Appendix H

Dredged Material Management Assessments

MALCOLM PIRNIE

Interoffice Correspondence

Date: April 6, 2007

To: L. Bossi (WHI)

Copy: S. Thompson (WHI), B. Fidler (NNJ)

From: A. Nolan (MOB)

Re: Waste Characterization Assessment

On-site Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial actions must comply with (or waive) requirements of the Resource Conservation and Recovery Act (RCRA) that are determined to be applicable or relevant and appropriate requirements (ARARs). For RCRA Subtitle C hazardous waste requirements to be applicable, the CERCLA response action must constitute treatment, storage, transport, or disposal of a RCRA hazardous waste. The United States Environmental Protection Agency (USEPA) generally considers contaminated environmental media (such as sediments) to contain hazardous waste: when they exhibit a characteristic of hazardous waste, or when they are contaminated with concentrations of hazardous constituents from listed hazardous waste that are above health-based levels.

The USEPA has determined that the sediments from the Lower Passaic River do not contain a listed hazardous waste. Thus, the purpose of this memorandum is to present the methodology and results of an analysis to determine whether sediment from the Lower Passaic River could be classified as a characteristic waste due to toxicity as defined through the Toxicity Characteristic Leaching Procedure (TCLP).

METHODOLOGY

For purposes of RCRA regulations, a solid waste exhibits the characteristic of toxicity if the extract (Method 1311) from a representative waste sample contains any of the contaminants listed in the 40 CFR 261.24 (Table 1) at concentrations equal to or greater than the reported value. Section 1.2 of the TCLP procedure (Method 1311) allows for a

total constituent analysis in lieu of the TCLP extraction. The results of the total constituent analysis may be divided by 20 to convert the total results into the maximum leachable concentration. This factor is derived from the 20:1 liquid-to-solid ratio employed in the TCL method. If the maximum theoretical leachate concentrations are less than the applicable limits under 40 CFR 261.24, then the waste does not exhibit the toxicity characteristic (TC) and the TCLP analysis does not need to be performed. Alternatively, if the total waste analysis data yield a maximum theoretical leachate concentration that equals or exceeds the TC threshold, the data cannot be used to demonstrate conclusively that the waste does not exceed the TC.

The data used for this analysis include samples from the historical sediment cores collected in 1991, 1993, and 1995. Only the data for contaminants listed in 40 CFR 261.24 were used for this comparison. The sample data were compared to the associated threshold TCLP concentrations listed in 40 CFR 261.24 to determine if the individual samples exhibit RCRA TC. The following procedure was used to calculate the percentage of samples that exceed the TCLP concentrations (Table 1):

- The maximum concentration of each analyte was divided by 20 (herein expressed as "Max/20").
- The Max/20 result was compared to the TCLP threshold for each analyte.
- If the Max/20 did not exceed the TCLP threshold, then none of the sediment samples exceed the TCLP threshold for that analyte.
- If the Max/20 exceeded the TCLP threshold, then all concentrations for that analyte were divided by 20 (herein expressed as "Concentration/20").
- The number of times the Concentration/20 exceeded the TCLP was calculated for each analyte.
- The exceedance count was divided by the total sample count to determine the "Exceedance Percentage" for each analyte.

Table 1: Toxicity Characterization Analysis Results

Contaminant	TCLP Threshold (mg/L)	Max/20 (mg/kg)	Sample Count	Exceedance Count	Exceedance Percentage
1,1-Dichloroethylene	0.7	0.0014	648	0	0
1,2-Dichloroethane	0.5	0	648	0	0
1,4-Dichlorobenzene	7.5	10500	748	19	2.5
2,4,5-TP (Silvex)	1	0.0308	569	0	0
2,4,5-Trichlorophenol	400	41.5	739	0	0
2,4,6-Trichlorophenol	2	17	739	1	0.14
2,4-D	10	32.3	567	1	0.18
2,4-Dinitrotoluene	0.13	0.5	737	1	0.14
4-Methylphenol (p-Cresol)	200	0.315	739	0	0
Arsenic	5	235	755	11	1.5
Barium	100	66.5	740	0	0
Benzene	0.5	0.165	648	0	0
BHC, gamma (Lindane)	0.4	0.00184	713	0	0
Cadmium	1	2.27	768	97	13
Carbon tetrachloride	0.5	0	648	0	0
Chlordane	0.03	0.03955	698	1	0.14
Chlorobenzene	100	14.5	648	0	0
Chloroform	6	0	648	0	0
Chromium	5	108	768	558	73
Endrin	0.02	0.083	713	2	0.28
Heptachlor (and its epoxide)	0.008	0.00022	715	0	0
Hexachlorobenzene	0.13	29	756	5	0.66
Hexachlorobutadiene	0.5	0.0335	747	0	0
Hexachloroethane	3	0.0345	736	0	0
Lead	5	1100	715	590	83
Mercury	0.2	1.48	760	401	53
Methoxychlor	10	0.0273	677	0	0
Methyl ethyl ketone	200	0.15	637	0	0
Nitrobenzene	2	0	736	0	0
o-Cresol	200	0	738	0	0
Selenium	1	4.13	680	1	0.15
Silver	5	1.335	722	0	0
Tetrachloroethylene	0.7	0.012	648	0	0
Toxaphene	0.5	0.055	694	0	0
Trichloroethylene	0.5	0.00255	648	0	0
Vinyl chloride	0.2	0.00245	648	0	0
Cresol	200	0	0	0	0
m-Cresol	200	0	0	0	0
Pentachlorophenol	100	0.65	736	0	0
Pyridine	5	0		0	0

