	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	2	0.00050	0.00000	0.00000		0.00
-Methoxychlor	EPA 1311/8080	mg/L (extract)	All <	0.001	0.001	2	0.00100	0.00000	0.00000		0.00
-Toxaphene	EPA 1311/8080	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000		0.00
Cl Herbicides (TCLP)											
-2,4-D	EPA 1311/8150A (Mod)	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-2,4,5-TP (Silvex)	EPA 1311/8150A (Mod)	mg/L (extract)	All <	0.01	0.01	2	0.01000	0.00000	0.00000		0.00
Volatilve Organics (TCLP)											
-Benzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
-Carbon tetrachloride	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
-Chlorobenzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
-Chloroform	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
-1,4-Dichlorobenzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
-1,2-Dichloroethane	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
-1,1-Dichloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
Methyl ethyl ketone	EPA 1311/8240A	mg/L (extract)	All <	5	5	2	5.00000	0.00000	0.00000		0.00
Tetrachloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
Trichloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	2	0.20000	0.00000	0.00000		0.00
Vinyl chloride	EPA 1311/8240A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
Semi-Volatiles (TCLP)											
-Hexachloroethane	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-Nitrobenzene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-Hexachlorobutadiene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-2,4-Dinitrotoluene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-Hexachlorobenzene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-2,4,6-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
-2,4,5-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00

	A	B	C	D	E	F	G	H	I	J	K	L
4	Analyte	Method	Units		ME-21	ME-22	n	Mean	SD	SEMEAN		CV (%)
49	-Pentachlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.25	0.25	2	0.25000	0.00000	0.00000		0.00
50	-Pyridine	EPA 1311/8270A	mg/L (extract)	All <	0.25	0.25	2	0.25000	0.00000	0.00000		0.00
51	-o-Cresol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
52	-m,p-Cresols	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
53	-Total Cresols	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	2	0.10000	0.00000	0.00000		0.00
54												
55	PAHs (TCLP)			Not yet performed								
56	Naphthalene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
57	2-Methylnaphthalene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
58	Acenapthylene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
59	Acenaphthene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
60	Dibenzofuran	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
61	Fluorene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
62	Phenanthrene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
63	Anthracene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
64	Fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
65	Pyrene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
66	Benzo(a)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
67	Chrysene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
68	Benzo(b)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
69	Benzo(k)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
70	Benzo(a)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
71	Indeno(123-cd)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
72	Dibenz(a,h)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
73	Benzo(ghi)perylene	EPA 1311/8270A (Mod)	mg/L (extract)				0	ERR	ERR	ERR		ERR
74												
75	Dioxins/Furans			Not yet performed								
76	2378-TCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
77	12378-PeCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
78	123478-HxCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
79	123678-HxCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
80	123789-HxCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
81	1234678-HpCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
82	OCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
83												
84	2378-TCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
85	12378-PeCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
86	23478-PeCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
87	123478-HxCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
88	123678-HxCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
89	234678-HxCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
90	123789-HxCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
91	1234678-HpCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
92	1234789-HpCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
93	OCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
94												
95	Totals: Dioxins											
96	-TCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR

	A	B	C	D	E	F	G	H	I	J	K	L
4	Analyte	Method	Units		ME-21	ME-22	n	Mean	SD	SEMEAN		CV (%)
97	-PeCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
98	-HxCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
99	-HpCDD	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
100												
101	Totals: Furans											
102	-TCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
103	-PeCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
104	-HxCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
105	-HpCDF	EPA 8290	ng/L (extract)				0	ERR	ERR	ERR		ERR
106												
107												
108	PCBs (TCLP)			Not yet performed								
109												
110	PCBs:	EPA MM680/HRGC/MS	ug/L (extract)									
111	2-Mono	Congenor #1	ug/L (extract)				0	ERR	ERR	ERR		ERR
112	44'-Di	#15	ug/L (extract)				0	ERR	ERR	ERR		ERR
113	244'-Tri	#28	ug/L (extract)				0	ERR	ERR	ERR		ERR
114	22'55'-Tetra	#52	ug/L (extract)				0	ERR	ERR	ERR		ERR
115	33'44'-Tetra	#77	ug/L (extract)				0	ERR	ERR	ERR		ERR
116	2344'5-Penta	#118	ug/L (extract)				0	ERR	ERR	ERR		ERR
117	233'44'-Penta	#105	ug/L (extract)				0	ERR	ERR	ERR		ERR
118	33'44'5-Penta	#126	ug/L (extract)				0	ERR	ERR	ERR		ERR
119	233'44'5-Hexa	#156	ug/L (extract)				0	ERR	ERR	ERR		ERR
120	33'44'55'-Hexa	#169	ug/L (extract)				0	ERR	ERR	ERR		ERR
121	22'344'55'-Hepta	#180	ug/L (extract)				0	ERR	ERR	ERR		ERR
122	22'33'44'55'-Octa	#194	ug/L (extract)				0	ERR	ERR	ERR		ERR
123	22'33'44'55'6-Nona	#206	ug/L (extract)				0	ERR	ERR	ERR		ERR
124	Deca	#209	ug/L (extract)				0	ERR	ERR	ERR		ERR
125												
126	PCB Totals:											
127	-Mono	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
128	-Di	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
129	-Tri	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
130	-Tetra	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
131	-Penta	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
132	-Hexa	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
133	-Hepta	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
134	-Octa	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
135	-Nona	EPA MM680/HRGC/MS	ug/L (extract)				0	ERR	ERR	ERR		ERR
136												
137												
138												
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Above B.N.L

MAR-20-1996 17:27

DRAFT

Client: Brookhaven National Laboratory
Project Number: 36138D

Sample Report

Cont'd Spent Solvent

Client Sample ID:	ME-24
TLI Sample ID:	114-43-6
Date Received:	February 10, 1996
Date Prepared:	February 19, 1996
Date Analyzed:	February 23, 1996
Matrix:	solvent

Analyte	Conc. (ug/L)	mL Total Vol.	mL Aliquot	mL Final Vol.	Dilution Factor	mg/L Result
Ag	0.911	N/A	10	100	1	< 0.020
As	32.526	N/A	10	100	1	0.325
Be	0.211	N/A	10	100	1	< 0.010
Cd	3.359	N/A	10	100	1	0.034
Cr	72.833	N/A	10	100	1	0.728
Cu	78.538	N/A	10	100	1	0.785
Ni	39.742	N/A	10	100	1	0.397
Pb	309.363	N/A	10	100	1	3.09
Sb	3.319	N/A	10	100	1	< 0.040
Se	55.342	N/A	10	100	1	0.553
Tl	-11.902	N/A	10	100	1	< 0.050
Zn	126.386	N/A	10	100	1	1.26

Triangle Laboratories, Inc.
801 Capitola Drive * Durham, North Carolina 27713
Telc: (919) 544-5729 * Fax: (919) 544-5491

Printed: 27-Feb-96 at 10:23 AM

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Triangle Laboratories, Inc.
Project: 36138U
Sample Matrix: Oil/Liquid

Service Request: K9600929
Date Collected: NA
Date Received: 2/19/96
Date Extracted: 2/23/96

Chlorinated Herbicides
EPA Method 8150A Modified
DRAFT
Units: mg/Kg (ppm)
As Received

ME-24

Sample Name:	114-43-6
Lab Code:	K9600929-004
Date Analyzed:	2/27/96

Analyte	MRL	
Dalapon	30	ND
MCPP	600	ND
Dicamba	3	ND
MCPA	600	ND
Dichlorprop	3	ND
2,4-D	6	ND
2,4,5-TP (Silvex)	2	ND
2,4,5-T	2	ND
Dinoseb	15	ND
2,4-DB	15	ND

D The MRL is elevated because of matrix interferences and because the sample required diluting.

Approved By: _____ Date: 3-6-96

00003

Project 36138T 03/11/96

Method 8290X Full Screen Analyses (DB-5)

Data File	S961270	S961271
Sample ID	TLI Solvent Blank	ME-24
Units	ppt	ppt
Analytes		
2378-TCDD	(1.0)	8.0
12378-PeCDD	(0.2)	9.8
123478-HxCDD	(0.07)	10.2
123678-HxCDD	(0.06)	30.1
123789-HxCDD	(0.06)	(22.0)
1234678-HpCDD	0.04	499
OCDD	0.39	3710
2378-TCDF	(0.6)	75.4
12378-PeCDF	(0.2)	66.3
23478-PeCDF	(0.2)	34.0
123478-HxCDF	(0.06)	298
123678-HxCDF	(0.05)	110
234678-HxCDF	0.07	31.5
123789-HxCDF	(0.07)	(1.2)
1234678-HpCDF	(0.02)	1170
1234789-HpCDF	(0.05)	25.3
OCDF	(0.07)	1010
TOTAL TCDD	(1.0)	66.8
TOTAL PeCDD	(0.2)	93.9
TOTAL HxCDD	(0.07)	275
TOTAL HpCDD	0.07	1070
TOTAL TCDF	(0.6)	660
TOTAL PeCDF	0.40	752
TOTAL HxCDF	0.07	1100
TOTAL HpCDF	(0.02)	1430
Other Standards Percent Recovery Summary (% Rec)		
37Cl-TCDD	86.2	109
13C12-PeCDF 234	101	71.8
13C12-HxCDF 478	90.9	106
13C12-HxCDD 478	104	109
13C12-HpCDF 789	79.8	74.5
Other Standards Percent Recovery Summary (% Rec)		
13C12-HxCDF 789	95.5	94.0
13C12-HxCDF 234	97.9	97.9
Internal Standards Percent Recovery Summary (% Rec)		
13C12-2378-TCDF	2.5 V	59.6
13C12-2378-TCDD	2.0 V	83.0
13C12-PeCDF 123	9.4 V	57.2
13C12-PeCDD 123	19.5 V	64.1
13C12-HxCDF 678	38.9 V	90.6
13C12-HxCDD 678	56.9	90.2
13C12-HpCDF 678	60.3	70.1
13C12-HpCDD 678	71.8	70.0 RO
13C12-OCDD	66.7	79.8

(Estimated Maximum Possible Concentration), (Detection Limit).

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METHOD 8080 ANALYSIS DATA SHEET

SAMPLE NO.

ME-24

Lab Name: Triangle Labs of RTP, Inc. Project No.: 36138L 1

Matrix: CHEMICAL Lab Sample ID: 114-43-6

Sample wt/vol: 1.01000 G Lab File ID: MX12503

% Moisture/Lipid: NA Date Received: 02/10/96

Extraction: D/L Date Extracted: 02/19/96

Concentrated Extract Volume: 10.0 (mL) Date Analyzed: 02/27/96

Injection Volume: 1 (uL) Dilution Factor: 100.00

ppm

CAS NO.	COMPOUND	CONCENTRATION ug/G	Q
319-84-6	alpha-BHC	<4.95	UD
5103-71-9	a-Chlordane	<4.95	UD
309-00-2	Aldrin	<4.95	UD
319-85-7	beta-BHC	<4.95	UD
319-86-8	delta-BHC	<4.95	UD
72-54-8	4,4'-DDD	<9.90	UD
72-55-9	4,4'-DDE	<9.90	UD
50-29-3	4,4'-DDT	<9.90	UD
60-57-1	Dieldrin	<9.90	UD
72-20-8	Endrin	<9.90	UD
7421-93-4	Endrin Aldehyde	<9.90	UD
959-98-8	Endosulfan I	<4.95	UD
33212-65-9	Endosulfan II	<9.90	UD
1031-07-8	Endosulfan sulfate	<9.90	UD
58-89-9	gamma-BHC (Lindane)	<4.95	UD
5103-74-2	g-Chlordane	<4.95	UD
76-44-8	Heptachlor	<4.95	UD
1024-57-3	Heptachlor epoxide	<4.95	UD
72-43-5	Methoxychlor	<49.51	UD
8001-35-2	Toxaphene	<495.05	UD

U=undetected, J=estimated, P=%D>25, E=exceeds calib, D=diluted, X=%RSD>40

Prepared by KEH on 03/01/96 at 11:09:14

Triangle Laboratories of RTP
Project Summary for Project 36138HU

DRAFT

Client ID:	ME-24	SBLK 02259
Filename :	YL374	YL369
TLI Id :	114-43-6	SBLK 022596
Matrix :	solvent	CH2Cl2
Units :	ug/g	ug/g

Acenaphthene	0.74	(0.57)
2,4-Dinitrophenol	(5.00)	(5.60)
4-Nitrophenol	(2.71)	(3.04)
Dibenzofuran	0.52	(0.43)
Diethylphthalate	(0.40)	(0.45)
4-Chlorophenyl-phenylether	(1.05)	(1.17)
Fluorene	0.80	(0.59)
4-Nitroaniline	(1.77)	(1.98)
4,6-Dinitro-2-methylphenol	(2.76)	(2.90)
N-Nitrosodiphenylamine	(0.75)	(0.78)
4-Bromophenyl-phenylether	(1.60)	(1.68)
Hexachlorobenzene	(1.35)	(1.42)
Pentachlorophenol	(2.36)	(2.48)
Phenanthrene	2.56	(0.36)
Anthracene	1.76	(0.36)
Di-n-butylphthalate	0.67	(0.21)
Fluoranthene	5.67	(0.35)
Pyrene	5.38	(0.33)
Butylbenzylphthalate	0.66	(0.49)
3,3'-Dichlorobenzidine	(0.79)	(1.03)
bis(2-Ethylhexyl)phthalate	29.77	(0.34)
Benzo(a)anthracene	2.38	(0.35)
Chrysene	2.58	(0.36)
Di-n-octylphthalate	0.25	(0.21)
Benzo(b)fluoranthene	1.71	(0.35)
Benzo(k)fluoranthene	0.64	(0.37)
Benzo(e)pyrene	1.21	(0.38)
Benzo(a)pyrene	1.38	(0.36)
Perylene	0.22	(0.38)
Indeno(1,2,3-cd)pyrene	0.83	(0.35)
Dibenz(a,h)anthracene	0.43	(0.48)
Benzo(g,h,i)perylene	1.02	(0.39)

( )-Estimated Detection Limit Page 2

Triangle Laboratories of RTP, Inc.
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Triangle Laboratories of RTP
Project Summary for Project 36138HU

Client ID:	ME-24	SBLK 02259
		6
Filename :	YL374	YL376
TLI Id :	114-43-6	SBLK 022596
Matrix :	solvent	CH2Cl2
Units :	ug/g	ug/g

DRAFT

Phenol	1.11	(0.57)
bis(2-Chloroethyl)ether	(0.87)	(0.72)
2-Chlorophenol	(0.72)	(0.60)
1,3-Dichlorobenzene	(0.66)	(0.55)
1,4-Dichlorobenzene	0.30	(0.54)
1,2-Dichlorobenzene	6.00	(0.58)
2,2'-oxybis(1-Chloropropane)	(0.96)	(0.80)
Benzyl alcohol	(2.01)	(1.67)
2-Methylphenol	(1.00)	(0.83)
3/4-Methylphenol	(1.02)	(0.85)
N-Nitroso-di-n-propylamine	(1.24)	(1.03)
Hexachloroethane	(1.30)	(1.08)
Nitrobenzene	(0.69)	(0.66)
Isophorone	1.76	(0.40)
2-Nitrophenol	(1.28)	(1.22)
2,4-Dimethylphenol	(0.92)	(0.88)
bis(2-Chloroethoxy)methane	(0.70)	(0.66)
Benzoic acid	(1.60)	0.73
2,4-Dichlorophenol	(1.10)	(1.05)
1,2,4-Trichlorobenzene	(0.87)	(0.83)
Naphthalene	3.12	(0.26)
4-Chloroaniline	0.68	(0.81)
Hexachlorobutadiene	(1.26)	(1.21)
4-Chloro-3-methylphenol	(1.23)	(1.18)
2-Methylnaphthalene	4.63	(0.41)
Hexachlorocyclopentadiene	(1.24)	(1.39)
2,4,6-Trichlorophenol	(1.63)	(1.83)
2,4,5-Trichlorophenol	(1.61)	(1.80)
2-Chloronaphthalene	(0.48)	(0.54)
2-Nitroaniline	(1.76)	(1.97)
Dimethylphthalate	(0.49)	(0.55)
2,6-Dinitrotoluene	(2.08)	(2.33)
2,4-Dinitrotoluene	(1.52)	(1.70)
Acenaphthylene	0.59	(0.35)
3-Nitroaniline	(1.72)	(1.93)

( )-Estimated Detection Limit

Triangle Laboratories of RTP, Inc.
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DRAFT

Client: Brookhaven National Laboratory
Project Number: 36138D

Sample Report

Client Sample ID:	ME-24 D
TLI Sample ID:	114-43-6 D
Date Received:	February 10, 1996
Date Prepared:	February 19, 1996
Date Analyzed:	February 23, 1996
Matrix:	solvent

Analyte	Conc. (ug/L)	mL Total Vol.	mL Aliquot	mL Final Vol.	Dilution Factor	mg/L Result
Ag	0.924	N/A	10	100	1	< 0.020
As	28.081	N/A	10	100	1	0.281
Be	0.202	N/A	10	100	1	< 0.010
Cd	3.078	N/A	10	100	1	0.031
Cr	70.219	N/A	10	100	1	0.702
Cu	74.924	N/A	10	100	1	0.749
Ni	38.143	N/A	10	100	1	0.381
Pb	302.204	N/A	10	100	1	3.02
Sb	3.864	N/A	10	100	1	< 0.040
Se	37.715	N/A	10	100	1	0.377
Tl	-4.967	N/A	10	100	1	< 0.050
Zn	125.953	N/A	10	100	1	1.26

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DRAFT

Client: Brookhaven National Laboratory
Project Number: 36138D

Sample Report

Client Sample ID:	ME-24 L
TLI Sample ID:	114-43-6 L
Date Received:	February 10, 1996
Date Prepared:	February 19, 1996
Date Analyzed:	February 23, 1996
Matrix:	solvent

Analyte	Conc. (ug/L)	mL Total Vol.	mL Aliquot	mL Final Vol.	Dilution Factor		(ug/L) Result
Ag	0.230	N/A	10	100	5	<	0.100
As	8.443	N/A	10	100	5		0.422
Be	0.261	N/A	10	100	5	<	0.050
Cd	0.778	N/A	10	100	5	<	0.050
Cr	14.707	N/A	10	100	5		0.735
Cu	16.247	N/A	10	100	5		0.812
Ni	8.127	N/A	10	100	5		0.406
Pb	65.929	N/A	10	100	5		3.30
Sb	4.591	N/A	10	100	5		0.230
Se	10.842	N/A	10	100	5		0.542
Tl	-0.733	N/A	10	100	5	<	0.250
Zn	26.483	N/A	10	100	5		1.32

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Printed: 27-Feb-96 at 10:23 AM

Client: Brookhaven National Laboratory
Project Number: 36138D

DRAFT

Sample Report

Date Received:	February 10, 1995
Date Prepared:	February 22, 1995
Date Analyzed:	February 22, 1995
DATA FILE:	AB472
Matrix:	solvent

ANALYTE:	Hg
ug/L RDL:	0.2
Analysis Method:	7471
Instrument: P E Zeeman 5100	
Spike Conc. (ug/L)	5

CVAA ANALYTE SUMMARY REPORT

Client Sample ID	TLI SAMPID	ug/L CONC	ml MPV	gram wt. USED	DIL FACTOR	mg/Kg RESULT	Avg. RESULT	RPD	%REC
ME-24	114-43-6	0.040	100	0.202	1	< 0.099	--	--	--
ME-24 D	114-43-6 D	0.031	100	0.207	1	< 0.097	--	--	--
ME-24 T	114-43-6 T	0.031	100	0.209	1	< 0.096	< 0.097	--	--
ME-24 MS	114-43-6 MS	3.893	100	0.209	1	1.86	--	--	78%
ME-24 MSD	114-43-6 MSD	3.650	100	0.204	1	1.79	--	4.02%	73%
Method Blank	36138D MB	0.019	--	--	--	--	--	--	--
Method Blank D	36138D MB D	0.009	--	--	--	--	--	--	--
LCS	36138D LCS	4.958	--	--	--	--	--	--	99%
LCSD	36138D LCS D	5.222	--	--	--	--	--	--	104%
ME-24 MS	True Spike MS	5	100	0.209	1	2.39			
ME-24 MSD	True Spike MSD	5	100	0.204	1	2.45			