RESULTS

Samples for 13 contaminants could theoretically be determined to exceed the RCRA TC thresholds. Table 2 presents the percentage of samples containing each analyte at concentrations that could potentially exceed the RCRA TC threshold.

Table 2: Percentage of Samples that Could Exceed TC Thresholds for Various Analytes

Contaminants	Exceedance Percentage
1,4-Dichlorobenzene	2.5
2,4,6-Trichlorophenol	0.14
2,4-D	0.18
2,4-Dinitrotoluene	0.14
Arsenic	1.5
Cadmium	13
Chlordane	0.14
Chromium	73
Endrin	0.28
Hexachlorobenzene	0.66
Lead	83
Mercury	53
Selenium	0.15

CONCLUSIONS

In conclusion, there is a reasonable probability that some sediment from the Lower Passaic River could exceed TC criteria if the TCLP test were performed. In particular, the analytes most likely to exceed the TC thresholds are chromium, lead, and mercury, given their high frequency of exceedance of the Max/20 limit.

MALCOLM PIRNIE

Interoffice Correspondence

Date: March 29, 2007

To: L. Bossi (WHI)

Copy: S. Thompson (WHI), B. Fidler (WHI)

From: J. Perry (NNJ)

Re: Off-Site Disposal Facilities

Remedial alternatives involving dredging of the Lower Passaic River may result in several waste streams requiring off-site disposal. This memorandum presents the results of a preliminary survey of existing off-site disposal facilities that could potentially accept dredged debris and sediment from the Lower Passaic River. The survey focused on local disposal facilities (*i.e.*, facilities located in New Jersey, New York, and Connecticut); however, the survey boundaries were extended for hazardous wastes when local disposal options are limited. This preliminary survey does not represent the full range of options that may be available for disposal of these waste streams (*e.g.*, beneficial uses such as construction fill, or landfill daily cover, *etc*.). The purpose here is only to list readily available off-site disposal options, such as landfills and incinerators. Table 1 below summarizes the types of dredged material waste streams that could be generated and the corresponding types of facilities that could potentially accept these wastes.

Table 1: Dredged Material Waste Streams and Potentially Applicable Disposable Facilities

Type of Waste	Disposal Facility
Hazardous waste[a] sediment with concentrations above land ban[b] regulation levels	Hazardous waste incinerator
Hazardous waste sediment with concentrations below land ban regulation levels	Subtitle C (hazardous waste)[c] landfill, hazardous waste incinerator
Contaminated non-hazardous waste sediment	Subtitle D (municipal solid waste)[d] landfill, municipal solid waste incinerator
Contaminated debris (hazardous)	Subtitle C landfill
Decontaminated or non-contaminated debris (non-hazardous)	Subtitle D landfill, recycling facility, construction and demolition landfill, municipal solid waste incinerator

a: "Hazardous waste" defined in 40 CFR 261.
b: Land ban regulations are provided in 40 CFR 268 RCRA.
c: Subtitle C landfills regulations are provided in 40 CFR 264 RCRA.
d: Subtitle D landfill regulations are provided in 40 CFR 258.