RECEIVED FAX FROM
DR. KEITH W. JONES
4/2/96

Analyte	Method	Units	#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
Analytical Results for Newtown Creek Sediments Collected on 11 October 1995														
Gross Physico-Chemical Properties														
Analyte	Method	Units	Replicate #1	Replicate #2	Replicate #3	Replicate #4	Replicate #5	Replicate #6	n	Mean	SD	SEMEAN		CV (%)
Particle size	ASTM D422 (Mod)	% wt (dry)												
Medium gravel > 4.75 mm	ASTM D422 (Mod)	% wt (dry)	0	0	0	0.18	0.04	0	6	0.04	0.07	0.03		179.30
Fine grave 2-4.75	ASTM D422 (Mod)	% wt (dry)	0.12	0	0.67	0.18	0.58	0.74	6	0.38	0.29	0.13		76.08
V. coarse sand 0.85-2	ASTM D422 (Mod)	% wt (dry)	0.78	1.61	0.6	0.92	0.51	0.57	6	0.83	0.37	0.17		45.04
Coarse sand 0.425-0.85	ASTM D422 (Mod)	% wt (dry)	2	2.4	1.9	2.2	1.96	2.42	6	2.16	0.21	0.09		9.68
Medium sand 0.24-0.425	ASTM D422 (Mod)	% wt (dry)	4.9	5	4.9	4.7	5.9	4.9	6	5.05	0.39	0.17		7.73
Fine sand 0.106-0.24	ASTM D422 (Mod)	% wt (dry)	9.3	9.8	9.5	8.9	10.5	9.8	6	9.57	0.48	0.22		5.04
V. fine sand 0.075-0.106	ASTM D422 (Mod)	% wt (dry)	3.1	3.1	2.9	2.9	1.7	3.1	6	2.80	0.50	0.22		17.86
Clay	ASTM D422 (Mod)	% wt (dry)	37.1	38.2	36.9	38	35.6	27.6	6	35.57	3.66	1.84		10.30
Silt	ASTM D422 (Mod)	% wt (dry)	41.7	43.8	40.8	43.1	44.3	56	6	44.95	5.08	2.27		11.31
pH	EPA 9045A	pH units	7.96	7.96	7.74	7.85	7.68	8.22	6	7.90	0.18	0.08		2.23
Solids (total)	EPA 160.3	% wt (dry)	34.1	32.7	33.2	32.6	33.3	32.4	6	33.05	0.57	0.25		1.72
Sulfides (total)	EPA 9030M	mg/kg (dry)	6200	8200	5900	8500	8500	9700	6	7833.33	1348.86	603.14		17.22
Organic carbon (total)	ASTM D4129-82M	% wt (dry)	7.25	7.4	7.7	7.48	7.06	7.02	6	7.32	0.23	0.10		3.20

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7	Analyte	Method	Units		#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
66	Polychlorinated Biphenyls															
67																
68	PCBs:	EPA MM680/HRGC/MS	ug/kg (dry)													
69	2-Mono	Congenor #1	ug/kg (dry)		72	50	56	55	64	47	6	57.33	8.44	3.77		14.72
70	44'-Di	#15	ug/kg (dry)		79	59	62	63	73	52	6	64.67	8.92	3.99		13.79
71	244'-Tri	#28	ug/kg (dry)		193	157	187	153	186	133	6	168.17	21.91	9.80		13.03
72	22'55'-Tetra	#52	ug/kg (dry)		308	237	235	220	406	210	6	269.33	68.74	30.74		25.52
73	33'44'-Tetra	#77	ug/kg (dry)		18	12	13	13	19	10	6	13.83	2.91	1.30		21.04
74	2344'5-Penta	#118	ug/kg (dry)		8	5	6	5	7	5	6	6.00	1.15	0.52		19.25
75	233'44'-Penta	#105	ug/kg (dry)		77	54	68	57	88	58	6	66.67	11.63	5.20		17.44
76	33'44'5-Penta	#126	ug/kg (dry)		0.6	0.4	0.4		0.6		4	0.50	0.10	0.08		20.00
77	233'44'5-Hexa	#156	ug/kg (dry)		19.7	14	21	15	18	16	6	17.12	2.62	1.17		15.31
78	33'44'55'-Hexa	#169	ug/kg (dry)	All <	<0.5	<0.4	<0.5	<0.5	<0.8	<0.3		0.00	0.00	0.00		ERR
79	22'344'55'-Hepta	#180	ug/kg (dry)		88.9	62.5	76.3	71.9	79	61.6	6	73.37	9.49	4.24		12.93
80	22'33'44'55'-Octa	#194	ug/kg (dry)		20	15.5	17.2	16.4	17.5	16	6	17.10	1.46	0.65		8.55
81	22'33'44'55'8-Nona	#206	ug/kg (dry)		15	10.8	11	11.2	12.1	11.5	6	11.93	1.43	0.64		12.00
82	Deca	#209	ug/kg (dry)		9.9	5.8	6.5	6.7	8.3	6	6	7.20	1.45	0.65		20.16
83																
84	PCB Totals:															
85	-Mono	EPA MM680/HRGC/MS	ug/kg (dry)		135	95.5	104	106	122	89.2	6	108.62	15.56	6.96		14.32
86	-Di	EPA MM680/HRGC/MS	ug/kg (dry)		475	347	391	359	403	301	6	379.33	53.92	24.11		14.21
87	-Tri	EPA MM680/HRGC/MS	ug/kg (dry)		863	658	732	649	881	584	6	727.83	110.70	49.51		15.21
88	-Tetra	EPA MM680/HRGC/MS	ug/kg (dry)		1880	1570	1400	1350	2130	1240	6	1586.33	313.87	140.37		19.76
89	-Penta	EPA MM680/HRGC/MS	ug/kg (dry)		1550	1040	1200	1000	1550	1080	6	1236.67	229.83	102.78		18.58
90	-Hexa	EPA MM680/HRGC/MS	ug/kg (dry)		974	668	946	698	865	712	6	808.83	124.54	55.70		15.40
91	-Hepta	EPA MM680/HRGC/MS	ug/kg (dry)		383	249	308	285	318	248	6	294.50	40.60	18.16		13.79
92	-Octa	EPA MM680/HRGC/MS	ug/kg (dry)		112	86.9	97	89.5	99.6	89.8	6	95.83	8.51	3.81		8.88
93	-Nona	EPA MM680/HRGC/MS	ug/kg (dry)		25.4	18.4	19	18.9	21.2	19.4	6	20.38	2.41	1.08		11.82
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Analyte	Method	Units		#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
Chlorinated Pesticides and Herbicides															
Pesticides (Cl):															
a-BHC	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
a-Chlordane	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
Aldrin	EPA 8080	ug/kg (dry)		85.8	64.6	79.3	65.7	63.3	101.4	6	75.02	15.80	7.07		21.06
beta-BHC	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
delta-BHC	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
4,4'-DDD	EPA 8080	ug/kg (dry)		161.5	130.6	178.1	149.1	113.3	240	6	162.10	40.55	16.14		25.02
4,4'-DDE	EPA 8080	ug/kg (dry)		159.1	126.1	185.6	117.5	92.8	223.3	6	150.57	43.98	19.67		29.21
4,4'-DDT	EPA 8080	ug/kg (dry)	All <	29.1	29.4	29.1	28.3	29.2	28.3		28.90	0.44	0.19		1.51
Dieldrin	EPA 8080	ug/kg (dry)		78.1	57.3	83.7	65.9	48.1	113.6	6	74.45	21.19	9.47		28.48
Endrin	EPA 8080	ug/kg (dry)	All <	29.1	29.4	29.1	28.3	29.2	28.3		28.90	0.44	0.19		1.51
Endrin aldehyde	EPA 8080	ug/kg (dry)	All <	29.1	29.4	29.1	28.3	29.2	28.3		28.90	0.44	0.19		1.51
Endosulfan I	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
Endosulfan II	EPA 8080	ug/kg (dry)	All <	29.1	29.4	29.1	28.3	29.2	28.3		28.90	0.44	0.19		1.51
Endosulfan sulfate	EPA 8080	ug/kg (dry)	All <	29.1	29.4	29.1	28.3	29.2	28.3		28.90	0.44	0.19		1.51
g-BHC (Lindane)	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
g-Chlordane	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
Heptachlor	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
Heptachlor epoxide	EPA 8080	ug/kg (dry)	All <	14.6	14.7	14.6	14.1	14.6	14.2		14.47	0.23	0.10		1.58
Methoxychlor	EPA 8080	ug/kg (dry)	All <	145.7	146.9	145.7	141.5	145.9	141.5		144.53	2.18	0.98		1.51
Toxaphene	EPA 8080	ug/kg (dry)	All <	1456.6	1468.7	1456.5	1414.6	1459.1	1415.4		1445.15	21.71	9.71		1.50
Chlorinated Herbicides															
2,4-D	EPA 8150A (Mod)	mg/kg (dry)	All <	0.2	0.2	0.2	0.2	0.2	0.2		0.20	0.00	0.00		0.00
2,4,5-TP (Silvex)	EPA 8150A (Mod)	mg/kg (dry)	All <	0.05	0.05	0.05	0.05	0.05	0.05		0.05	0.00	0.00		0.00
2,4,5-T	EPA 8150A (Mod)	mg/kg (dry)	All <	0.05	0.05	0.05	0.05	0.05	0.05		0.05	0.00	0.00		0.00

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7	Analyte	Method	Units		#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		ICV (%)
196																
197	Semi-Volatile Compounds (Including PAHs)															
198																
199																
200	Semivolatiles:		ug/kg (dry)		1176		373	365			3	638.00	380.44	269.01		59.63
201	Phenol	EPA 8270A	ug/kg (dry)	All <	819	688	768	760	794	700		754.50	47.04	21.04		6.23
202	bis(2-Chloroethyl)ether	EPA 8270A	ug/kg (dry)	All <	751	630	702	697	728	642		691.67	43.29	19.36		6.26
203	2-Chlorophenol	EPA 8270A	ug/kg (dry)	All <	551	462	515	511	534	471		507.33	31.79	14.22		6.27
204	1,3-Dichlorobenzene	EPA 8270A	ug/kg (dry)	All <	561	471	525	521	544	480		517.00	32.22	14.41		6.23
205	1,4-Dichlorobenzene	EPA 8270A	ug/kg (dry)	All <	623	523	582	578	604	532		573.67	35.93	16.07		6.26
206	1,2-Dichlorobenzene	EPA 8270A	ug/kg (dry)	All <	1496	1256	1399	1389	1451	1279		1378.33	86.12	38.51		6.25
207	Benzyl alcohol	EPA 8270A	ug/kg (dry)	All <	938	787	877	871	910	802		864.17	54.13	24.21		6.26
208	2,2'-oxybis(1-Chloropropane)	EPA 8270A	ug/kg (dry)	All <	950	798	888	882	921	813		875.50	54.40	24.33		6.21
209	2-Methylphenol	EPA 8270A	ug/kg (dry)	All <	1275	1218	1705	1306	1599	1236	6	1389.67	180.02	84.98		13.67
210	3/4-Methylphenol	EPA 8270A	ug/kg (dry)		1185	994	1108	1100	1149	1013		1091.50	68.39	30.58		6.27
211	N-Nitroso-di-n-propylamine	EPA 8270A	ug/kg (dry)	All <	1350	1133	1263	1253	1309	1155		1243.83	77.62	34.71		6.24
212	Hexachloroethane	EPA 8270A	ug/kg (dry)	All <	610	547	585	570	587	526		570.83	27.61	12.35		4.84
213	Nitrobenzene	EPA 8270A	ug/kg (dry)	All <	357	320	343	334	344	308		334.33	16.23	7.26		4.86
214	Isophorone	EPA 8270A	ug/kg (dry)	All <	1127	1010	1081	1053	1085	972		1054.67	51.12	22.86		4.85
215	2-Nitrophenol	EPA 8270A	ug/kg (dry)	All <	768	687	795	716	738	661		717.17	34.65	15.49		4.83
216	2,4-Dimethylphenol	EPA 8270A	ug/kg (dry)	All <	676	605	648	631	650	582		631.83	30.71	13.73		4.86
217	bis(2-Chloroethoxy)methane	EPA 8270A	ug/kg (dry)	All <	1427	1278	1368	1333	1374	1230		1335.17	64.86	29.01		4.86
218	Benzoic acid	EPA 8270A	ug/kg (dry)	All <	731	658	701	683	704	631		684.33	32.89	14.71		4.81
219	2,4-Dichlorophenol	EPA 8270A	ug/kg (dry)	All <	666	597	639	622	641	574		623.17	30.30	13.55		4.86
220	1,2,4-Trichlorobenzene	EPA 8270A	ug/kg (dry)		2639	2814	2569	3126	2736	2488	6	2728.67	207.23	92.68		7.59
221	Naphthalene	EPA 8270A	ug/kg (dry)		1053	1084	946	784	1124	1026	6	1002.83	112.13	50.15		11.18
222	4-Chloroaniline	EPA 8270A	ug/kg (dry)	All <	780	682	729	710	732	655		711.33	34.50	15.43		4.85
223	Hexachlorobutadiene	EPA 8270A	ug/kg (dry)	All <	897	804	860	838	863	773		839.17	40.75	18.22		4.86
224	4-Chloro-3-methylphenol	EPA 8270A	ug/kg (dry)		2380	2312	1894	2388	2417	2435	6	2304.00	187.35	83.78		8.13
225	2-Methylnaphthalene	EPA 8270A	ug/kg (dry)		734	641	675	675	705	580		668.33	48.81	21.83		7.30
226	Hexachlorocyclopentadiene	EPA 8270A	ug/kg (dry)	All <	926	808	852	852	888	732		843.17	61.63	27.52		7.30
227	2,4,6-Trichlorophenol	EPA 8270A	ug/kg (dry)	All <	876	765	806	806	842	693		798.00	58.11	25.99		7.28
228	2,4,5-Trichlorophenol	EPA 8270A	ug/kg (dry)	All <	408	354	374	373	390	321		369.67	27.01	12.08		7.31
229	2-Chloronaphthalene	EPA 8270A	ug/kg (dry)	All <	1198	1047	1104	1103	1152	948		1092.17	79.66	35.63		7.29
230	2-Nitroaniline	EPA 8270A	ug/kg (dry)	All <	343	299	316	315	329	271		312.17	22.82	10.21		7.31
231	Dimethylphthalate	EPA 8270A	ug/kg (dry)	All <	1524	1330	1403	1402	1464	1205		1388.00	101.28	45.29		7.30
232	2,6-Dinitrotoluene	EPA 8270A	ug/kg (dry)	All <	1111	970	1023	1022	1067	878		1011.83	73.90	33.05		7.30
233	2,4-Dinitrotoluene	EPA 8270A	ug/kg (dry)		14271	1265	1100	1213	1420	1316	6	1288.50	115.17	51.51		8.94
234	Acenaphthylene	EPA 8270A	ug/kg (dry)	All <	1483	1294	1365	1364	1424	1172		1350.33	98.66	44.12		7.31
235	3-Nitroaniline	EPA 8270A	ug/kg (dry)		981	1050	879	1089	1149	1106	6	1042.33	89.54	40.04		8.59
236	Acenaphthene	EPA 8270A	ug/kg (dry)	All <	2709	2385	2493	2492	2603	2142		2467.33	180.00	80.50		7.30
237	2,4-Dinitrophenol	EPA 8270A	ug/kg (dry)	All <	1777	1551	1635	1634	1707	1405		1618.17	118.04	52.79		7.29
238	4-Nitrophenol	EPA 8270A	ug/kg (dry)		1357	1250	994	1125	1143	1163	6	1172.00	111.90	50.04		9.55
239	Dibenzofuran	EPA 8270A	ug/kg (dry)	All <	303	265	279	279	291	240		276.17	19.95	8.92		7.23
240	Diethylphthalate	EPA 8270A	ug/kg (dry)	All <	593	518	546	546	570	469		540.33	39.38	17.61		7.29
241	4-Chlorophenyl-phenylether	EPA 8270A	ug/kg (dry)		1529	1458	1200	1342	1537	1289	6	1389.17	126.19	57.39		9.23
242	Fluorene	EPA 8270A	ug/kg (dry)	All <	1449	1264	1933	1332	1391	1145		1319.00	98.38	43.11		7.31
243	4-Nitroaniline	EPA 8270A	ug/kg (dry)	All <	2064	1701	1798	1779	1695	1361		1731.33	204.21	91.33		11.80
244	4,6-Dinitro-2-methylphenol	EPA 8270A	ug/kg (dry)	All <	672	557	588	582	555	445		586.50	66.85	29.90		11.80
245	N-Nitrosodiphenylamine	EPA 8270A	ug/kg (dry)	All <	1205	998	1055	1044	996	799		1016.17	119.61	53.49		11.77
246	4-Bromophenyl-phenylether	EPA 8270A	ug/kg (dry)	All <	924	766	809	800	783	612		779.00	91.91	41.10		11.80
247	Hexachlorobenzene	EPA 8270A	ug/kg (dry)	All <	1232	1021	1079	1067	1017	817		1038.83	122.29	54.69		11.77
248	Pentachlorophenol	EPA 8270A	ug/kg (dry)		7229	6911	5453	6263	6927	6733	6	6586.00	583.61	261.09		8.86
249	Phenanthrene	EPA 8270A	ug/kg (dry)		4862	3772	3005	3315	3765	3494	6	3702.17	582.14	260.34		15.72
250	Anthracene	EPA 8270A	ug/kg (dry)		1372	927	1811	1233		790	5	1226.80	358.63	179.32		29.24
251	Di-n-butyl phthalate	EPA 8270A	ug/kg (dry)		11263	10846	8060	9511	11758	10504	6	10923.67	1226.76	548.62		11.68
252	Fluoranthene	EPA 8270A	ug/kg (dry)		7382	7403	5868	6551	7689	7717	6	7101.67	664.09	298.99		9.35
253	Pyrene	EPA 8270A	ug/kg (dry)		1463	1345	1379	2385	1001	1266	6	1473.17	432.57	193.46		29.36
254	Butylbenzylphthalate	EPA 8270A	ug/kg (dry)	All <	325	293	308	284	278	240		287.67	26.64	11.91		9.26
255	3,3'-Dichlorobenzidine	EPA 8270A	ug/kg (dry)		48993	62435	40301	46073	44606	49377	6	48630.83	6872.39	3073.39		14.13
256	bis-2-ethylhexylphthalate	EPA 8270A	ug/kg (dry)		5165	4717	3741	4118	4454	4710	6	4484.17	457.54	204.62		10.20
257	Benzo(a)anthracene	EPA 8270A	ug/kg (dry)		5080	4885	3475	4179	4829	4938	6	4584.33	564.73	252.56		12.37
258	Chrysene	EPA 8270A	ug/kg (dry)	Rejected												
259	Di-n-octylphthalate	EPA 8270A	ug/kg (dry)		3309	2943	2247	2552	3144	3338	6	2922.17	401.08	179.36		13.72
260	Benzo(b)fluoranthene	EPA 8270A	ug/kg (dry)													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7	Analyte	Method	Units		#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
261	Benzo(k)fluoranthene	EPA 8270A	ug/kg (dry)		1127	947	926	1035	1377	1230	6	1107.33	158.77	71.01		14.34
262	Benzo(a)pyrene	EPA 8270A	ug/kg (dry)		2851	2533	2139	2218	2794	2770	6	2550.83	282.24	126.22		11.06
263	Indeno(123-cd)pyrene	EPA 8270A	ug/kg (dry)		1444	1137	928	763	1195	987	6	1075.67	216.45	96.80		20.12
264	Dibenz(a,h)anthracene	EPA 8270A	ug/kg (dry)		877	343		305	341	319	5	397.00	140.71	70.36		35.44
265	Benzo(ghi)perylene	EPA 8270A	ug/kg (dry)		1743	1461	1225	694	1221	1182	6	1254.33	316.93	141.74		25.27
266	Benzo(e)pyrene	EPA 8270A	ug/kg (dry)		2430	2126	1672	1900	2327	2298	6	2125.50	264.45	118.26		12.44
267	Perylene	EPA 8270A	ug/kg (dry)		1152	890	829	803	1023	985	6	948.50	119.88	53.60		12.64

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7	Analyte	Method	Units		#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
326																
327	Dioxins and Furans															
328																
329																
330	Dioxins and Furans															
331	2378-TCDD	EPA 8290	ng/kg (dry)		43.1		36.6	43.6	40.5	43.8	5	41.52	2.73	1.97		6.58
332	12378-PeCDD	EPA 8290	ng/kg (dry)		42.9		42.8	50.9	104		4	60.15	25.53	14.74		42.44
333	123478-HxCDD	EPA 8290	ng/kg (dry)		51.1	54.5	47.3	48.4		44.8	5	49.22	3.33	1.66		6.76
334	123678-HxCDD	EPA 8290	ng/kg (dry)		131	139	120	146	180	134	6	141.67	18.87	8.44		13.32
335	123789-HxCDD	EPA 8290	ng/kg (dry)		137	157	120	146		108	5	133.60	17.62	8.81		13.19
336	1234678-HpCDD	EPA 8290	ng/kg (dry)		2040	2300	2070	2170	2190	1760	6	2091.67	163.04	72.91		7.79
337	OCDD	EPA 8290	ng/kg (dry)		17080	21150	16320	18070	15830	18230	6	17463.33	1792.85	801.79		10.27
338																
339	2378-TCDF	EPA 8290	ng/kg (dry)		348	352	320	364	310	348	6	340.00	18.80	8.41		5.53
340	12378-PeCDF	EPA 8290	ng/kg (dry)		280	283	263	294	369	376	6	310.83	44.58	19.94		14.34
341	23478-PeCDF	EPA 8290	ng/kg (dry)		135	151	133	161		152	5	146.40	10.73	5.36		7.33
342	123478-HxCDF	EPA 8290	ng/kg (dry)		1360	1250	1200	1380	1320	1290	6	1300.33	65.49	29.29		5.02
343	123678-HxCDF	EPA 8290	ng/kg (dry)		450	463	435	495	484	457	6	464.00	20.20	9.03		4.35
344	234678-HxCDF	EPA 8290	ng/kg (dry)		191	193	163	197	207	165	6	186.00	16.38	7.32		8.80
345	123789-HxCDF	EPA 8290	ng/kg (dry)		6.7			6.8	56.4		3	23.23	23.45	16.58		100.94
346	1234678-HpCDF	EPA 8290	ng/kg (dry)		6080	4390	4730	5400	4430	4780	6	4968.33	597.03	267.00		12.02
347	1234789-HpCDF	EPA 8290	ng/kg (dry)		104	117	98.8	124	124	95.3	6	110.52	11.67	5.22		10.56
348	OCDF	EPA 8290	ng/kg (dry)		4130	4080	4150	4840	4200	5110	6	4418.33	402.80	180.14		9.12
349																
350	Totals: Dioxins															
351	-TCDD	EPA 8290	ng/kg (dry)		289	501	203	265	90.6	128	6	246.10	133.64	59.77		54.30
352	-PeCDD	EPA 8290	ng/kg (dry)		314	640	375	451	320	169	6	378.17	144.41	64.58		38.19
353	-HxCDD	EPA 8290	ng/kg (dry)		1340	1580	1260	1420	1370	1250	6	1370.00	111.06	49.67		8.11
354	-HpCDD	EPA 8290	ng/kg (dry)		4240	4970	4340	4620	4510	4020	6	4450.00	301.11	134.66		6.77
355																
356	Totals: Furans															
357	-TCDF	EPA 8290	ng/kg (dry)		2300	2730	2450	2790	1970	1990	6	2371.67	321.89	143.95		13.57
358	-PeCDF	EPA 8290	ng/kg (dry)		2390	2510	2270	2730	3920	3900	6	2853.33	577.54	258.28		20.24
359	-HxCDF	EPA 8290	ng/kg (dry)		5420	4980	4800	5700	5130	5040	6	5175.00	300.76	134.51		5.81
360	-HpCDF	EPA 8290	ng/kg (dry)		7210	5550	5780	6660	5390	5820	6	6068.33	648.98	290.23		10.69
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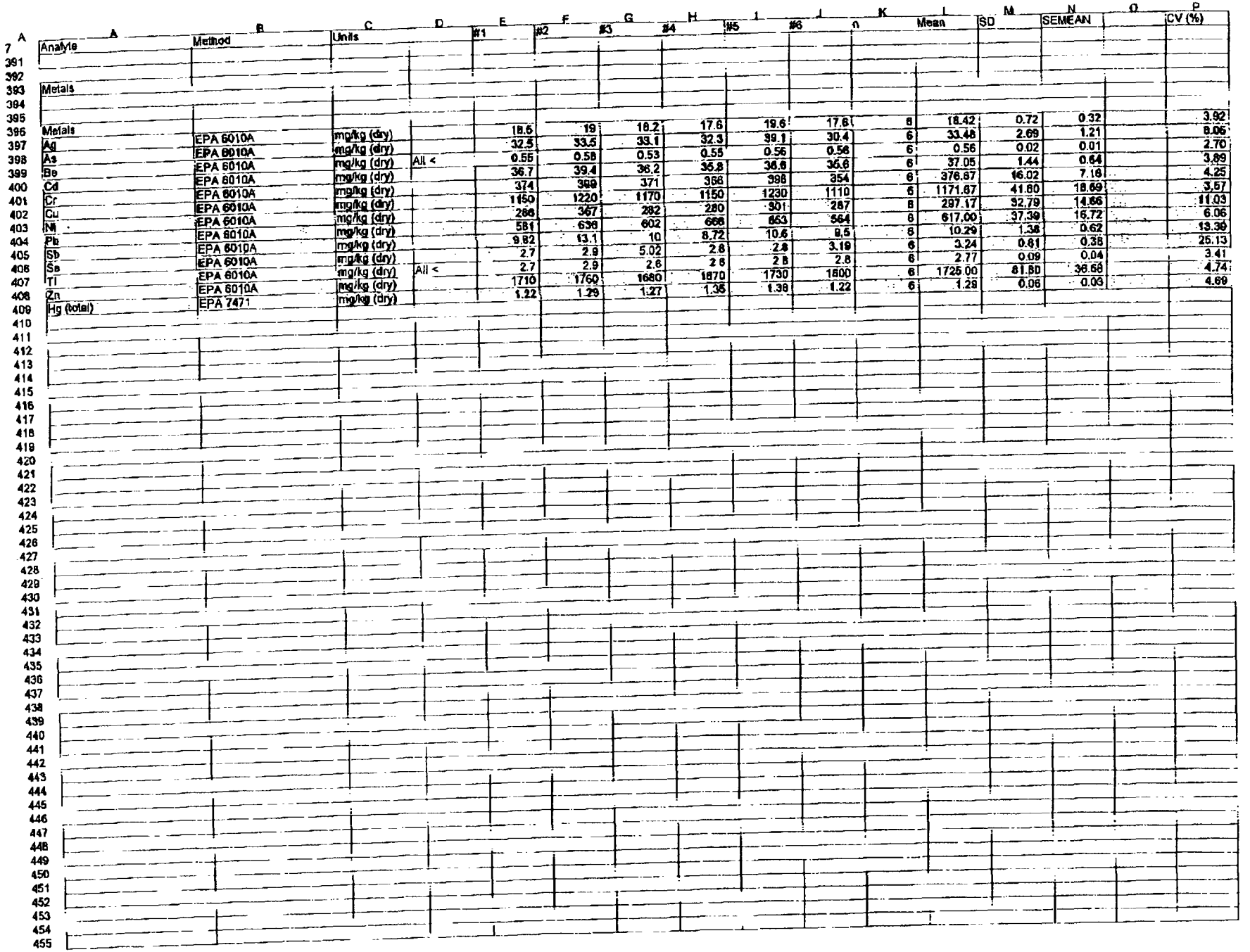

Analyte	Method	Units	D	#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
Metals															
Metals	EPA 6010A	mg/kg (dry)		18.6	19	18.2	17.6	19.6	17.6	6	18.42	0.72	0.32		3.92
Ag	EPA 6010A	mg/kg (dry)		32.5	33.5	33.1	32.3	33.1	30.4	6	33.48	2.69	1.21		8.06
As	EPA 6010A	mg/kg (dry)	All <	0.55	0.58	0.53	0.55	0.56	0.56	6	0.56	0.02	0.01		2.70
Be	EPA 6010A	mg/kg (dry)		36.7	39.4	36.2	35.8	36.6	36.6	6	37.05	1.44	0.64		3.89
Cd	EPA 6010A	mg/kg (dry)		374	389	371	366	398	354	6	376.67	16.02	7.16		4.25
Cr	EPA 6010A	mg/kg (dry)		1150	1220	1170	1150	1230	1110	6	1171.67	41.80	18.69		3.57
Cu	EPA 6010A	mg/kg (dry)		286	367	282	280	301	287	6	297.17	32.79	14.66		11.03
Ni	EPA 6010A	mg/kg (dry)		581	636	602	666	663	564	6	617.00	37.39	16.72		6.06
Pb	EPA 6010A	mg/kg (dry)		9.82	13.1	10	8.72	10.6	9.5	6	10.29	1.38	0.62		13.36
Sb	EPA 6010A	mg/kg (dry)		2.7	2.9	5.02	2.8	2.8	3.19	6	3.24	0.81	0.36		25.13
Se	EPA 6010A	mg/kg (dry)		2.7	2.9	2.6	2.8	2.8	2.8	6	2.77	0.09	0.04		3.41
Tl	EPA 6010A	mg/kg (dry)	All <	1710	1760	1680	1870	1730	1600	6	1725.00	81.80	36.58		4.74
Zn	EPA 6010A	mg/kg (dry)		1.22	1.29	1.27	1.35	1.38	1.22	6	1.28	0.06	0.03		4.69
Hg (total)	EPA 7471	mg/kg (dry)													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7	Analyte	Method	Units		#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
456																
457	Toxicity Characteristic Leaching Potential (TCLP)															
458																
459	Metals (TCLP)															
460	-Arsenic	EPA 1311/3010/6010A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
461	-Barium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.5	0.5	0.5	0.5	0.5	0.5	6	0.50000	0.00000	0.00000		0.00
462	-Cadmium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.01	0.01	0.01	0.01	0.01	0.01	6	0.01000	0.00000	0.00000		0.00
463	-Chromium	EPA 1311/3010/6010A	mg/L (extract)		0.03	0.03	0.02	0.03	0.03	0.03	6	0.02833	0.00373	0.00167		13.16
464	-Lead	EPA 1311/3010/6010A	mg/L (extract)	All <	0.05	0.05	0.05	0.05	0.05	0.05	6	0.05000	0.00000	0.00000		0.00
465	-Mercury	EPA 1311/7470	mg/L (extract)	All <	0.001	0.001	0.001	0.001	0.001	0.001	6	0.00100	0.00000	ERR		0.00
466	-Selenium	EPA 1311/3010/6010A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
467	-Silver	EPA 1311/3010/6010A	mg/L (extract)	All <	0.01	0.01	0.01	0.01	0.01	0.01	6	0.01000	0.00000	0.00000		0.00
468																
469	Organo-Cl Pesticides (TCLP)															
470	-Chlordane	EPA 1311/8080	mg/L (extract)	All <	0.005	0.005	0.005	0.005	0.005	0.005	6	0.00500	0.00000	0.00000		0.00
471	-Endrin	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	6	0.00050	0.00000	ERR		0.00
472	-Heptachlor	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	6	0.00050	0.00000	ERR		0.00
473	-Heptachlor epoxide	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	6	0.00050	0.00000	ERR		0.00
474	-Lindane (g-BHC)	EPA 1311/8080	mg/L (extract)	All <	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	6	0.00050	0.00000	ERR		0.00
475	-Methoxychlor	EPA 1311/8080	mg/L (extract)	All <	0.001	0.001	0.001	0.001	0.001	0.001	6	0.00100	0.00000	ERR		0.00
476	-Toxaphene	EPA 1311/8080	mg/L (extract)	All <	0.01	0.01	0.01	0.01	0.01	0.01	6	0.01000	0.00000	0.00000		0.00
477																
478	Cl Herbicides (TCLP)															
479	-2,4-D	EPA 1311/8150A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
480	-2,4,5-TP (Silvex)	EPA 1311/8150A (Mod)	mg/L (extract)	All <	0.01	0.01	0.01	0.01	0.01	0.01	6	0.01000	0.00000	0.00000		0.00
481																
482	Volative Organics (TCLP)															
483	-Benzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
484	-Carbon tetrachloride	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
485	-Chlorobenzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
486	-Chloroform	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
487	-1,4-Dichlorobenzene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
488	-1,2-Dichloroethane	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
489	-1,1-Dichloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
490	Methyl ethyl ketone	EPA 1311/8240A	mg/L (extract)	All <	5	5	5	5	5	5	6	5.00000	0.00000	0.00000		0.00
491	Tetrachloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
492	Trichloroethene	EPA 1311/8240A	mg/L (extract)	All <	0.2	0.2	0.2	0.2	0.2	0.2	6	0.20000	0.00000	0.00000		0.00
493	Vinyl chloride	EPA 1311/8240A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
494																
495	Semi-Volatiles (TCLP)															
496	-Hexachloroethane	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
497	-Nitrobenzene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
498	-Hexachlorobutadiene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
499	-2,4-Dinitrotoluene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
500	-Hexachlorobenzene	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
501	-2,4,6-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
502	-2,4,5-Trichlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
503	-Pentachlorophenol	EPA 1311/8270A	mg/L (extract)	All <	0.25	0.25	0.25	0.25	0.25	0.25	6	0.25000	0.00000	0.00000		0.00
504	-Pyridine	EPA 1311/8270A	mg/L (extract)	All <	0.25	0.25	0.25	0.25	0.25	0.25	6	0.25000	0.00000	0.00000		0.00
505	-o-Cresol	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
506	-m,p-Cresols	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
507	-Total Cresols	EPA 1311/8270A	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
508																
509	PAHs (TCLP)															
510	Naphthalene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
511	2-Methylnaphthalene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
512	Acenapthylene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
513	Acenaphthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
514	Dibenzofuran	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
515	Fluorene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
516	Phenanthrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
517	Anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
518	Fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
519	Pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
520	Benzo(a)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A	Analyte	Method	Units		#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
7	Chrysene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
521	Benzo(b)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
522	Benzo(k)fluoranthene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
523	Benzo(a)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
524	Indeno(123-cd)pyrene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
525	Dibenz(a,h)anthracene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
526	Benzo(ghi)perylene	EPA 1311/8270A (Mod)	mg/L (extract)	All <	0.1	0.1	0.1	0.1	0.1	0.1	6	0.10000	0.00000	0.00000		0.00
527																
528																
529																
530	Dioxins/Furans (TCLP)															
531	2378-TCDD	EPA 8290	ng/L (extract)	All <	0.004	0.003	0.003	0.003	0.003	0.003	6	0.00317	0.00037	0.00017		11.77
532	12378-PeCDD	EPA 8290	ng/L (extract)	All <	0.009	0.006	0.007	0.007	0.007	0.007	6	0.00717	0.00090	0.00040		12.52
533	123478-HxCDD	EPA 8290	ng/L (extract)	All <	0.009	0.006	0.007	0.007	0.007	0.006	6	0.00700	0.00100	0.00045		14.29
534	123678-HxCDD	EPA 8290	ng/L (extract)	All <	0.007	0.005	0.006	0.006	0.006	0.006	6	0.00600	0.00058	0.00026		9.82
535	123789-HxCDD	EPA 8290	ng/L (extract)	All <	0.008	0.005	0.006	0.006	0.006	0.006	6	0.00617	0.00090	0.00040		14.55
536	1234678-HpCDD	EPA 8290	ng/L (extract)			0.005	0.007	0.008			3	0.00667	0.00125	0.00088		18.71
537	OCDD	EPA 8290	ng/L (extract)		0.027	0.036				0.028	3	0.03033	0.00403	0.00285		13.28
538																
539	2378-TCDF	EPA 8290	ng/L (extract)	All <	0.002	0.002	0.003	0.003	0.002	0.002	6	0.00233	0.00047	0.00021		20.20
540	12378-PeCDF	EPA 8290	ng/L (extract)	All <	0.006	0.003	0.004	0.004	0.004	0.004	6	0.00417	0.00090	0.00040		21.54
541	23478-PeCDF	EPA 8290	ng/L (extract)	All <	0.005	0.003	0.004	0.004	0.004	0.004	6	0.00400	0.00058	0.00026		14.43
542	123478-HxCDF	EPA 8290	ng/L (extract)		0.006			0.008		0.004	3	0.00533	0.00094	0.00067		17.68
543	123678-HxCDF	EPA 8290	ng/L (extract)	All <	0.004	0.002	0.004	0.004	0.003	0.002	6	0.00317	0.00090	0.00040		28.34
544	234678-HxCDF	EPA 8290	ng/L (extract)		0.004				0.004	0.006	3	0.00467	0.00094	0.00067		20.20
545	123789-HxCDF	EPA 8290	ng/L (extract)	All <	0.004	0.004	0.005	0.005	0.005	0.005	6	0.00467	0.00047	0.00021		10.10
546	1234678-HpCDF	EPA 8290	ng/L (extract)		0.009	0.011	0.01			0.007	4	0.00925	0.00148	0.00085		15.99
547	1234789-HpCDF	EPA 8290	ng/L (extract)	All <	0.008	0.005	0.007	0.007	0.006	0.006	6	0.00650	0.00096	0.00043		14.73
548	OCDF	EPA 8290	ng/L (extract)	All <	0.011	0.011	0.006	0.01	0.008	0.007	6	0.00883	0.00195	0.00087		22.08
549																
550	Totals: Dioxins															
551	-TCDD	EPA 8290	ng/L (extract)	All <	0.004	0.003	0.003	0.003	0.003	0.003	6	0.00317	0.00037	0.00017		11.77
552	-PeCDD	EPA 8290	ng/L (extract)	All <	0.009	0.006	0.007	0.007	0.007	0.007	6	0.00717	0.00090	0.00040		12.52
553	-HxCDD	EPA 8290	ng/L (extract)	All <	0.008	0.005	0.006	0.006	0.006	0.006	6	0.00617	0.00090	0.00040		14.55
554	-HpCDD	EPA 8290	ng/L (extract)			0.01	0.013	0.012			3	0.01167	0.00125	0.00088		10.69
555																
556	Totals: Furans															
557	-TCDF	EPA 8290	ng/L (extract)	All <	0.002	0.002	0.003	0.003	0.002	0.002	6	0.00233	0.00047	0.00021		20.20
558	-PeCDF	EPA 8290	ng/L (extract)	All <	0.005	0.003	0.004	0.004	0.004	0.004	6	0.00400	0.00058	0.00026		14.43
559	-HxCDF	EPA 8290	ng/L (extract)		0.02	0.011	0.005	0.015	0.004	0.011	6	0.01100	0.00551	0.00248		50.07
560	-HpCDF	EPA 8290	ng/L (extract)		0.009	0.011	0.01			0.007	4	0.00925	0.00148	0.00085		15.99
561																
562																
563	PCBs (TCLP)															
564																
565	PCBs:	EPA MM680/HRGC/MS	ug/L (extract)		0.025	0.0266	0.0277	0.0259	0.0234	0.0277	6	0.02603	0.00152	0.00069		5.82
566	2-Mono	Congenor #1	ug/L (extract)		0.0024	0.0042	0.0035	0.0038	0.0033	0.0033	6	0.00342	0.00055	0.00025		16.16
567	44'-DI	#15	ug/L (extract)		0.0029	0.0083	0.0058	0.007	0.0056	0.0055	6	0.00583	0.00165	0.00074		28.23
568	244'-Tri	#28	ug/L (extract)		0.0014	0.0051	0.0031	0.0035	0.0027	0.0026	6	0.00307	0.00111	0.00050		36.34
569	22'55'-Tetra	#52	ug/L (extract)				0.00023	0.0003	0.00024	0.0002	4	0.00024	0.00004	0.00002		14.99
570	33'44'-Tetra	#77	ug/L (extract)					0.00014	0.00011	0.0001	3	0.00012	0.00002	0.00001		14.57
571	2344'5-Penta	#118	ug/L (extract)		0.00025	0.0017	0.0012	0.0013	0.001	0.0009	6	0.00106	0.00044	0.00020		41.78
572	233'44'-Penta	#105	ug/L (extract)	All <	0.00008	0.00005	0.00006	0.00002	0.00002	0.00004	6	0.00004	0.00002	0.00001		40.20
573	33'44'5-Penta	#126	ug/L (extract)			0.00043	0.00035	0.00031	0.00023	0.00022	5	0.00031	0.00008	0.00004		25.35
574	233'44'5-Hexa	#156	ug/L (extract)	All <	0.00007	0.00007	0.00008	0.00003	0.00003	0.00005	6	0.00006	0.00002	0.00001		35.98
575	33'44'55'-Hexa	#169	ug/L (extract)		0.00031	0.0048	0.0016	0.002	0.0015	0.0014	6	0.00194	0.00138	0.00062		71.36
576	22'344'55'-Hepta	#180	ug/L (extract)			0.00059	0.00034	0.00038	0.00033	0.00029	5	0.00039	0.00011	0.00005		27.45
577	22'33'44'55'-Octa	#194	ug/L (extract)	All <	0.0001	0.00036	0.0002	0.00021	0.00019	0.00009	6	0.00019	0.00009	0.00004		46.41
578	22'33'44'56'6-Nona	#206	ug/L (extract)	All <	0.0001	0.00032	0.0002	0.00006	0.00008	0.0001	6	0.00014	0.00009	0.00004		66.50
579	Deca	#209														
580																
581	PCB Totals:				0.0333	0.0362	0.007	0.0352	0.0317	0.0364	6	0.00497	0.00188	0.00084		5.38
582	-Mono	EPA MM680/HRGC/MS	ug/L (extract)		0.0297	0.0403	0.0356	0.0384	0.0318	0.0356	6	0.03523	0.00361	0.00162		10.26
583	-DI	EPA MM680/HRGC/MS	ug/L (extract)		0.0204	0.0493	0.038	0.0415	0.035	0.0355	6	0.03662	0.00869	0.00389		23.74
584	-Tri	EPA MM680/HRGC/MS	ug/L (extract)		0.0081	0.0365	0.0235	0.0281	0.0218	0.0211	6	0.02352	0.00906	0.00405		38.51
585	-Tetra	EPA MM680/HRGC/MS	ug/L (extract)													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7	Analyte	Method	Units		#1	#2	#3	#4	#5	#6	n	Mean	SD	SEMEAN		CV (%)
586	-Penta	EPA MM680/HRGC/MS	ug/L (extract)		0.0037	0.0252	0.0173	0.0195	0.0148	0.0134	6	0.01562	0.00855	0.00293		41.97
587	-Hexa	EPA MM680/HRGC/MS	ug/L (extract)		0.0023	0.0208	0.0145	0.0145	0.0113	0.0104	6	0.01230	0.00558	0.00249		45.33
588	-Hepta	EPA MM680/HRGC/MS	ug/L (extract)		0.001	0.0108	0.0062	0.0074	0.0054	0.0053	6	0.00602	0.00291	0.00130		48.40
589	-Octa	EPA MM680/HRGC/MS	ug/L (extract)			0.0025	0.0014	0.0018	0.0013	0.00089	5	0.00150	0.00059	0.00029		39.11
590	-Nona	EPA MM680/HRGC/MS	ug/L (extract)	All <	0.0001	0.00054	0.0002	0.00021	0.00019	0.00009	6	0.00022	0.00015	0.00007		67.69
591																
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APPENDIX B

ORG-X ANALYTICAL RESULTS AND MASS BALANCE

A	B	C	D	E	F	G	H	I	J	K
						TABLE B-1				
					ORG-X PROCESS PERFORMANCE					
					Analytical Results - M&E/GRS End Product					
					(Air-dried solids after ORG-X solvent extract)					
Gross Physico-Chemical Properties					dry soil	dry soil				
		Raw Sediment	Raw Sediment	Comment					Amount	%
Analyte	Units	Comment	Mean	ORG-X	ME-01	ME-02	n	Mean	Change	Change
Particle size	% wt (dry)									
Medium gravel > 4.75 mm	% wt (dry)		0.04		0.000	0.000	2	0	0.04	100.00
Fine gravel 2-4.75	% wt (dry)		0.38		0.220	1.800	2	1.01	-0.63	-165.79
V. coarse sand 0.85-2	% wt (dry)		0.83		2.070	11.800	2	6.935	-6.105	-735.54
Coarse sand 0.425-0.85	% wt (dry)		2.15		26.600	14.100	2	20.35	-18.2	-846.51
Medium sand 0.24-0.425	% wt (dry)		5.05		13.600	11.400	2	12.5	-7.45	-147.52
Fine sand 0.106-0.24	% wt (dry)		9.57		15.100	13.700	2	14.4	-4.83	-50.47
V. fine sand 0.075-0.106	% wt (dry)		2.80		4.200	4.100	2	4.15	-1.35	-48.21
Clay	% wt (dry)		35.57		10.800	16.000	2	13.4	22.17	62.33
Silt	% wt (dry)		44.95		26.500	29.200	2	27.85	17.1	38.04
pH	pH units		7.90		7.100	6.820	2	6.96	0.94	11.90
Solids (total)	% wt (dry)		33.05		97.400	97.300	2	97.35	-64.3	-194.55
Sulfides (total)	mg/kg (dry)		7833.33		140.000	120.000	2	130	7703.33	98.34
Organic carbon (total)	% wt (dry)		7.32		6.130	6.060	2	6.095	1.225	16.73
Unconf Compression Strgth	psi		NA					NA		
Bulk Density	lbs/ft3		NA					NA		
Polychlorinated Biphenyls										
PCBs:	ug/kg (dry)									
2-Mono	ug/kg (dry)		57.33		4.000	3.700	2	3.85	53.48	93.28
44'-Di	ug/kg (dry)		64.67		28.800	29.000	2	28.80	35.87	55.47
244'-Tri	ug/kg (dry)		168.17	Reject	15.500	22.900	2	19.20	148.97	NC
22'55'-Tetra	ug/kg (dry)		269.33		22.500	20.200	2	21.35	247.98	92.07
33'44'-Tetra	ug/kg (dry)		13.83		4.200	4.400	2	4.30	9.53	68.91
2344'5-Penta	ug/kg (dry)		6.00	Reject	4.700	2.300	2	3.50	2.5	NC
233'44'-Penta	ug/kg (dry)		66.67		9.000	9.300	2	9.15	57.52	86.28
33'44'5-Penta	ug/kg (dry)		0.50		0.270	0.260	2	0.27	0.235	47.00
233'44'5-Hexa	ug/kg (dry)		17.12		1.600	1.800	2	1.60	15.52	90.65
33'44'55'-Hexa	ug/kg (dry)	All <	0.00	All <	0.030	0.030	2	0.03	-0.03	NC
22'344'55'-Hepta	ug/kg (dry)		73.37		9.300	9.400	2	9.35	64.02	87.26
22'33'44'55'-Octa	ug/kg (dry)		17.10		1.900	2.000	2	1.95	15.15	88.60
22'33'44'55'6-Nona	ug/kg (dry)		11.93		1.600	1.700	2	1.65	10.28	86.17
Deca	ug/kg (dry)		7.20		1.400	1.400	2	1.40	5.8	80.56
PCB Totals:										
-Mono	ug/kg (dry)		108.62		16.800	16.400	2	16.60	92.02	84.72
-Di	ug/kg (dry)		379.33		76.200	79.100	2	77.65	301.68	79.53
-Tri	ug/kg (dry)		727.83		104.000	111.000	2	107.50	620.33	85.23
-Tetra	ug/kg (dry)		1588.33		144.000	160.000	2	152.00	1436.33	90.43
-Penta	ug/kg (dry)		1236.67		104.000	114.000	2	109.00	1127.67	91.19
-Hexa	ug/kg (dry)		808.33		60.500	64.800	2	62.65	745.68	92.25
-Hepta	ug/kg (dry)		294.50		35.500	35.300	2	35.40	259.1	87.98
-Octa	ug/kg (dry)		95.83		8.600	9.100	2	8.85	86.98	90.76
-Nona	ug/kg (dry)		20.38		2.200	2.600	2	2.40	17.98	88.22

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6											
7	Gross Physico-Chemical Properties					dry soil	dry soil				
8			Raw	Raw							
9			Sediment	Sediment	Comment					Amount	%
10	Analyte	Units	Comment	Mean	ORG-X	ME-01	ME-02	n	Mean	Change	Change
72	Chlorinated Pesticides and Herbicides										
73											
74											
75	Pesticides (Cl):										
76	a-BHC	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
77	a-Chlordane	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
78	Aldrin	ug/kg (dry)		75.02	All <	1.770	1.770	2	1.77	73.25	>97.64
79	beta-BHC	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
80	delta-BHC	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
81	4,4'-DDD	ug/kg (dry)		162.10		3.530	14.820	2	9.18	152.925	94.34
82	4,4'-DDE	ug/kg (dry)		150.57	All <	3.530	3.550	2	3.54	147.03	>97.65
83	4,4'-DDT	ug/kg (dry)	All <	28.90	All <	3.530	3.550	2	3.54	25.36	NC
84	Dieldrin	ug/kg (dry)		74.45	All <	3.530	3.550	2	3.54	70.91	>95.25
85	Endrin	ug/kg (dry)	All <	28.90	All <	3.530	3.550	2	3.54	25.36	NC
86	Endrin aldehyde	ug/kg (dry)	All <	28.90	All <	3.530	3.550	2	3.54	25.36	NC
87	Endosulfan I	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
88	Endosulfan II	ug/kg (dry)	All <	28.90	All <	3.530	3.550	2	3.54	25.36	NC
89	Endosulfan sulfate	ug/kg (dry)	All <	28.90	All <	3.530	3.550	2	3.54	25.36	NC
90	g-BHC (Lindane)	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
91	g-Chlordane	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
92	Heptachlor	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
93	Heptachlor epoxide	ug/kg (dry)	All <	14.47	All <	1.770	1.770	2	1.77	12.7	NC
94	Methoxychlor	ug/kg (dry)	All <	144.53	All <	17.660	17.740	2	17.70	126.83	NC
95	Toxaphene	ug/kg (dry)	All <	1445.15	All <	176.590	177.380	2	176.99	1268.165	NC
96											
97											
98	Chlorinated Herbicides										
99	2,4-D	mg/kg (dry)	All <	0.20	All <	0.200	0.200	2	0.20	0	0.00
100	2,4,5-TP (Silvex)	mg/kg (dry)	All <	0.05	All <	0.050	0.050	2	0.05	0	0.00
101	2,4,5-T	mg/kg (dry)	All <	0.05	All <	0.050	0.050	2	0.05	0	0.00
102											
103											
104											
105											
106											
107											
108	Semivolatile Compounds (incl										
109	Phenol	ug/kg (dry)		638.00		151.090	201.800	2	176.45	461.555	72.34
110	bis(2-Chloroethyl)ether	ug/kg (dry)	All <	754.50	All <	128.000	144.000	2	136.00	618.5	NC
111	2-Chlorophenol	ug/kg (dry)	All <	691.67	All <	138.000	155.000	2	146.50	545.17	NC
112	1,3-Dichlorobenzene	ug/kg (dry)	All <	507.33	All <	132.000	149.000	2	140.50	366.83	NC
113	1,4-Dichlorobenzene	ug/kg (dry)	All <	517.00		56.400	56.900	2	56.65	460.35	<89.04
114	1,2-Dichlorobenzene	ug/kg (dry)	All <	573.67		48.100	68.700	2	58.40	515.27	<89.82
115	Benzyl alcohol	ug/kg (dry)	All <	1378.33	All <	321.000	361.000	2	341.00	1037.33	NC
116	2,2'-oxybis(1-Chloropropane)	ug/kg (dry)	All <	864.17	All <	112.000	126.000	2	119.00	745.17	NC
117	2-Methylphenol	ug/kg (dry)	All <	875.60	All <	139.000	157.000	2	148.00	727.6	NC
118	3/4-Methylphenol	ug/kg (dry)		1389.67		245.000	262.000	2	253.50	1136.17	81.76
119	N-Nitroso-di-n-propylamine	ug/kg (dry)		1091.50	All <	189.000	212.000	2	200.50	891	>81.63
120	Hexachloroethane	ug/kg (dry)	All <	1243.83	All <	181.000	203.000	2	192.00	1051.83	NC
121	Nitrobenzene	ug/kg (dry)	All <	570.83	All <	98.000	112.000	2	105.00	465.83	NC
122	Isophorone	ug/kg (dry)	All <	334.33	All <	59.000	67.000	2	63.00	271.33	NC
123	2-Nitrophenol	ug/kg (dry)	All <	1054.67	All <	247.000	283.000	2	265.00	789.67	NC
124	2,4-Dimethylphenol	ug/kg (dry)	All <	717.17	All <	111.000	127.000	2	119.00	598.17	NC
125	bis(2-Chloroethoxy)methane	ug/kg (dry)	All <	631.83	All <	99.000	113.000	2	106.00	525.83	NC
126	Benzoic acid	ug/kg (dry)	All <	1335.17		4214.000	3417.000	2	3815.50	-2480.33	-185.77
127	2,4-Dichlorophenol	ug/kg (dry)	All <	684.33	All <	151.000	173.000	2	162.00	522.33	NC
128	1,2,4-Trichlorobenzene	ug/kg (dry)	All <	623.17		222.000	197.000	2	209.50	413.67	<66.38
129	Naphthalene	ug/kg (dry)		2726.67		756.000	753.000	2	754.50	1972.17	72.33
130	4-Chloroaniline	ug/kg (dry)		1002.83	All <	113.000	130.000	2	121.50	881.33	>87.88
131	Hexachlorobutadiene	ug/kg (dry)	All <	711.33	All <	149.000	170.000	2	159.50	551.83	NC
132	4-Chloro-3-methylphenol	ug/kg (dry)	All <	839.17	All <	120.000	138.000	2	129.00	710.17	NC
133	2-Methylnaphthalene	ug/kg (dry)		2304.00		517.000	465.000	2	491.00	1813	78.69
134	Hexachlorocyclopentadiene	ug/kg (dry)	All <	668.33	All <	183.000	208.000	2	195.50	472.83	NC
135	2,4,6-Trichlorophenol	ug/kg (dry)	All <	843.17	All <	203.000	231.000	2	217.00	626.17	NC
136	2,4,5-Trichlorophenol	ug/kg (dry)	All <	798.00	All <	188.000	214.000	2	201.00	597	NC
137	2-Chloronaphthalene	ug/kg (dry)	All <	369.67	All <	76.000	86.000	2	81.00	288.67	NC
138	2-Nitroaniline	ug/kg (dry)	All <	1092.17	All <	178.000	203.000	2	190.50	901.67	NC
139	Dimethylphthalate	ug/kg (dry)	All <	312.17	All <	62.000	71.000	2	66.50	245.67	NC
140	2,6-Dinitrotoluene	ug/kg (dry)	All <	1388.00	All <	276.000	314.000	2	295.00	1093	NC
141	2,4-Dinitrotoluene	ug/kg (dry)	All <	1011.83	All <	206.000	234.000	2	220.00	791.83	NC

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10	Analyte	Units	Comment	Mean	ORG-X	ME-01	ME-02	n	Mean	Change	Change
142	Acenapthylene	ug/kg (dry)		1288.50		123.000	115.000	2	119.00	1169.5	90.76
143	3-Nitroaniline	ug/kg (dry)	All <	1350.53	All <	273.000	310.000	2	291.50	1059.03	NC
144	Acenaphthene	ug/kg (dry)		1042.33		134.000	77.000	2	105.50	936.83	89.88
145	2,4-Dinitrophenol	ug/kg (dry)	All <	2467.33	All <	578.000	657.000	2	617.50	1849.83	NC
146	4-Nitrophenol	ug/kg (dry)	All <	1618.17		274.000	312.000	2	293.00	1325.17	<81.89
147	Dibenzofuran	ug/kg (dry)		1172.00		400.000	376.000	2	388.00	784	NC
148	Diethylphthalate	ug/kg (dry)	All <	276.17	All <	54.000	152.000	2	103.00	173.17	NC
149	4-Chlorophenyl-phenylether	ug/kg (dry)	All <	540.33	All <	140.000	159.000	2	149.50	390.83	NC
150	Fluorene	ug/kg (dry)		1369.17		355.000	319.000	2	337.00	1032.17	75.39
151	4-Nitroaniline	ug/kg (dry)	All <	1319.00	All <	284.000	323.000	2	303.50	1015.5	NC
152	4,6-Dinitro-2-methylphenol	ug/kg (dry)	All <	1731.33	All <	396.000	534.000	2	465.00	1266.33	NC
153	N-Nitrosodiphenylamine	ug/kg (dry)	All <	566.50	All <	124.000	167.000	2	145.50	421	NC
154	4-Bromophenyl-phenylether	ug/kg (dry)	All <	1016.17	All <	271.000	365.000	2	318.00	698.17	NC
155	Hexachlorobenzene	ug/kg (dry)	All <	779.00	All <	205.000	276.000	2	240.50	538.5	NC
156	Pentachlorophenol	ug/kg (dry)	All <	1038.83	All <	298.000	402.000	2	350.00	688.83	NC
157	Phenanthrene	ug/kg (dry)		6586.00		2340.000	2358.000	2	2349.00	4237	64.33
158	Anthracene	ug/kg (dry)		3702.17		1116.000	1082.000	2	1099.00	2603.17	70.31
159	Di-n-butyl phthalate	ug/kg (dry)		1226.60		264.000	261.000	2	262.50	964.1	78.60
160	Fluoranthene	ug/kg (dry)		10323.67		2472.000	2526.000	2	2499.00	7824.67	75.79
161	Pyrene	ug/kg (dry)		7101.67		3774.000	3425.000	2	3599.50	3502.17	49.31
162	Butylbenzylphthalate	ug/kg (dry)		1473.17		174.000	122.000	2	148.00	1325.17	89.95
163	3,3'-Dichlorobenzidine	ug/kg (dry)	All <	287.67	All <	126.000	138.000	2	132.00	155.67	NC
164	bis-2-ethylhexylphthalate	ug/kg (dry)		48630.83		5722.000	6042.000	2	5882.00	42748.83	87.90
165	Benzo(a)anthracene	ug/kg (dry)		4484.17		1273.000	1360.000	2	1316.50	3167.67	70.64
166	Chrysene	ug/kg (dry)		4584.33		1972.000	1802.000	2	1887.00	2697.33	58.84
167	Di-n-octylphthalate	ug/kg (dry)	Rejected		All <	85.000	31.000	2	58.00	-58	NC
168	Benzo(b)fluoranthene	ug/kg (dry)		2922.17		1444.000	1651.000	2	1547.50	1374.67	47.04
169	Benzo(k)fluoranthene	ug/kg (dry)		1107.33		570.000	487.000	2	528.50	578.83	52.27
170	Benzo(a)pyrene	ug/kg (dry)		2550.83		897.000	876.000	2	886.50	1664.33	65.25
171	Indeno(123-cd)pyrene	ug/kg (dry)		1075.67		387.000	378.000	2	382.50	693.17	64.44
172	Dibenz(a,h)anthracene	ug/kg (dry)		397.00		189.000		1	189.00	208	52.39
173	Benzo(ghi)perylene	ug/kg (dry)		1254.33		370.000	313.000	2	341.50	912.83	72.77
174	Benzo(e)pyrene	ug/kg (dry)		2125.50		701.000	767.000	2	734.00	1391.5	65.47
175	Perylene	ug/kg (dry)		948.50		539.000	450.000	2	494.50	454	47.87
176											
177											
178											
179											
180											
181	Dioxins and Furans										
182	2378-TCDD	ng/kg (dry)		41.52		21.000	19.000	2	20.00	21.52	51.83
183	12378-PeCDD	ng/kg (dry)		60.15		46.000	34.300	2	40.15	20	33.25
184	123478-HxCDD	ng/kg (dry)		49.22		52.100	37.400	2	44.75	4.47	9.08
185	123678-HxCDD	ng/kg (dry)		141.67		79.600	62.600	2	71.10	70.57	49.81
186	123789-HxCDD	ng/kg (dry)		133.60		123.000	94.900	2	108.95	24.65	18.45
187	1234678-HpCDD	ng/kg (dry)		2091.67		789.000	693.000	2	741.00	1350.67	64.57
188	OCDD	ng/kg (dry)		17463.33		5880.000	5560.000	2	5720.00	11743.33	67.25
189											
190	2378-TCDF	ng/kg (dry)		340.00		883.000	707.000	2	795.00	-455	-133.82
191	12378-PeCDF	ng/kg (dry)		310.83		225.000	176.000	2	200.50	110.33	35.50
192	23478-PeCDF	ng/kg (dry)		146.40		393.000	267.000	2	330.00	-183.6	-125.41
193	123478-HxCDF	ng/kg (dry)		1303.33		1800.000	1510.000	2	1655.00	-351.67	-26.98
194	123678-HxCDF	ng/kg (dry)		464.00		400.000	334.000	2	367.00	97	20.91
195	234678-HxCDF	ng/kg (dry)		186.00		497.000	405.000	2	451.00	-265	-142.47
196	123789-HxCDF	ng/kg (dry)		23.23	All <	17.600	13.000	2	15.30	7.93	>34.14
197	1234678-HpCDF	ng/kg (dry)		4966.33		3080.000	2930.000	2	3005.00	1961.33	39.49
198	1234789-HpCDF	ng/kg (dry)		110.52		108.000	90.000	2	99.00	11.52	10.42
199	OCDF	ng/kg (dry)		4418.33		2010.000	2270.000	2	2140.00	2278.33	51.57
200											
201	Totals: Dioxins										
202	-TCDD	ng/kg (dry)		246.10		376.000	290.000	2	333.00	-86.9	-35.31
203	-PeCDD	ng/kg (dry)		378.17		620.000	476.000	2	548.00	-169.83	-44.91
204	-HxCDD	ng/kg (dry)		1370.00		900.000	725.000	2	812.50	557.5	40.69
205	-HpCDD	ng/kg (dry)		4450.00		1590.000	1450.000	2	1520.00	2930	65.84
206											
207	Totals: Furans										
208	-TCDF	ng/kg (dry)		2371.67		4780.000	3780.000	2	4280.00	-1908.33	-80.46
209	-PeCDF	ng/kg (dry)		2853.33		4740.000	3630.000	2	4185.00	-1331.67	-46.67
210	-HxCDF	ng/kg (dry)		5175.00		5220.000	4610.000	2	4915.00	260	5.02
211	-HpCDF	ng/kg (dry)		6068.33		3760.000	3550.000	2	3655.00	2413.33	39.77

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212											
213											
214											
215											
216											
217	Metals										
218	Ag	mg/kg (dry)		18.42					NA	NC	NC
219	As	mg/kg (dry)		33.48					NA	NC	NC
220	Be	mg/kg (dry)	All <	0.56	All <	0.192	0.184	2	0.19	0.372	NC
221	Cd	mg/kg (dry)		37.05		36.000	36.500	2	36.25	0.8	2.16
222	Cr	mg/kg (dry)		376.67		384.000	386.000	2	385.00	-8.33	-2.21
223	Cu	mg/kg (dry)		1171.67		1160.000	1200.000	2	1180.00	-8.33	-0.71
224	Ni	mg/kg (dry)		297.17		290.000	289.000	2	289.50	7.67	2.58
225	Pb	mg/kg (dry)		617.00		624.000	632.000	2	628.00	-11	-1.78
226	Sb	mg/kg (dry)		10.29		8.410	6.960	2	7.69	2.605	25.32
227	Se	mg/kg (dry)		3.24		2.760	2.680	2	2.72	0.52	16.05
228	Tl	mg/kg (dry)	All <	2.77		1.780	1.920	2	1.85	0.92	<33.21
229	Zn	mg/kg (dry)		1725.00		1690.000	1720.000	2	1705.00	20	1.16
230	Hg (Total)	mg/kg (dry)		1.29		2.870	3.240	2	3.08	-1.765	-136.82
231											
232											
233											
234											
235											

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236											
237	Metals (TCLP)										
238	-Arsenic	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
239	-Barium	mg/L (extract)	All <	0.50000		0.500	0.500	2	0.50000	0	<0
240	-Cadmium	mg/L (extract)	All <	0.01000	?? - check	0.540	0.510	2	0.52500	-0.515	<-5150
241	-Chromium	mg/L (extract)		0.02833	?? - check	0.050	0.050	2	0.05000	-0.02167	-76.49
242	-Lead	mg/L (extract)	All <	0.05000		0.100	0.090	2	0.09500	-0.045	<-90
243	-Mercury	mg/L (extract)	All <	0.00100		0.001	0.001	2	0.00100	0	<0
244	-Selenium	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
245	-Silver	mg/L (extract)	All <	0.01000		0.010	0.010	2	0.01000	0	<0
246											
247	Organo-Cl Pesticides (TCLP)										
248	-Chlordane	mg/L (extract)	All <	0.00500	All <	0.005	0.005	2	0.00500	0	NC
249	-Endrin	mg/L (extract)	All <	0.00050	All <	0.001	0.001	2	0.00050	0	NC
250	-Heptachlor	mg/L (extract)	All <	0.00050	All <	0.001	0.001	2	0.00050	0	NC
251	-Heptachlor epoxide	mg/L (extract)	All <	0.00050	All <	0.001	0.001	2	0.00050	0	NC
252	-Lindane (g-BHC)	mg/L (extract)	All <	0.00050	All <	0.001	0.001	2	0.00050	0	NC
253	-Methoxychlor	mg/L (extract)	All <	0.00100	All <	0.001	0.001	2	0.00100	0	NC
254	-Toxaphene	mg/L (extract)	All <	0.01000	All <	0.010	0.010	2	0.01000	0	NC
255											
256	Cl Herbicides (TCLP)										
257	-2,4-D	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
258	-2,4,5-TP (Silvex)	mg/L (extract)	All <	0.01000	All <	0.010	0.010	2	0.01000	0	NC
259											
260	Volatilve Organics (TCLP)										
261	-Benzene	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
262	-Carbon tetrachloride	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
263	-Chlorobenzene	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
264	-Chloroform	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
265	-1,4-Dichlorobenzene	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
266	-1,2-Dichloroethane	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
267	-1,1-Dichloroethene	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
268	Methyl ethyl ketone	mg/L (extract)	All <	5.00000	All <	5.000	5.000	2	5.00000	0	NC
269	Tetrachloroethene	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
270	Trichloroethene	mg/L (extract)	All <	0.20000	All <	0.200	0.200	2	0.20000	0	NC
271	Vinyl chloride	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
272											
273	Semi-Volatiles (TCLP)										
274	-Hexachloroethane	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
275	-Nitrobenzene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
276	-Hexachlorobutadiene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
277	-2,4-Dinitrotoluene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
278	-Hexachlorobenzene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
279	-2,4,6-Trichlorophenol	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
280	-2,4,5-Trichlorophenol	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
281	-Pentachlorophenol	mg/L (extract)	All <	0.25000	All <	0.250	0.250	2	0.25000	0	NC
282	-Pyridine	mg/L (extract)	All <	0.25000	All <	0.250	0.250	2	0.25000	0	NC
283	-o-Cresol	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
284	-m,p-Cresols	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
285	-Total Cresols	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC

A	A	B	C	D	E	F	G	H	I	J	K
1							TABLE B-1				
2						ORG-X PROCESS PERFORMANCE					
3											
4						Analytical Results - M&E/GRS End Product					
5						(Air-dried solids after ORG-X solvent extract)					
6											
7	Gross Physico-Chemical Properties					dry soil	dry soil				
8			Raw	Raw							
9			Sediment	Sediment	Comment					Amount	%
10	Analyte	Units	Comment	Mean	ORG-X	ME-01	ME-02	n	Mean	Change	Change
286											
287	PAHs (TCLP)										
288	Naphthalene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
289	2-Methylnaphthalene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
290	Acenapthylene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
291	Acenaphthene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
292	Dibenzofuran	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
293	Fluorene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
294	Phenanthrene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
295	Anthracene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
296	Fluoranthene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
297	Pyrene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
298	Benzo(a)anthracene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
299	Chrysene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
300	Benzo(b)fluoranthene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
301	Benzo(k)fluoranthene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
302	Benzo(a)pyrene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
303	Indeno(123-cd)pyrene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
304	Dibenz(a,h)anthracene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
305	Benzo(ghi)perylene	mg/L (extract)	All <	0.10000	All <	0.100	0.100	2	0.10000	0	NC
306											
307	Dioxins/Furans (TCLP)										
308	2378-TCDD	ng/L (extract)	All <	0.00317	All <	0.003	0.001	2	0.00175	0.00142	NC
309	12378-PeCDD	ng/L (extract)	All <	0.00717	All <	0.006	0.001	2	0.00325	0.00392	NC
310	123478-HxCDD	ng/L (extract)	All <	0.00700	All <	0.005	0.001	2	0.00310	0.0039	NC
311	123678-HxCDD	ng/L (extract)	All <	0.00600	All <	0.004	0.000	2	0.00218	0.003825	NC
312	123789-HxCDD	ng/L (extract)	All <	0.00617	All <	0.005	0.001	2	0.00290	0.00327	NC
313	1234678-HpCDD	ng/L (extract)		0.00867	Reject	0.003	0.002	2	0.00240	0.00627	NC
314	OCDD	ng/L (extract)		0.03033	Reject	0.008	0.008	2	0.00795	0.02238	NC
315											
316	2378-TCDF	ng/L (extract)	All <	0.00233	All <	0.004	0.000	2	0.00231	0.000025	NC
317	12378-PeCDF	ng/L (extract)	All <	0.00417	All <	0.006	0.001	2	0.00336	0.000815	NC
318	23478-PeCDF	ng/L (extract)	All <	0.00400	All <	0.006	0.001	2	0.00317	0.000835	NC
319	123478-HxCDF	ng/L (extract)		0.00533	Reject	0.005	0.002	2	0.00350	0.00183	NC
320	123678-HxCDF	ng/L (extract)	All <	0.00317	Reject	0.005	0.001	2	0.00259	0.000585	NC
321	234678-HxCDF	ng/L (extract)		0.00467	Reject	0.007	0.004	2	0.00535	-0.00068	NC
322	123789-HxCDF	ng/L (extract)	All <	0.00467	All <	0.006	0.001	2	0.00310	0.00157	NC
323	1234678-HpCDF	ng/L (extract)		0.00925	Reject	0.004	0.002	2	0.00325	0.006	NC
324	1234789-HpCDF	ng/L (extract)	All <	0.00650	All <	0.004	0.001	2	0.00240	0.0041	NC
325	OCDF	ng/L (extract)	All <	0.00883	Reject	0.007	0.002	2	0.00440	0.00443	NC
326											
327	Totals: Dioxins										
328	-TCDD	ng/L (extract)	All <	0.00317	All <	0.005	0.002	2	0.00335	-0.00018	NC
329	-PeCDD	ng/L (extract)	All <	0.00717	All <	0.006	0.001	2	0.00325	0.00392	NC
330	-HxCDD	ng/L (extract)	All <	0.00617	All <	0.014	0.004	2	0.00915	-0.00298	NC
331	-HpCDD	ng/L (extract)		0.01167		0.003	0.002	2	0.00240	0.00927	79.43
332											
333	Totals: Furans										
334	-TCDF	ng/L (extract)	All <	0.00233	All <	0.004	0.000	2	0.00230	0.00003	NC
335	-PeCDF	ng/L (extract)	All <	0.00400	?? - check	0.012	0.001	2	0.00655	-0.00255	<-63.75
336	-HxCDF	ng/L (extract)		0.01100	?? - check	0.022	0.008	2	0.01525	-0.00425	-38.64
337	-HpCDF	ng/L (extract)		0.00925	All <	0.009	0.003	2	0.00560	0.00365	<39.46
338											
339											

A	A	B	C	D	E	F	G	H	I	J	K
1							TABLE B-1				
2						ORG-X PROCESS PERFORMANCE					
3											
4						Analytical Results - M&E/GRS End Product					
5						(Air-dried solids after ORG-X solvent extract)					
6											
7	Gross Physico-Chemical Properties					dry soil	dry soil				
8			Raw	Raw							
9			Sediment	Sediment	Comment					Amount	%
10	Analyte	Units	Comment	Mean	ORG-X	ME-01	ME-02	n	Mean	Change	Change
340	PCBs (TCLP)										
341											
342	PCBs:	ug/L (extract)									
343	2-Mono	ug/L (extract)		0.02603		0.002	0.002	2	0.00180	0.02423	93.08
344	44'-Di	ug/L (extract)		0.00342		0.001	0.001	2	0.00077	0.00265	77.49
345	244'-Tri	ug/L (extract)		0.00583	All <	0.000	0.000	2	0.00034	0.005495	>94.25
346	22'55'-Tetra	ug/L (extract)		0.00307	All <	0.000	0.000	2	0.00022	0.002855	>93.00
347	33'44'-Tetra	ug/L (extract)		0.00024	All <	0.000	0.000	2	0.00005	0.000195	>81.25
348	2344'5-Penta	ug/L (extract)		0.00012	All <	0.000	0.000	2	0.00007	0.000055	>45.83
349	233'44'-Penta	ug/L (extract)		0.00106	All <	0.000	0.000	2	0.00007	0.000995	>93.87
350	33'44'5-Penta	ug/L (extract)	All <	0.00004	All <	0.000	0.000	2	0.00007	-2.5E-05	NC
351	233'44'5-Hexa	ug/L (extract)		0.00031	All <	0.000	0.000	2	0.00006	0.00025	>80.65
352	33'44'55'-Hexa	ug/L (extract)	All <	0.00006	All <	0.000	0.000	2	0.00007	-1.0E-05	NC
353	22'344'55'-Hepta	ug/L (extract)		0.00194	All <	0.000	0.000	2	0.00009	0.001855	>95.62
354	22'33'44'55'-Octa	ug/L (extract)		0.00039	All <	0.000	0.000	2	0.00015	0.00024	>61.54
355	22'33'44'55'6-Nona	ug/L (extract)	All <	0.00019	All <	0.000	0.000	2	0.00015	0.00004	NC
356	Deca	ug/L (extract)	All <	0.00014	All <	0.000	0.000	2	0.00009	0.00005	NC
357											
358	PCB Totals:										
359	-Mono	ug/L (extract)		0.03497		0.002	0.003	2	0.00280	0.03217	91.99
360	-Di	ug/L (extract)		0.03523		0.004	0.004	2	0.00385	0.03138	89.07
361	-Tri	ug/L (extract)		0.03662		0.001	0.003	2	0.00205	0.03457	94.40
362	-Tetra	ug/L (extract)		0.02352		0.001	0.001	2	0.00078	0.022765	96.79
363	-Penta	ug/L (extract)		0.01562		0.000	0.000	2	0.00022	0.015405	98.62
364	-Hexa	ug/L (extract)		0.01230	All <	0.000	0.000	2	0.00008	0.012225	>99.39
365	-Hepta	ug/L (extract)		0.00602	All <	0.000	0.000	2	0.00007	0.00595	>98.84
366	-Octa	ug/L (extract)		0.00150	All <	0.000	0.000	2	0.00015	0.00135	>90.00
367	-Nona	ug/L (extract)	All <	0.00022	All <	0.000	0.000	2	0.00015	0.00007	NC
368											
369											
370	NA = Not Applicable or Available										
371	NC = Cannot be calculated because : 1) two values are inequalities , or 2) at least one value is rejected or not available.										

A	A	B	C	D	E
1		**TABLE B-2**			
2		**CONTAMINATED SOLVENT ANALYSES**			
3					
4	Gross Physico-Chemical Properties		solvent	contam.	duplicate
5			comment	solvent	
6					
7	Analyte	Units		ME-24	ME-24D
9	Chlorinated Pesticides and Herbicides				
10					
11					
12	Pesticides (Cl):				
13	a-BHC	ug/g		<4.95	
14	a-Chlordane	ug/g		<4.95	
15	Aldrin	ug/g		<4.95	
16	beta-BHC	ug/g		<4.95	
17	delta-BHC	ug/g		<4.95	
18	4,4'-DDD	ug/g		<9.90	
19	4,4'-DDE	ug/g		<9.90	
20	4,4'-DDT	ug/g		<9.90	
21	Dieldrin	ug/g		<9.90	
22	Endrin	ug/g		<9.90	
23	Endrin aldehyde	ug/g		<9.90	
24	Endosulfan I	ug/g		<4.95	
25	Endosulfan II	ug/g		<9.90	
26	Endosulfan sulfate	ug/g		<9.90	
27	g-BHC (Lindane)	ug/g		<4.95	
28	g-Chlordane	ug/g		<4.95	
29	Heptachlor	ug/g		<4.95	
30	Heptachlor epoxide	ug/g		<4.95	
31	Methoxychlor	ug/g		<49.51	
32	Toxaphene	ug/g		<495.05	
33					
34					
35	Chlorinated Herbicides				
36	2,4-D	mg/kg (dry)		<6	
37	2,4,5-TP (Silvex)	mg/kg (dry)		<2	
38	2,4,5-T	mg/kg (dry)		<2	
39					
40					
41					
42					

A	A	B	C	D	E
1		**TABLE B-2**			
2		**CONTAMINATED SOLVENT ANALYSES**			
3					
4	Gross Physico-Chemical Properties		solvent	contam.	duplicate
5			comment	solvent	
6					
7	Analyte	Units		ME-24	ME-24D
43	Semivolatile Compounds (incl				
44	Phenol	ug/g		1.11	
45	bis(2-Chloroethyl)ether	ug/g		<0.87	
46	2-Chlorophenol	ug/g		<0.72	
47	1,3-Dichlorobenzene	ug/g		<0.66	
48	1,4-Dichlorobenzene	ug/g		0.30	
49	1,2-Dichlorobenzene	ug/g		6.00	
50	Benzyl alcohol	ug/g		<2.01	
51	2,2'-oxybis(1-Chloropropane)	ug/g		<0.96	
52	2-Methylphenol	ug/g		<1.00	
53	3/4-Methylphenol	ug/g		<1.02	
54	N-Nitroso-di-n-propylamine	ug/g		<1.24	
55	Hexachloroethane	ug/g		<1.30	
56	Nitrobenzene	ug/g		<0.69	
57	Isophorone	ug/g		1.76	
58	2-Nitrophenol	ug/g		<`1.28	
59	2,4-Dimethylphenol	ug/g		<0.92	
60	bis(2-Chloroethoxy)methane	ug/g		<.70	
61	Benzoic acid	ug/g		<1.60	
62	2,4-Dichlorophenol	ug/g		<1.10	
63	1,2,4-Trichlorobenzene	ug/g		<0.87	
64	Naphthalene	ug/g		3.12	
65	4-Chloroaniline	ug/g		0.68	
66	Hexachlorobutadiene	ug/g		<1.26	
67	4-Chloro-3-methylphenol	ug/g		<1.23	
68	2-Methylnaphthalene	ug/g		0.63	
69	Hexachlorocyclopentadiene	ug/g		<1.24	
70	2,4,6-Trichlorophenol	ug/g		<1.63	
71	2,4,5-Trichlorophenol	ug/g		<1.61	
72	2-Chloronaphthalene	ug/g		<0.48	
73	2-Nitroaniline	ug/g		<1.76	
74	Dimethylphthalate	ug/g		<0.49	
75	2,6-Dinitrotoluene	ug/g		<2.08	
76	2,4-Dinitrotoluene	ug/g		<1.52	
77	Acenapthylene	ug/g		0.59	
78	3-Nitroaniline	ug/g		<`1.72	
79	Acenaphthene	ug/g		0.74	
80	2,4-Dinitrophenol	ug/g		<5.00	
81	4-Nitrophenol	ug/g		<2.71	
82	Dibenzofuran	ug/g		<0.32	
83	Diethylphthalate	ug/g		<0.40	

A	A	B	C	D	E
1		**TABLE B-2**			
2		**CONTAMINATED SOLVENT ANALYSES**			
3					
4	Gross Physico-Chemical Properties		solvent	contam.	duplicate
5			comment	solvent	
6					
7	Analyte	Units		ME-24	ME-24D
84	4-Chlorophenyl-phenylether	ug/g		<1.05	
85	Fluorene	ug/g		0.80	
86	4-Nitroaniline	ug/g		<1.77	
87	4,6-Dinitro-2-methylphenol	ug/g		<2.76	
88	N-Nitrosodiphenylamine	ug/g		<0.75	
89	4-Bromophenyl-phenylether	ug/g		<1.60	
90	Hexachlorobenzene	ug/g		<1.35	
91	Pentachlorophenol	ug/g		<2.36	
92	Phenanthrene	ug/g		2.56	
93	Anthracene	ug/g		1.76	
94	Di-n-butyl phthalate	ug/g		0.67	
95	Fluoranthene	ug/g		5.67	
96	Pyrene	ug/g		4.38	
97	Butylbenzylphthalate	ug/g		0.66	
98	3,3'-Dichlorobenzidine	ug/g		<0.79	
99	bis-2-ethylhexylphthalate	ug/g		39.77	
100	Benzo(a)anthracene	ug/g		2.38	
101	Chrysene	ug/g		2.58	
102	Di-n-octylphthalate	ug/g		0.75	
103	Benzo(b)fluoranthene	ug/g		1.71	
104	Benzo(k)fluoranthene	ug/g		0.64	
105	Benzo(a)pyrene	ug/g		1.38	
106	Indeno(123-cd)pyrene	ug/g		0.83	
107	Dibenz(a,h)anthracene	ug/g		0.43	
108	Benzo(ghi)perylene	ug/g		1.02	
109	Benzo(e)pyrene	ug/g		1.21	
110	Perylene	ug/g		0.22	
111	Indeno(1,2,3,-cd)pyrene	ug/g		0.83	
112	Dibenz(a,h)anthracene	ug/g		0.43	
113	Benzo(g,h,i)perylene	ug/g		1.02	
114					
115					

A	A	B	C	D	E
1		**TABLE B-2**			
2		**CONTAMINATED SOLVENT ANALYSES**			
3					
4	Gross Physico-Chemical Properties		solvent	contam.	duplicate
5			comment	solvent	
6					
7	Analyte	Units		ME-24	ME-24D
116	Dioxins and Furans				
117	2378-TCDD	ng/kg (dry)		8.0	
118	12378-PeCDD	ng/kg (dry)		9.8	
119	123478-HxCDD	ng/kg (dry)		10.2	
120	123678-HxCDD	ng/kg (dry)		30.1	
121	123789-HxCDD	ng/kg (dry)		**<22.0**	
122	1234678-HpCDD	ng/kg (dry)		499	
123	OCDD	ng/kg (dry)		3710	
124					
125	2378-TCDF	ng/kg (dry)		75.4	
126	12378-PeCDF	ng/kg (dry)		66.3	
127	23478-PeCDF	ng/kg (dry)		34	
128	123478-HxCDF	ng/kg (dry)		298	
129	123678-HxCDF	ng/kg (dry)		110	
130	234678-HxCDF	ng/kg (dry)		31.5	
131	123789-HxCDF	ng/kg (dry)		<1.20	
132	1234678-HpCDF	ng/kg (dry)		1170	
133	1234789-HpCDF	ng/kg (dry)		25.3	
134	OCDF	ng/kg (dry)		1010	
135					
136	Totals: Dioxins				
137	-TCDD	ng/kg (dry)		66.8	
138	-PeCDD	ng/kg (dry)		93.9	
139	-HxCDD	ng/kg (dry)		275	
140	-HpCDD	ng/kg (dry)		1070	
141					
142	Totals: Furans				
143	-TCDF	ng/kg (dry)		660	
144	-PeCDF	ng/kg (dry)		752	
145	-HxCDF	ng/kg (dry)		1100	
146	-HpCDF	ng/kg (dry)		1430	
147					
148					
149					
150					
151					

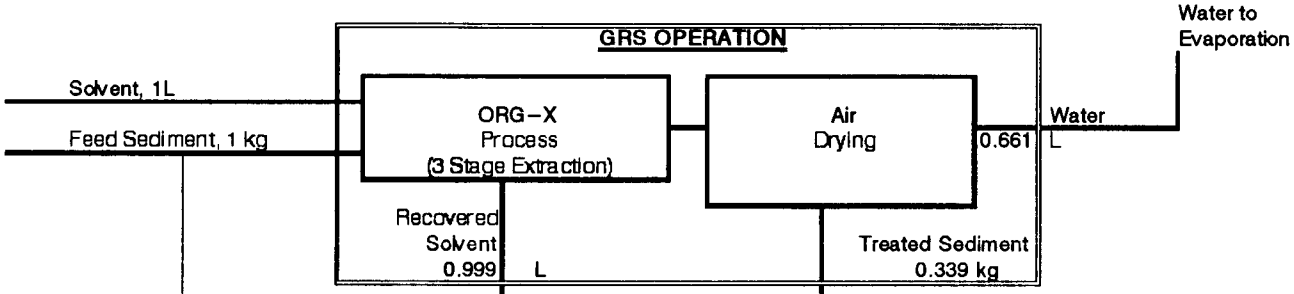
A	A	B	C	D	E
1		**TABLE B-2**			
2		**CONTAMINATED SOLVENT ANALYSES**			
3					
4	Gross Physico-Chemical Properties		solvent	contam.	duplicate
5			comment	solvent	
6					
7	Analyte	Units		ME-24	ME-24D
152	Metals				
153	Ag	ug/L		0.91	
154	As	ug/L		32.53	
155	Be	ug/L		0.21	0.202
156	Cd	ug/L		3.36	3.078
157	Cr	ug/L		72.83	70.219
158	Cu	ug/L		78.54	74.924
159	Ni	ug/L		39.74	38.143
160	Pb	ug/L		309.36	302.204
161	Sb	ug/L		3.32	3.864
162	Se	ug/L		55.34	37.715
163	Tl	ug/L		-11.90	-4.967
164	Zn	ug/L		126.39	125.953
165	Hg (Total)	ug/L			
166					
167					
168	Metals (TCLP)				
169	-Arsenic	mg/L (extract)		NA	
170	-Barium	mg/L (extract)		NA	
171	-Cadmium	mg/L (extract)		NA	
172	-Chromium	mg/L (extract)		NA	
173	-Lead	mg/L (extract)		NA	
174	-Mercury	mg/L (extract)		NA	
175	-Selenium	mg/L (extract)		NA	
176	-Silver	mg/L (extract)		NA	
177					
178	Organo-Cl Pesticides (TCLP)				
179	-Chlordane	mg/L (extract)		NA	
180	-Endrin	mg/L (extract)		NA	
181	-Heptachlor	mg/L (extract)		NA	
182	-Heptachlor epoxide	mg/L (extract)		NA	
183	-Lindane (g-BHC)	mg/L (extract)		NA	
184	-Methoxychlor	mg/L (extract)		NA	
185	-Toxaphene	mg/L (extract)		NA	
186					
187	Cl Herbicides (TCLP)				
188	-2,4-D	mg/L (extract)		NA	
189	-2,4,5-TP (Silvex)	mg/L (extract)		NA	
190					
191	Volatilve Organics (TCLP)				
192	-Benzene	mg/L (extract)		NA	

	A	B	C	D	E
1		**TABLE B-2**			
2		**CONTAMINATED SOLVENT ANALYSES**			
3					
4	Gross Physico-Chemical Properties		solvent	contam.	duplicate
5			comment	solvent	
6					
7	Analyte	Units		ME-24	ME-24D
193	-Carbon tetrachloride	mg/L (extract)		NA	
194	-Chlorobenzene	mg/L (extract)		NA	
195	-Chloroform	mg/L (extract)		NA	
196	-1,4-Dichlorobenzene	mg/L (extract)		NA	
197	-1,2-Dichloroethane	mg/L (extract)		NA	
198	-1,1-Dichloroethene	mg/L (extract)		NA	
199	Methyl ethyl ketone	mg/L (extract)		NA	
200	Tetrachloroethene	mg/L (extract)		NA	
201	Trichloroethene	mg/L (extract)		NA	
202	Vinyl chloride	mg/L (extract)		NA	
203					
204	Semi-Volatiles (TCLP)				
205	-Hexachloroethane	mg/L (extract)		NA	
206	-Nitrobenzene	mg/L (extract)		NA	
207	-Hexachlorobutadiene	mg/L (extract)		NA	
208	-2,4-Dinitrotoluene	mg/L (extract)		NA	
209	-Hexachlorobenzene	mg/L (extract)		NA	
210	-2,4,6-Trichlorophenol	mg/L (extract)		NA	
211	-2,4,5-Trichlorophenol	mg/L (extract)		NA	
212	-Pentachlorophenol	mg/L (extract)		NA	
213	-Pyridine	mg/L (extract)		NA	
214	-o-Cresol	mg/L (extract)		NA	
215	-m,p-Cresols	mg/L (extract)		NA	
216	-Total Cresols	mg/L (extract)		NA	
217					

A	A	B	C	D	E
1		**TABLE B-2**			
2		**CONTAMINATED SOLVENT ANALYSES**			
3					
4	Gross Physico-Chemical Properties		solvent	contam.	duplicate
5			comment	solvent	
6					
7	Analyte	Units		ME-24	ME-24D
218	PAHs (TCLP)				
219	Naphthalene	mg/L (extract)		NA	
220	2-Methylnaphthalene	mg/L (extract)		NA	
221	Acenapthylene	mg/L (extract)		NA	
222	Acenaphthene	mg/L (extract)		NA	
223	Dibenzofuran	mg/L (extract)		NA	
224	Fluorene	mg/L (extract)		NA	
225	Phenanthrene	mg/L (extract)		NA	
226	Anthracene	mg/L (extract)		NA	
227	Fluoranthene	mg/L (extract)		NA	
228	Pyrene	mg/L (extract)		NA	
229	Benzo(a)anthracene	mg/L (extract)		NA	
230	Chrysene	mg/L (extract)		NA	
231	Benzo(b)fluoranthene	mg/L (extract)		NA	
232	Benzo(k)fluoranthene	mg/L (extract)		NA	
233	Benzo(a)pyrene	mg/L (extract)		NA	
234	Indeno(123-cd)pyrene	mg/L (extract)		NA	
235	Dibenz(a,h)anthracene	mg/L (extract)		NA	
236	Benzo(ghi)perylene	mg/L (extract)		NA	
237					
238	Dioxins/Furans (TCLP)				
239	2378-TCDD	ng/L (extract)		8	
240	12378-PeCDD	ng/L (extract)		9.8	
241	123478-HxCDD	ng/L (extract)		10.2	
242	123678-HxCDD	ng/L (extract)		30.1	
243	123789-HxCDD	ng/L (extract)		22	
244	1234678-HpCDD	ng/L (extract)		499	
245	OCDD	ng/L (extract)		3710	
246					
247	2378-TCDF	ng/L (extract)		75.4	
248	12378-PeCDF	ng/L (extract)		66.3	
249	23478-PeCDF	ng/L (extract)		34	
250	123478-HxCDF	ng/L (extract)		298	
251	123678-HxCDF	ng/L (extract)		110	
252	234678-HxCDF	ng/L (extract)		31.5	
253	123789-HxCDF	ng/L (extract)		1.2	
254	1234678-HpCDF	ng/L (extract)		1170	
255	1234789-HpCDF	ng/L (extract)		25.3	
256	OCDF	ng/L (extract)		1010	
257					

	A	B	C	D	E
1		**TABLE B-2**			
2		**CONTAMINATED SOLVENT ANALYSES**			
3					
4	Gross Physico-Chemical Properties		solvent	contam.	duplicate
5			comment	solvent	
6					
7	Analyte	Units		ME-24	ME-24D
258	Totals: Dioxins				
259	-TCDD	ng/L (extract)		66.8	
260	-PeCDD	ng/L (extract)		93.9	
261	-HxCDD	ng/L (extract)		275	
262	-HpCDD	ng/L (extract)		1070	
263					
264	Totals: Furans				
265	-TCDF	ng/L (extract)		660	
266	-PeCDF	ng/L (extract)		752	
267	-HxCDF	ng/L (extract)		1100	
268	-HpCDF	ng/L (extract)		1430	
269					
270					
271	PCBs (TCLP)				
272					
273	PCBs:	ug/L (extract)			
274	2-Mono	ug/L (extract)		NA	
275	44'-Di	ug/L (extract)		NA	
276	244'-Tri	ug/L (extract)		NA	
277	22'55'-Tetra	ug/L (extract)		NA	
278	33'44'-Tetra	ug/L (extract)		NA	
279	2344'5-Penta	ug/L (extract)		NA	
280	233'44'-Penta	ug/L (extract)		NA	
281	33'44'5-Penta	ug/L (extract)		NA	
282	233'44'5-Hexa	ug/L (extract)		NA	
283	33'44'55'-Hexa	ug/L (extract)		NA	
284	22'344'55'-Hepta	ug/L (extract)		NA	
285	22'33'44'55'-Octa	ug/L (extract)		NA	
286	22'33'44'55'6-Nona	ug/L (extract)		NA	
287	Deca	ug/L (extract)		NA	
288					
289	PCB Totals:				
290	-Mono	ug/L (extract)		NA	
291	-Di	ug/L (extract)		NA	
292	-Tri	ug/L (extract)		NA	
293	-Tetra	ug/L (extract)		NA	
294	-Penta	ug/L (extract)		NA	
295	-Hexa	ug/L (extract)		NA	
296	-Hepta	ug/L (extract)		NA	
297	-Octa	ug/L (extract)		NA	
298	-Nona	ug/L (extract)		NA	

FIGURE B–1
BROOKHAVEN NATIONAL LABORATORY
ORG–X BENCH–SCALE TREATABILITY STUDY
MASS BALANCE OF CONTAMINANTS

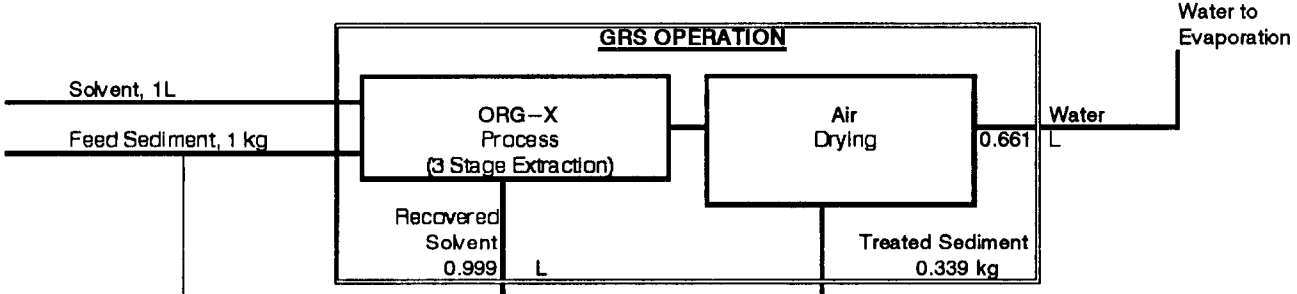


Description/ Contaminant	Feed Sediment, kg 1		Recovered Solvent, L 0.999		Treated Sediment		Material Balance ((In–Out)/In) %	% Reduction in Sediment
Medium gravel > 4.75 mm	0.04				0.000			
Fine grave 2–4.75	0.38				1.010			
V. coarse sand 0.85–2	0.83				6.935			
Coarse sand 0.425–0.85	2.15				20.350			
Medium sand 0.24–0.425	5.05				12.500			
Fine sand 0.106–0.24	9.57				14.400			
V. fine sand 0.075–0.106	2.80				4.150			
Clay	35.57				13.400			
Silt	44.95				27.850			
pH	7.90				6.960			
Solids (total)	33.05				97.350			
Sulfides (total)	7833.33				130.000			
Organic carbon (total)	7.32				6.095			
	Conc. ug/kg	Mass ug	Conc. ug/l	Mass ug	Conc. ug/kg	Mass ug		
PCB Totals:								
–Mono	108.62	35.8989	NA		16.60	5.4863	NC	84.72
–Di	379.33	125.3686	NA		77.65	25.6633	NC	79.53
–Tri	727.83	240.5478	NA		107.50	35.5288	NC	85.23
–Tetra	1588.33	524.9431	NA		152.00	50.2360	NC	90.43
–Penta	1236.67	408.7194	NA		109.00	36.0245	NC	91.19
–Hexa	808.33	267.1531	NA		62.65	20.7058	NC	92.25
–Hepta	294.50	97.3323	NA		35.40	11.6997	NC	87.98
–Octa	95.83	31.6718	NA		8.85	2.9249	NC	90.76
–Nona	20.38	6.7356	NA		2.40	0.7932	NC	88.22

NOTES:

1. NA = Not analyzed or not available
2. Sediment analytical data are on a dry basis.
3. NC = The problem cann't be solved because contaminant concentration in more than two streams is an inequality (< or >) or sufficient data are not available.
4. Concentration, shown with a "*", represents the method detection limit (MDL) and contaminant concentration was less than the MDL.

FIGURE B-1
BROOKHAVEN NATIONAL LABORATORY
ORG-X BENCH-SCALE TREATABILITY STUDY
MASS BALANCE OF CONTAMINANTS



Description/ Contaminant	Feed Sediment, kg 1			Recovered Solvent, L 0.999			Treated Sediment			Material Balance ((In-Out)/In) %	% Reduction in Sediment
	Conc. ug/kg		Mass ug	Conc. ug/l		Mass ug	Conc. ug/kg		Mass ug		
Pesticides (Cl):											
a-BHC	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
a-Chlordane	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
Aldrin	75.02		24.7941	4950	*	4945.0500	1.77	*	0.5850	NC	97.64
beta-BHC	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
delta-BHC	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
4,4'-DDD	162.10		53.5741	9900	*	9890.1000	9.18		3.0323	NC	94.34
4,4'-DDE	160.57		53.0684	9900	*	9890.1000	3.54	*	1.1700	NC	97.80
4,4'-DDT	28.90	*	9.5515	9900	*	9890.1000	3.54	*	1.1700	NC	NC
Dieldrin	74.45		24.6057	9900	*	9890.1000	3.54	*	1.1700	NC	95.25
Endrin	28.90	*	9.5515	9900	*	9890.1000	3.54	*	1.1700	NC	NC
Endrin aldehyde	28.90	*	9.5515	9900	*	9890.1000	3.54	*	1.1700	NC	NC
Endosulfan I	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
Endosulfan II	28.90	*	9.5515	9900	*	9890.1000	3.54	*	1.1700	NC	NC
Endosulfan sulfate	28.90	*	9.5515	9900	*	9890.1000	3.54	*	1.1700	NC	NC
g-BHC (Lindane)	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
g-Chlordane	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
Heptachlor	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
Heptachlor epoxide	14.47	*	4.7823	4950	*	4945.0500	1.77	*	0.5850	NC	NC
Methoxychlor	144.53	*	47.7672	49510	*	49460.4900	17.70	*	5.8499	NC	NC
Toxaphene	1445.15	*	477.6221	495050	*	494554.9500	176.99	*	58.4935	NC	NC
Chlorinated Herbicides											
2,4-D	0.20	*	0.0661	6000	*	5994.0000	0.20	*	0.0661	NC	NC
2,4,5-TP (Silvex)	0.05	*	0.0165	2000	*	1998.0000	0.05	*	0.0165	NC	NC
2,4,5-T	0.05	*	0.0165	2000	*	1998.0000	0.05	*	0.0165	NC	NC

NOTES:

1. NA = Not analyzed or not available
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3. NC = The problem cann't be solved because contaminant concentration in more than two streams is an inequality (< or >) or sufficient data are not available.
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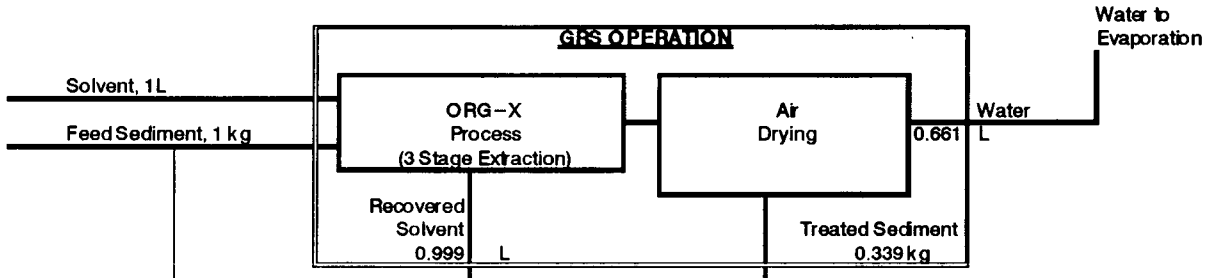
BROOKHAVEN NATIONAL LABORATORY
ORG-X BENCH-SCALE TREATABILITY STUDY
MASS BALANCE OF CONTAMINANTS



Description/ Contaminant	Feed Sediment, kg 1			Recovered Solvent, L 0.999			Treated Sediment			Material Balance ((In-Out)/In) %	% Reduction in Sediment
	Conc. ug/kg		Mass ug	Conc. ug/l		Mass ug	Conc. ug/kg		Mass ug		
Semivolatile Compounds (including PAHs):											
Phenol	638.00		210.8590	1110.00		1108.8900	176.45		58.3151	-453.55	72.34
bis(2-Chloroethyl)ether	754.50	*	249.3623	870.00	*	869.1300	136.00	*	44.9480	NC	NC
2-Chlorophenol	691.67	*	228.5969	720.00	*	719.2800	146.50	*	48.4183	NC	NC
1,3-Dichlorobenzene	507.33	*	167.6726	660.00	*	659.3400	140.50	*	46.4353	NC	NC
1,4-Dichlorobenzene	517.00	*	170.8685	300.00		299.7000	56.65		18.7228	NC	NC
1,2-Dichlorobenzene	573.67	*	189.5979	6000.00		5994.0000	58.40		19.3012	NC	NC
Benzyl alcohol	1378.33	*	455.5381	2010.00	*	2007.9900	341.00	*	112.7005	NC	NC
2,2'-oxybis(1-Chloropropane)	864.17	*	285.6082	960.00	*	959.0400	119.00	*	39.3295	NC	NC
2-Methylphenol	875.60	*	289.3858	1000.00	*	999.0000	148.00	*	48.9140	NC	NC
3/4-Methylphenol	1389.67		459.2859	1020.00	*	1018.9800	253.50		83.7818	NC	81.76
N-Nitroso-di-n-propylamine	1091.50		360.7408	1240.00	*	1238.7600	200.50	*	66.2653	NC	81.63
Hexachloroethane	1243.83	*	411.0858	1300.00	*	1298.7000	192.00	*	63.4560	NC	NC
Nitrobenzene	570.83	*	188.6593	690.00	*	689.3100	105.00	*	34.7025	NC	NC
Isophorone	334.33	*	110.4961	1760.00		1758.2400	63.00	*	20.8215	NC	NC
2-Nitrophenol	1054.67	*	348.5684	1280.00	*	1278.7200	265.00	*	87.5825	NC	NC
2,4-Dimethylphenol	717.17	*	237.0247	920.00	*	919.0800	119.00	*	39.3295	NC	NC
bis(2-Chloroethoxy)methane	631.83	*	208.8198	700.00	*	699.3000	106.00	*	35.0330	NC	NC
Benzoic acid	1335.17	*	441.2737	1600.00	*	1598.4000	3815.50		1261.0228	NC	NC
2,4-Dichlorophenol	684.33	*	226.1711	1100.00	*	1098.9000	162.00	*	53.5410	NC	NC
1,2,4-Trichlorobenzene	623.17	*	205.9577	870.00	*	869.1300	209.50		69.2398	NC	NC
Naphthalene	2726.67		901.1644	3120.00		3116.8800	754.50		249.3623	-273.54	72.33
4-Chloroaniline	1002.83		331.4353	680.00		679.3200	121.50	*	40.1558	-117.08	87.88
Hexachlorobutadiene	711.33	*	235.0946	1260.00	*	1258.7400	159.50	*	52.7148	NC	NC
4-Chloro-3-methylphenol	839.17	*	277.3457	1230.00	*	1228.7700	129.00	*	42.6345	NC	NC
2-Methylnaphthalene	2304.00		761.4720	630.00		629.3700	491.00		162.2755	-3.96	78.69
Hexachlorocyclopentadiene	668.33	*	220.8831	1240.00	*	1238.7600	195.50	*	64.6128	NC	NC
2,4,6-Trichlorophenol	843.17	*	278.6677	1630.00	*	1628.3700	217.00	*	71.7185	NC	NC
2,4,5-Trichlorophenol	798.00	*	263.7390	1610.00	*	1608.3900	201.00	*	66.4305	NC	NC
2-Chloronaphthalene	369.67	*	122.1759	480.00	*	479.5200	81.00	*	26.7705	NC	NC

NOTES:

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2. Sediment analytical data are on a dry basis.
3. NC = The problem cann't be solved because contaminant concentration in more than two streams is an inequality (< or >) or sufficient data are not available.
4. Concentration, shown with a "*", represents the method detection limit (MDL) and contaminant concentration was less than the MDL.

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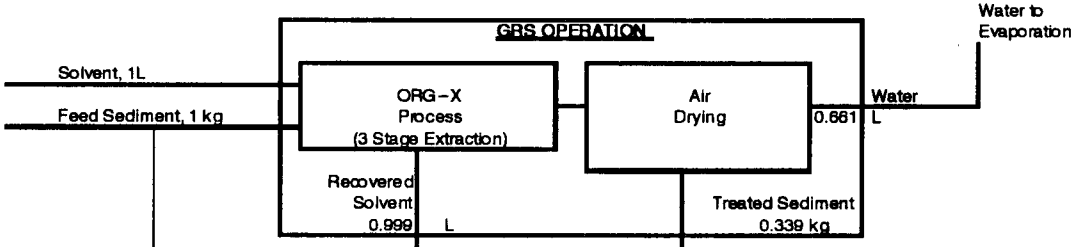
BROOKHAVEN NATIONAL LABORATORY
ORG–X BENCH–SCALE TREATABILITY STUDY
MASS BALANCE OF CONTAMINANTS

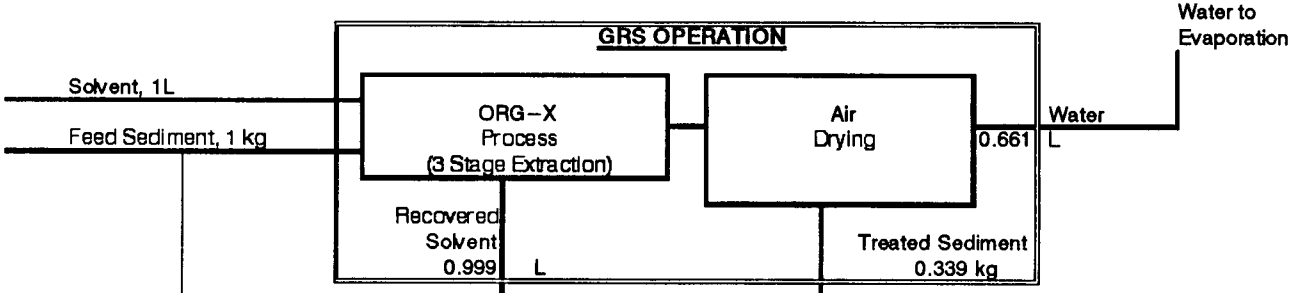


Description/ Contaminant	Feed Sediment, kg 1		Recovered Solvent, L 0.999		Treated Sediment		Material Balance ((In–Out)/In) %	% Reduction in Sediment
Semivolatile Compounds (contd.):	Conc. ug/kg	Mass ug	Conc. ug/l	Mass ug	Conc. ug/kg	Mass ug		
2–Nitroaniline	1092.17 *	360.9622	1760.00 *	1758.2400	190.50 *	62.9603	NC	NC
Dimethylphthalate	312.17 *	103 1722	490.00 *	489.5100	66.50 *	21.9783	NC	NC
2,6–Dinitrotoluene	1388.00 *	458.7340	2080.00 *	2077.9200	295.00 *	97.4975	NC	NC
2,4–Dinitrotoluene	1011.83 *	334 4098	1520.00 *	1518.4800	220.00 *	72.7100	NC	NC
Acenapthylene	1288.50	425.8493	590.00	589.4100	119.00	39.3295	–47.64	90.76
3–Nitroaniline	1350.53 *	446.3502	1720.00 *	1718.2800	291.50 *	96.3408	NC	NC
Acenaphthene	1042.33	344.4901	740.00	739.2600	105.50	34.8678	–124.72	89.88
2,4–Dinitrophenol	2467.33 *	815.4526	5000.00 *	4995.0000	617.50 *	204.0838	NC	NC
4–Nitrophenol	1618.17 *	534.8052	2710.00 *	2707.2900	293.00 *	96.8365	NC	NC
Dibenzofuran	1172.00	387.3460	320.00	319.6800	388.00	128.2340	–15.64	66.89
Diethylphthalate	276.17 *	91.2742	400.00 *	399.6000	103.00 *	34.0415	NC	NC
4–Chlorophenyl–phenylether	540.33 *	178.5791	1050.00 *	1048.9500	149.50 *	49.4098	NC	NC
Fluorene	1369.17	452.5107	800.00	799.2000	337.00	111.3785	–101.23	75.39
4–Nitroaniline	1319.00 *	435.9295	1770.00 *	1768.2300	303.50 *	100.3068	NC	NC
4,6–Dinitro–2–methylphenol	1731.33 *	572.2046	2760.00 *	2757.2400	465.00 *	153.6825	NC	NC
N–Nitrosodiphenylamine	566.50 *	187.2283	750.00 *	749.2500	145.50 *	48.0878	NC	NC
4–Bromophenyl–phenylether	1016.17 *	335.8442	1600.00 *	1598.4000	318.00 *	105.0990	NC	NC
Hexachlorobenzene	779.00 *	257.4595	1350.00 *	1348.6500	240.50 *	79.4853	NC	NC
Pentachlorophenol	1038.83 *	343.3333	2360.00 *	2357.6400	350.00 *	115.6750	NC	NC
Phenanthrene	6586.00	2176.6730	2560.00	2557.4400	2349.00	776.3445	–53.16	64.33
Anthracene	3702.17	1223.5672	1760.00	1758.2400	1099.00	363.2195	–73.38	70.31
Di–n–butyl phthalate	1226.60	405.3913	670.00	669.3300	262.50	86.7563	–86.51	78.60
Fluoranthene	10323.67	3411.9729	5670.00	5664.3300	2499.00	825.9195	–90.22	75.79
Pyrene	7101.67	2347.1019	4380.00	4375.6200	3599.50	1189.6348	–137.11	49.31
Butylbenzylphthalate	1473.17	486.8827	660.00	659.3400	148.00	48.9140	–45.47	89.95
3,3'–Dichlorobenzidine	287.67 *	95.0749	790.00 *	789.2100	132.00 *	43.6260	NC	NC
bis–2–ethylhexylphthalate	48630.83	16072.4893	39770.00	39730.2300	5882.00	1944.0010	–159.29	87.90
Benzo(a)anthracene	4484.17	1482.0182	2380.00	2377.6200	1316.50	435.1033	–89.79	70.64
Chrysene	4584.33	1515.1211	2580.00	2577.4200	1887.00	623.6535	–111.28	58.84
Di–n–octylphthalate	NA	NA	750.00	749.2500	58.00 *	19.1690	NC	NC
Benzo(b)fluoranthene	2922.17	965.7772	1710.00	1708.2900	1547.50	511.4488	–129.84	47.04
Benzo(k)fluoranthene	1107.33	365.9726	640.00	639.3600	528.50	174.6693	–122.43	52.27
Benzo(a)pyrene	2550.83	843.0493	1380.00	1378.6200	886.50	292.9683	–98.28	65.25
Indeno(123–cd)pyrene	1075.67	355.5089	830.00	829.1700	382.50	126.4163	–168.79	64.44
Dibenz(a,h)anthracene	397.00	131.2085	430.00	429.5700	189.00	62.4645	–275.00	52.39
Benzo(ghi)perylene	1254.33	414.5561	1020.00	1018.9800	341.50	112.8658	–173.03	72.77
Benzo(e)pyrene	2125.50	702.4778	1210.00	1208.7900	734.00	242.5870	–106.61	65.47
Perylene	948.50	313.4793	220.00	219.7800	494.50	163.4323	–22.24	47.87

NOTES:

1. NA = Not analyzed or not available
2. Sediment analytical data are on a dry basis.
3. NC = The problem cann't be solved because contaminant concentration in more than two streams is an inequality (< or >) or sufficient data are not available.
4. Concentration, shown with a "*", represents the method detection limit (MDL) and contaminant concentration was less than the MDL

FIGURE B-1
BROOKHAVEN NATIONAL LABORATORY
ORG-X BENCH-SCALE TREATABILITY STUDY
MASS BALANCE OF CONTAMINANTS



Description/ Contaminant	Feed Sediment, kg 1		Recovered Solvent, L 0.999		Treated Sediment		Material Balance ((In-Out)/In) %	% Reduction in Sediment
Totals: Dioxins	Conc. ng/kg	Mass ng	Conc. ng/l	Mass ng	Conc. ng/kg	Mass ng		
-TCDD	246.10	81.3361	66.8	66.7332	333.00	110.0565	-117.36	-35.31
-PeCDD	378.17	124.9852	93.9	93.8061	548.00	181.1140	-119.96	-44.91
-HxCDD	1370.00	452.7850	275	274.7250	812.50	268.5313	-19.98	40.69
-HpCDD	4450.00	1470.7250	1070	1068.9300	1520.00	502.3600	-6.84	65.84
Totals: Furans								
-TCDF	2371.67	783.8369	660	659.3400	4280.00	1414.5400	-164.58	-80.46
-PeCDF	2853.33	943.0256	752	751.2480	4185.00	1383.1425	-126.33	-46.67
-HxCDF	5175.00	1710.3375	1100	1098.9000	4915.00	1624.4075	-59.23	5.02
-HpCDF	6068.33	2005.5831	1430	1428.5700	3655.00	1207.9775	-31.46	39.77
	Conc. mg/kg	Mass mg	Conc. mg/l	Mass mg	Conc. mg/kg	Mass mg		
Metals								
Be	0.56 *	0.1851	0.01 *	0.0100	0.19 *	0.0621	NC	NC
Cd	37.05	12.2450	0.034	0.0340	36.25	11.9806	1.88	2.16
Cr	376.67	124.4894	0.728	0.7273	385.00	127.2425	-2.80	-2.21
Cu	1171.67	387.2369	0.785	0.7842	1180.00	389.9900	-0.91	-0.71
Ni	297.17	98.2147	0.397	0.3966	289.50	95.6798	2.18	2.58
Pb	617.00	203.9185	3.09	3.0869	628.00	207.5540	-3.30	-1.78
Sb	10.29	3.4008	0.04 *	0.0400	7.69	2.5399	NC	25.32
Se	3.24	1.0708	0.553	0.5524	2.72	0.8990	-35.54	16.05
Tl	2.77 *	0.9155	0.05 *	0.0500	1.85	0.6114	NC	NC
Zn	1725.00	570.1125	1.26	1.2587	1705.00	563.5025	0.94	1.16
Hg (total)	1.29	0.4263			3.06	1.0097	-136.82	-136.82

NOTES:

1. NA = Not analyzed or not available
2. Sediment analytical data are on a dry basis.
3. NC = The problem cann't be solved because contaminant concentration in more than two streams is an inequality (< or >) or sufficient data are not available.
4. Concentration, shown with a "*", represents the method detection limit (MDL) and contaminant concentration was less than the MDL.

APPENDIX C

SOLFIX ANALYTICAL RESULTS

A	A	B	C	D	E	F	G	H	I	J	K
1							TABLE C-1				
2						DIRECT SOLFIX PROCESS PERFORMANCE					
3											
4	Gross Physico-Chemical Properties					solid block	solid block				
5											
6			Feed	Feed	Comment					Amount	%
7	Analyte	Units	Comment	Mean	SO:LFIX	ME-21	ME-22	n	Mean	Change	Change
8											
9	Metals (TCLP)										
10	-Arsenic	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
11	-Barium	mg/L (extract)	All <	0.50000	All <	0.5000	0.5000	2	0.50000	NC	NC
12	-Cadmium	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	0.01000	NC	NC
13	-Chromium	mg/L (extract)		0.02833	All <	0.0100	0.0100	2	0.01000	0.02	>64.70
14	-Lead	mg/L (extract)	All <	0.05000	All <	0.0500	0.0500	2	0.05000	NC	NC
15	-Mercury	mg/L (extract)	All <	0.00100	All <	0.0010	0.0010	2	0.00100	NC	NC
16	-Selenium	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
17	-Silver	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	0.01000	NC	NC
18											
19	Organo-Cl Pesticides (TCLP)										
20	-Chlordane	mg/L (extract)	All <	0.00500	All <	0.0050	0.0050	2	0.00500	NC	NC
21	-Endrin	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	0.00050	NC	NC
22	-Heptachlor	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	0.00050	NC	NC
23	-Heptachlor epoxide	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	0.00050	NC	NC
24	-Lindane (g-BHC)	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	0.00050	NC	NC
25	-Methoxychlor	mg/L (extract)	All <	0.00100	All <	0.0010	0.0010	2	0.00100	NC	NC
26	-Toxaphene	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	0.01000	NC	NC
27											
28	Cl Herbicides (TCLP)										
29	-2,4-D	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
30	-2,4,5-TP (Silvex)	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	0.01000	NC	NC
31											
32	Volatilve Organics (TCLP)										
33	-Benzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
34	-Carbon tetrachloride	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
35	-Chlorobenzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
36	-Chloroform	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
37	-1,4-Dichlorobenzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
38	-1,2-Dichloroethane	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
39	-1,1-Dichloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
40	Methyl ethyl ketone	mg/L (extract)	All <	5.00000	All <	5.0000	5.0000	2	5.00000	NC	NC
41	Tetrachloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
42	Trichloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
43	Vinyl chloride	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
44											
45	Semi-Volatiles (TCLP)										
46	-Hexachloroethane	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
47	-Nitrobenzene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
48	-Hexachlorobutadiene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
49	-2,4-Dinitrotoluene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
50	-Hexachlorobenzene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
51	-2,4,6-Trichlorophenol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
52	-2,4,5-Trichlorophenol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
53	-Pentachlorophenol	mg/L (extract)	All <	0.25000	All <	0.2500	0.2500	2	0.25000	NC	NC
54	-Pyridine	mg/L (extract)	All <	0.25000	All <	0.2500	0.2500	2	0.25000	NC	NC
55	-o-Cresol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
56	-m,p-Cresols	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
57	-Total Cresols	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
58											

A	A	B	C	D	E	F	G	H	I	J	K
1							TABLE C-1				
2						DIRECT SOLFIX PROCESS PERFORMANCE					
3											
4	Gross Physico-Chemical Properties					solid block	solid block				
5											
6			Feed	Feed	Comment					Amount	%
7	Analyte	Units	Comment	Mean	SO:LFIX	ME-21	ME-22	n	Mean	Change	Change
59	PAHs (TCLP)										
60	Naphthalene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
61	2-Methylnaphthalene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
62	Acenapthylene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
63	Acenaphthene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
64	Dibenzofuran	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
65	Fluorene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
66	Phenanthrene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
67	Anthracene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
68	Fluoranthene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
69	Pyrene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
70	Benzo(a)anthracene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
71	Chrysene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
72	Benzo(b)fluoranthene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
73	Benzo(k)fluoranthene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
74	Benzo(a)pyrene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
75	Indeno(123-cd)pyrene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
76	Dibenz(a,h)anthracene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
77	Benzo(ghi)perylene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
78											
79	Dioxins/Furans (TCLP)										
80	2378-TCDD	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
81	12378-PeCDD	ng/L (extract)	All <	0.00717	All <	NA	NA		NA	NC	NC
82	123478-HxCDD	ng/L (extract)	All <	0.00700	All <	NA	NA		NA	NC	NC
83	123678-HxCDD	ng/L (extract)	All <	0.00600	All <	NA	NA		NA	NC	NC
84	123789-HxCDD	ng/L (extract)	All <	0.00617	All <	NA	NA		NA	NC	NC
85	1234678-HpCDD	ng/L (extract)		0.00867	All <	NA	NA		NA	NC	NC
86	OCDD	ng/L (extract)		0.03033	All <	NA	NA		NA	NC	NC
87											
88	2378-TCDF	ng/L (extract)	All <	0.00233	All <	NA	NA		NA	NC	NC
89	12378-PeCDF	ng/L (extract)	All <	0.00417	All <	NA	NA		NA	NC	NC
90	23478-PeCDF	ng/L (extract)	All <	0.00400	All <	NA	NA		NA	NC	NC
91	123478-HxCDF	ng/L (extract)		0.00533	All <	NA	NA		NA	NC	NC
92	123678-HxCDF	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
93	234678-HxCDF	ng/L (extract)		0.00467	All <	NA	NA		NA	NC	NC
94	123789-HxCDF	ng/L (extract)	All <	0.00467	All <	NA	NA		NA	NC	NC
95	1234678-HpCDF	ng/L (extract)		0.00925	All <	NA	NA		NA	NC	NC
96	1234789-HpCDF	ng/L (extract)	All <	0.00650	All <	NA	NA		NA	NC	NC
97	OCDF	ng/L (extract)	All <	0.00883	All <	NA	NA		NA	NC	NC
98											
99	Totals: Dioxins										
100	-TCDD	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
101	-PeCDD	ng/L (extract)	All <	0.00717	All <	NA	NA		NA	NC	NC
102	-HxCDD	ng/L (extract)	All <	0.00617	All <	NA	NA		NA	NC	NC
103	-HpCDD	ng/L (extract)		0.01167	All <	NA	NA		NA	NC	NC
104											
105	Totals: Furans										
106	-TCDF	ng/L (extract)	All <	0.00233	All <	NA	NA		NA	NC	NC
107	-PeCDF	ng/L (extract)	All <	0.00400	All <	NA	NA		NA	NC	NC
108	-HxCDF	ng/L (extract)		0.01100	All <	NA	NA		NA	NC	NC
109	-HpCDF	ng/L (extract)		0.00925	All <	NA	NA		NA	NC	NC
110											
111											
112	PCBs (TCLP)										
113											
114	PCBs:	ug/L (extract)				NA	NA		NA		
115	2-Mono	ug/L (extract)		0.02603	All <	NA	NA		NA	NC	NC
116	44'-Di	ug/L (extract)		0.00342	All <	NA	NA		NA	NC	NC
117	244'-Tri	ug/L (extract)		0.00583	All <	NA	NA		NA	NC	NC
118	22'55'-Tetra	ug/L (extract)		0.00307	All <	NA	NA		NA	NC	NC
119	33'44'-Tetra	ug/L (extract)		0.00024	All <	NA	NA		NA	NC	NC
120	2344'5-Penta	ug/L (extract)		0.00012	All <	NA	NA		NA	NC	NC
121	233'44'-Penta	ug/L (extract)		0.00106	All <	NA	NA		NA	NC	NC
122	33'44'5-Penta	ug/L (extract)	All <	0.00004	All <	NA	NA		NA	NC	NC
123	233'44'5-Hexa	ug/L (extract)		0.00031	All <	NA	NA		NA	NC	NC
124	33'44'55'-Hexa	ug/L (extract)	All <	0.00006	All <	NA	NA		NA	NC	NC
125	22'344'55'-Hepta	ug/L (extract)		0.00194	All <	NA	NA		NA	NC	NC
126	22'33'44'55'-Octa	ug/L (extract)		0.00039	All <	NA	NA		NA	NC	NC
127	22'33'44'55'6-Nona	ug/L (extract)	All <	0.00019	All <	NA	NA		NA	NC	NC
128	Deca	ug/L (extract)	All <	0.00014	All <	NA	NA		NA	NC	NC
129											

A	A	B	C	D	E	F	G	H	I	J	K
1							TABLE C-1				
2						DIRECT SOLFIX PROCESS PERFORMANCE					
3											
4	Gross Physico-Chemical Properties					solid block	solid block				
5											
6			Feed	Feed	Comment					Amount	%
7	Analyte	Units	Comment	Mean	SO:LFIX	ME-21	ME-22	n	Mean	Change	Change
130	PCB Totals:										
131	-Mono	ug/L (extract)		0.03497	All <	NA	NA		NA	NC	NC
132	-Di	ug/L (extract)		0.03523	All <	NA	NA		NA	NC	NC
133	-Tri	ug/L (extract)		0.03662	All <	NA	NA		NA	NC	NC
134	-Tetra	ug/L (extract)		0.02352	All <	NA	NA		NA	NC	NC
135	-Penta	ug/L (extract)		0.01562	All <	NA	NA		NA	NC	NC
136	-Hexa	ug/L (extract)		0.01230	All <	NA	NA		NA	NC	NC
137	-Hepta	ug/L (extract)		0.00602	All <	NA	NA		NA	NC	NC
138	-Octa	ug/L (extract)		0.00150	All <	NA	NA		NA	NC	NC
139	-Nona	ug/L (extract)	All <	0.00022	All <	NA	NA		NA	NC	NC
140											
141	NA = Not applicable or Not Available										
142	NC = Cannot be calculated because (1) two values are inequalities, or (2) at least one value is rejected or not available.										

A	A	B	C	D	E	F	G	H	I	J	K
1							TABLE C-1				
2						DIRECT SOLFIX PROCESS PERFORMANCE					
3											
4	Gross Physico-Chemical Properties					solid block	solid block				
5			Raw	Raw							
6			Sediment	Sediment	Comment					Amount	%
7	Analyte	Units	Comment	Mean	SO:LFIX	ME-21	ME-22	n	Mean	Change	Change
8											
9	Metals (TCLP)										
10	-Arsenic	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
11	-Barium	mg/L (extract)	All <	0.50000	All <	0.5000	0.5000	2	0.50000	NC	NC
12	-Cadmium	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	0.01000	NC	NC
13	-Chromium	mg/L (extract)		0.02833	All <	0.0100	0.0100	2	0.01000	0.02	>64.70
14	-Lead	mg/L (extract)	All <	0.05000	All <	0.0500	0.0500	2	0.05000	NC	NC
15	-Mercury	mg/L (extract)	All <	0.00100	All <	0.0010	0.0010	2	0.00100	NC	NC
16	-Selenium	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
17	-Silver	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	0.01000	NC	NC
18											
19	Organo-Cl Pesticides (TCLP)										
20	-Chlordane	mg/L (extract)	All <	0.00500	All <	0.0050	0.0050	2	0.00500	NC	NC
21	-Endrin	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	0.00050	NC	NC
22	-Heptachlor	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	0.00050	NC	NC
23	-Heptachlor epoxide	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	0.00050	NC	NC
24	-Lindane (g-BHC)	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	0.00050	NC	NC
25	-Methoxychlor	mg/L (extract)	All <	0.00100	All <	0.0010	0.0010	2	0.00100	NC	NC
26	-Toxaphene	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	0.01000	NC	NC
27											
28	Cl Herbicides (TCLP)										
29	-2,4-D	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
30	-2,4,5-TP (Silvex)	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	0.01000	NC	NC
31											
32	Volatilve Organics (TCLP)										
33	-Benzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
34	-Carbon tetrachloride	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
35	-Chlorobenzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
36	-Chloroform	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
37	-1,4-Dichlorobenzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
38	-1,2-Dichloroethane	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
39	-1,1-Dichloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
40	Methyl ethyl ketone	mg/L (extract)	All <	5.00000	All <	5.0000	5.0000	2	5.00000	NC	NC
41	Tetrachloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
42	Trichloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	0.20000	NC	NC
43	Vinyl chloride	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
44											
45	Semi-Volatiles (TCLP)										
46	-Hexachloroethane	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
47	-Nitrobenzene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
48	-Hexachlorobutadiene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
49	-2,4-Dinitrotoluene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
50	-Hexachlorobenzene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
51	-2,4,6-Trichlorophenol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
52	-2,4,5-Trichlorophenol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
53	-Pentachlorophenol	mg/L (extract)	All <	0.25000	All <	0.2500	0.2500	2	0.25000	NC	NC
54	-Pyridine	mg/L (extract)	All <	0.25000	All <	0.2500	0.2500	2	0.25000	NC	NC
55	-o-Cresol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
56	-m,p-Cresols	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
57	-Total Cresols	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	0.10000	NC	NC
58											

	A	B	C	D	E	F	G	H	I	J	K
1							TABLE C-1				
2						DIRECT SOLFIX PROCESS PERFORMANCE					
3											
4	Gross Physico-Chemical Properties					solid block	solid block				
5			Raw	Raw							
6			Sediment	Sediment	Comment					Amount	%
7	Analyte	Units	Comment	Mean	SO:LFIX	ME-21	ME-22	n	Mean	Change	Change
59	PAHs (TCLP)										
60	Naphthalene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
61	2-Methylnaphthalene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
62	Acenapthylene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
63	Acenaphthene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
64	Dibenzofuran	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
65	Fluorene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
66	Phenanthrene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
67	Anthracene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
68	Fluoranthene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
69	Pyrene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
70	Benzo(a)anthracene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
71	Chrysene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
72	Benzo(b)fluoranthene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
73	Benzo(k)fluoranthene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
74	Benzo(a)pyrene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
75	Indeno(123-cd)pyrene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
76	Dibenz(a,h)anthracene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
77	Benzo(ghi)perylene	mg/L (extract)	All <	0.10000	All <	NA	NA		NA	NC	NC
78											
79	Dioxins/Furans (TCLP)										
80	2378-TCDD	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
81	12378-PeCDD	ng/L (extract)	All <	0.00717	All <	NA	NA		NA	NC	NC
82	123478-HxCDD	ng/L (extract)	All <	0.00700	All <	NA	NA		NA	NC	NC
83	123678-HxCDD	ng/L (extract)	All <	0.00600	All <	NA	NA		NA	NC	NC
84	123789-HxCDD	ng/L (extract)	All <	0.00617	All <	NA	NA		NA	NC	NC
85	1234678-HpCDD	ng/L (extract)		0.00867	All <	NA	NA		NA	NC	NC
86	OCDD	ng/L (extract)		0.03033	All <	NA	NA		NA	NC	NC
87											
88	2378-TCDF	ng/L (extract)	All <	0.00233	All <	NA	NA		NA	NC	NC
89	12378-PeCDF	ng/L (extract)	All <	0.00417	All <	NA	NA		NA	NC	NC
90	23478-PeCDF	ng/L (extract)	All <	0.00400	All <	NA	NA		NA	NC	NC
91	123478-HxCDF	ng/L (extract)		0.00533	All <	NA	NA		NA	NC	NC
92	123678-HxCDF	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
93	234678-HxCDF	ng/L (extract)		0.00467	All <	NA	NA		NA	NC	NC
94	123789-HxCDF	ng/L (extract)	All <	0.00467	All <	NA	NA		NA	NC	NC
95	1234678-HpCDF	ng/L (extract)		0.00925	All <	NA	NA		NA	NC	NC
96	1234789-HpCDF	ng/L (extract)	All <	0.00650	All <	NA	NA		NA	NC	NC
97	OCDF	ng/L (extract)	All <	0.00883	All <	NA	NA		NA	NC	NC
98											
99	Totals: Dioxins										
100	-TCDD	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
101	-PeCDD	ng/L (extract)	All <	0.00717	All <	NA	NA		NA	NC	NC
102	-HxCDD	ng/L (extract)	All <	0.00617	All <	NA	NA		NA	NC	NC
103	-HpCDD	ng/L (extract)		0.01167	All <	NA	NA		NA	NC	NC
104											
105	Totals: Furans										
106	-TCDF	ng/L (extract)	All <	0.00233	All <	NA	NA		NA	NC	NC
107	-PeCDF	ng/L (extract)	All <	0.00400	All <	NA	NA		NA	NC	NC
108	-HxCDF	ng/L (extract)		0.01100	All <	NA	NA		NA	NC	NC
109	-HpCDF	ng/L (extract)		0.00925	All <	NA	NA		NA	NC	NC
110											
111											
112	PCBs (TCLP)										
113											
114	PCBs:	ug/L (extract)				NA	NA		NA		
115	2-Mono	ug/L (extract)		0.02603	All <	NA	NA		NA	NC	NC
116	44'-Di	ug/L (extract)		0.00342	All <	NA	NA		NA	NC	NC
117	244'-Tri	ug/L (extract)		0.00583	All <	NA	NA		NA	NC	NC
118	22'55'-Tetra	ug/L (extract)		0.00307	All <	NA	NA		NA	NC	NC
119	33'44'-Tetra	ug/L (extract)		0.00024	All <	NA	NA		NA	NC	NC
120	2344'5-Penta	ug/L (extract)		0.00012	All <	NA	NA		NA	NC	NC
121	233'44'-Penta	ug/L (extract)		0.00106	All <	NA	NA		NA	NC	NC
122	33'44'5-Penta	ug/L (extract)	All <	0.00004	All <	NA	NA		NA	NC	NC
123	233'44'5-Hexa	ug/L (extract)		0.00031	All <	NA	NA		NA	NC	NC
124	33'44'55'-Hexa	ug/L (extract)	All <	0.00006	All <	NA	NA		NA	NC	NC
125	22'344'55'-Hepta	ug/L (extract)		0.00194	All <	NA	NA		NA	NC	NC
126	22'33'44'55'-Octa	ug/L (extract)		0.00039	All <	NA	NA		NA	NC	NC
127	22'33'44'55'6-Nona	ug/L (extract)	All <	0.00019	All <	NA	NA		NA	NC	NC
128	Deca	ug/L (extract)	All <	0.00014	All <	NA	NA		NA	NC	NC
129											

	A	B	C	D	E	F	G	H	I	J	K
1							TABLE C-1				
2						DIRECT SOLFIX PROCESS PERFORMANCE					
3											
4	Gross Physico-Chemical Properties					solid block	solid block				
5			Raw	Raw							
6			Sediment	Sediment	Comment					Amount	%
7	Analyte	Units	Comment	Mean	SO:LFIX	ME-21	ME-22	n	Mean	Change	Change
130	PCB Totals:										
131	-Mono	ug/L (extract)		0.03497	All <	NA	NA		NA	NC	NC
132	-Di	ug/L (extract)		0.03523	All <	NA	NA		NA	NC	NC
133	-Tri	ug/L (extract)		0.03662	All <	NA	NA		NA	NC	NC
134	-Tetra	ug/L (extract)		0.02352	All <	NA	NA		NA	NC	NC
135	-Penta	ug/L (extract)		0.01562	All <	NA	NA		NA	NC	NC
136	-Hexa	ug/L (extract)		0.01230	All <	NA	NA		NA	NC	NC
137	-Hepta	ug/L (extract)		0.00602	All <	NA	NA		NA	NC	NC
138	-Octa	ug/L (extract)		0.00150	All <	NA	NA		NA	NC	NC
139	-Nona	ug/L (extract)	All <	0.00022	All <	NA	NA		NA	NC	NC
140											
141	NA = Not applicable or Not Available										
142	NC = Cannot be calculated because (1) two values are inequalities, or (2) at least one value is rejected or not available.										

A	B	C	D	E	F	G	H	I	J	K
						TABLE C-2				
					ORG-X AND SOLFIX PROCESS PERFORMANCE					
Gross Physico-Chemical Properties					solid block	solid block				
		Raw	Raw	ORG-X/						
		Sediment	Sediment	SOLFIX					Amount	%
Analyte	Units	Comment	Mean	Comment	ME-10	ME-11	n	Mean	Change	Change
Metals (TCLP)										
-Arsenic	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-Barium	mg/L (extract)	All <	0.50000	All <	0.5000	0.5000	2	NA	NC	NC
-Cadmium	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	NA	NC	NC
-Chromium	mg/L (extract)		0.02833	All <	0.0200	0.0100	2	0.01500	0.01	>47.05
-Lead	mg/L (extract)	All <	0.05000	All <	0.0500	0.0500	2	NA	NC	NC
-Mercury	mg/L (extract)	All <	0.00100	All <	0.0010	0.0010	2	NA	NC	NC
-Selenium	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-Silver	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	NA	NC	NC
Organo-Cl Pesticides (TCLP)										
-Chlordane	mg/L (extract)	All <	0.00500	All <	0.0050	0.0050	2	NA	NC	NC
-Endrin	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	NA	NC	NC
-Heptachlor	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	NA	NC	NC
-Heptachlor epoxide	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	NA	NC	NC
-Lindane (g-BHC)	mg/L (extract)	All <	0.00050	All <	0.0005	0.0005	2	NA	NC	NC
-Methoxychlor	mg/L (extract)	All <	0.00100	All <	0.0010	0.0010	2	NA	NC	NC
-Toxaphene	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	NA	NC	NC
Cl Herbicides (TCLP)										
-2,4-D	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-2,4,5-TP (Silvex)	mg/L (extract)	All <	0.01000	All <	0.0100	0.0100	2	NA	NC	NC
Volatilve Organics (TCLP)										
-Benzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
-Carbon tetrachloride	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
-Chlorobenzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
-Chloroform	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
-1,4-Dichlorobenzene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
-1,2-Dichloroethane	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
-1,1-Dichloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
Methyl ethyl ketone	mg/L (extract)	All <	5.00000	All <	5.0000	5.0000	2	NA	NC	NC
Tetrachloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
Trichloroethene	mg/L (extract)	All <	0.20000	All <	0.2000	0.2000	2	NA	NC	NC
Vinyl chloride	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
Semi-Volatiles (TCLP)										
-Hexachloroethane	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-Nitrobenzene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-Hexachlorobutadiene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-2,4-Dinitrotoluene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-Hexachlorobenzene	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-2,4,6-Trichlorophenol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-2,4,5-Trichlorophenol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-Pentachlorophenol	mg/L (extract)	All <	0.25000	All <	0.2500	0.2500	2	NA	NC	NC
-Pyridine	mg/L (extract)	All <	0.25000	All <	0.2500	0.2500	2	NA	NC	NC
-o-Cresol	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-m,p-Cresols	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
-Total Cresols	mg/L (extract)	All <	0.10000	All <	0.1000	0.1000	2	NA	NC	NC
PAHs (TCLP)										
Naphthalene	mg/L (extract)	All <	0.10000	All <	0.0600	0.0600	2	NA	NC	NC
2-Methylnaphthalene	mg/L (extract)	All <	0.10000	All <	0.0800	0.0800	2	NA	NC	NC
Acenapthylene	mg/L (extract)	All <	0.10000	All <	0.0300	0.0300	2	NA	NC	NC
Acenaphthene	mg/L (extract)	All <	0.10000	All <	0.0300	0.0300	2	NA	NC	NC
Dibenzofuran	mg/L (extract)	All <	0.10000	All <	0.0200	0.0200	2	NA	NC	NC
Fluorene	mg/L (extract)	All <	0.10000	All <	0.0200	0.0200	2	NA	NC	NC
Phenanthrene	mg/L (extract)	All <	0.10000	All <	0.0200	0.0200	2	NA	NC	NC
Anthracene	mg/L (extract)	All <	0.10000	All <	0.0200	0.0200	2	NA	NC	NC
Fluoranthene	mg/L (extract)	All <	0.10000	All <	0.0200	0.0200	2	NA	NC	NC
Pyrene	mg/L (extract)	All <	0.10000	All <	0.0300	0.0300	2	NA	NC	NC
Benzo(a)anthracene	mg/L (extract)	All <	0.10000	All <	1.0000	1.0000	2	NA	NC	NC
Chrysene	mg/L (extract)	All <	0.10000	All <	1.0000	1.0000	2	NA	NC	NC
Benzo(b)fluoranthene	mg/L (extract)	All <	0.10000	All <	1.0000	1.0000	2	NA	NC	NC
Benzo(k)fluoranthene	mg/L (extract)	All <	0.10000	All <	1.0000	1.0000	2	NA	NC	NC
Benzo(a)pyrene	mg/L (extract)	All <	0.10000	All <	1.0000	1.0000	2	NA	NC	NC
Indeno(123-cd)pyrene	mg/L (extract)	All <	0.10000	All <	1.0000	1.0000	2	NA	NC	NC
Dibenz(a,h)anthracene	mg/L (extract)	All <	0.10000	All <	1.0000	1.0000	2	NA	NC	NC
Benzo(ghi)perylene	mg/L (extract)	All <	0.10000	All <	1.0000	1.0000	2	NA	NC	NC
Dioxins/Furans (TCLP)										
2378-TCDD	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
12378-PeCDD	ng/L (extract)	All <	0.00717	All <	NA	NA		NA	NC	NC
123478-HxCDD	ng/L (extract)	All <	0.00700	All <	NA	NA		NA	NC	NC

	A	B	C	D	E	F	G	H	I	J	K
1							TABLE C-2				
2						ORG-X AND SOLFIX PROCESS PERFORMANCE					
3											
4	Gross Physico-Chemical Properties					solid block	solid block				
5			Raw	Raw	ORG-X/						
6			Sediment	Sediment	SOLFIX					Amount	%
7	Analyte	Units	Comment	Mean	Comment	ME-10	ME-11	n	Mean	Change	Change
83	123678-HxCDD	ng/L (extract)	All <	0.00600	All <	NA	NA		NA	NC	NC
84	123789-HxCDD	ng/L (extract)	All <	0.00617	All <	NA	NA		NA	NC	NC
85	1234678-HpCDD	ng/L (extract)		0.00867	All <	NA	NA		NA	NC	NC
86	OCDD	ng/L (extract)		0.03033	All <	NA	NA		NA	NC	NC
87											
88	2378-TCDF	ng/L (extract)	All <	0.00233	All <	NA	NA		NA	NC	NC
89	12378-PeCDF	ng/L (extract)	All <	0.00417	All <	NA	NA		NA	NC	NC
90	23478-PeCDF	ng/L (extract)	All <	0.00400	All <	NA	NA		NA	NC	NC
91	123478-HxCDF	ng/L (extract)		0.00533	All <	NA	NA		NA	NC	NC
92	123678-HxCDF	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
93	234678-HxCDF	ng/L (extract)		0.00467	All <	NA	NA		NA	NC	NC
94	123789-HxCDF	ng/L (extract)	All <	0.00467	All <	NA	NA		NA	NC	NC
95	1234678-HpCDF	ng/L (extract)		0.00925	All <	NA	NA		NA	NC	NC
96	1234789-HpCDF	ng/L (extract)	All <	0.00650	All <	NA	NA		NA	NC	NC
97	OCDF	ng/L (extract)	All <	0.00883	All <	NA	NA		NA	NC	NC
98											

A	A	B	C	D	E	F	G	H	I	J	K
1							TABLE C-2				
2						ORG-X AND SOLFIX PROCESS PERFORMANCE					
3											
4	Gross Physico-Chemical Properties					solid block	solid block				
5			Raw	Raw	ORG-X/						
6			Sediment	Sediment	SOLFIX					Amount	%
7	Analyte	Units	Comment	Mean	Comment	ME-10	ME-11	n	Mean	Change	Change
99	Totals: Dioxins										
100	-TCDD	ng/L (extract)	All <	0.00317	All <	NA	NA		NA	NC	NC
101	-PeCDD	ng/L (extract)	All <	0.00717	All <	NA	NA		NA	NC	NC
102	-HxCDD	ng/L (extract)	All <	0.00617	All <	NA	NA		NA	NC	NC
103	-HpCDD	ng/L (extract)		0.01167	All <	NA	NA		NA	NC	NC
104											
105	Totals: Furans										
106	-TCDF	ng/L (extract)	All <	0.00233	All <	NA	NA		NA	NC	NC
107	-PeCDF	ng/L (extract)	All <	0.00400	All <	NA	NA		NA	NC	NC
108	-HxCDF	ng/L (extract)		0.01100	All <	NA	NA		NA	NC	NC
109	-HpCDF	ng/L (extract)		0.00925	All <	NA	NA		NA	NC	NC
110											
111											
112	PCBs (TCLP)										
113											
114	PCBs:	ug/L (extract)									
115	2-Mono	ug/L (extract)		0.02603	All <	NA	NA		NA	NC	NC
116	44'-Di	ug/L (extract)		0.00342	All <	NA	NA		NA	NC	NC
117	244'-Tri	ug/L (extract)		0.00583		NA	NA		NA	NC	NC
118	22'55'-Tetra	ug/L (extract)		0.00307	All <	NA	NA		NA	NC	NC
119	33'44'-Tetra	ug/L (extract)		0.00024	All <	NA	NA		NA	NC	NC
120	2344'5-Penta	ug/L (extract)		0.00012	All <	NA	NA		NA	NC	NC
121	233'44'-Penta	ug/L (extract)		0.00106	All <	NA	NA		NA	NC	NC
122	33'44'5-Penta	ug/L (extract)	All <	0.00004	All <	NA	NA		NA	NC	NC
123	233'44'5-Hexa	ug/L (extract)		0.00031	All <	NA	NA		NA	NC	NC
124	33'44'55'-Hexa	ug/L (extract)	All <	0.00006	All <	NA	NA		NA	NC	NC
125	22'344'55'-Hepta	ug/L (extract)		0.00194	All <	NA	NA		NA	NC	NC
126	22'33'44'55'-Octa	ug/L (extract)		0.00039	All <	NA	NA		NA	NC	NC
127	22'33'44'55'6-Nona	ug/L (extract)	All <	0.00019	All <	NA	NA		NA	NC	NC
128	Deca	ug/L (extract)	All <	0.00014	All <	NA	NA		NA	NC	NC
129											
130	PCB Totals:										
131	-Mono	ug/L (extract)		0.03497	All <	NA	NA		NA	NC	NC
132	-Di	ug/L (extract)		0.03523	All <	NA	NA		NA	NC	NC
133	-Tri	ug/L (extract)		0.03662		NA	NA		NA	NC	NC
134	-Tetra	ug/L (extract)		0.02352		NA	NA		NA	NC	NC
135	-Penta	ug/L (extract)		0.01562		NA	NA		NA	NC	NC
136	-Hexa	ug/L (extract)		0.01230	All <	NA	NA		NA	NC	NC
137	-Hepta	ug/L (extract)		0.00602	All <	NA	NA		NA	NC	NC
138	-Octa	ug/L (extract)		0.00150	All <	NA	NA		NA	NC	NC
139	-Nona	ug/L (extract)	All <	0.00022	All <	NA	NA		NA	NC	NC
140											
141	NA = Not Applicable or Not Available.										
142	NC = Cannot be calculated because: (1) two values are inequalities or (2) at least one value is rejected or not available.										