Table 2 and Table 3 (attached) list the locations of United States Subtitle C hazardous waste incinerators and landfills, respectively. These data are based upon reports generated by *Environmental Heath and Safety Online* (http://www.ehso.com). Table 4 (attached) lists locations of municipal solid waste incinerators in New Jersey and New York. Only facilities with current permits are listed. In addition to these facilities, a total of 143 solid waste landfill sites in Connecticut (24 landfills), New Jersey (46 landfills), and New York (73 landfills) were identified. These landfills varied among construction and demolition landfills, industrial landfills, municipal solid waste landfills, commercial sanitary landfills, and private sanitary landfills. In New Jersey, 102 Class B recycling facilities were also identified.[1]

Transport of any dredged material to these facilities would require generation of a detailed waste profile and additional inquiries to each facility to confirm that the waste profile meets permit and capacity requirements.

[1] "Class B recyclable material" means a source separated recyclable material which is subject to NJDEP approval prior to receipt, storage, processing or transfer at a recycling center in accordance with N.J.S.A. 13:1E-99.34b, and which includes, but is not limited to, the following:

(a) Source separated, non-putrescible, waste concrete, asphalt, brick, block, asphalt-based roofing scrap and wood waste.
(b) Source separated, non-putrescible, waste materials other than metal, glass, paper, plastic containers, corrugated and other cardboard resulting from construction, remodeling, repair and demolition operations on houses, commercial buildings, pavements and other structures.
(c) Source separated whole trees, tree trunks, tree parts, tree stumps, brush and leaves provided that they are not composted.
(d) Source separated scrap tires.
(e) Source separated petroleum contaminated soil.

TABLE 2: HAZARDOUS WASTE INCINERATORS IN THE UNITED STATES

Facility	City and State	Toxic Substances Control Act (TSCA) Permit	Notes	Source of Notes
Aptus (now Clean Harbors)	West Aragon, UT	Information not provided.		
Chemical Waste Management (now Onyx)	Port Arthur, TX	Yes	Capacity of 400 tons/day	Veolia/Onyx website
Chemical Waste Management (now Onyx)	Sauget, IL	No		
Clean Harbors of Braintree, Inc.	Braintree, MA	Information not provided.	No longer in operation	Clean Harbors website
Clean Harbors Technology Corporation	Kimball, NE	Information not provided.		
Diversified Scientific Services, Inc. (DSSI) (now Perma-Fix)	Kingston, TN	No		
Environmental Services Company (ENSCO)	Dalton, GA	Information not provided.		
Environmental Services Company (ENSCO) (now Clean Harbors)	El Dorado, AR	Information not provided.		
ICI Explosives Environmental	Joplin, MO	No		
Laidlaw Environmental Services (now Clean Harbors)	Bridgeport, NJ	No		
Laidlaw Environmental Services (now Clean Harbors)	Clarence, NY	No		
Laidlaw Environmental Services (now Clean Harbors)	Coffeyville, KS	Yes	No longer in operation	Clean Harbors representative (March 2006)
Laidlaw Environmental Services (now Clean Harbors)	Deer Park, TX	Yes	Capacity of 250 tons/day	Clean Harbors representative (March 2006)
Laidlaw Environmental Services (now Clean Harbors)	Roebuck, SC	No	No longer in operation	
LWD, Inc.	Calvert, KY	No		
Reynolds Metal Company	Arkadelphia, AR	No		
Rhone-Poulenc Basic Chemical Company	Baton Rouge, LA	No		
Rhone-Poulenc Basic Chemical Company	Hammond, IN	No		
Rhone-Poulenc Basic Chemical Company	Houston, TX	Information not provided.		
Ross Environmental Services	Grafton, OH	Information not provided.		
Thermal Kem	Rock Hill, SC	Information not provided.	No longer in operation	http://www.scelp.org/cases.php?show=1
WRR Environmental Services Corporation.	Eau Claire, WI	No		

Source: Environmental Health and Safety Online (http://www.ehso.com/cssepa/tsdfincin.php; date of information is not noted)

TABLE 3: HAZARDOUS WASTE LANDFILLS IN THE UNITED STATES

Facility	City and State	Toxic Substances Control Act (TSCA) Permit	Notes
Chemical Waste Management	Arlington, OR	Yes	
Chemical Waste Management	Carlyss, LA	No	No PCDD/F
Chemical Waste Management	Emelle, AL	Yes	
Chemical Waste Management	Fort Wayne, IN	Information not provided.	
Chemical Waste Management	Kettleman City, CA	Information not provided.	
Chemical Waste Management	Model City, NY	Yes	
EnviroSafe Services of Idaho	Grandview, ID	Yes	
EnviroSafe Services of Ohio	Oregon, OH	Information not provided.	
Laidlaw Environmental Services (now Clean Harbors)	Buttonwillow, CA	No	
Laidlaw Environmental Services (now Clean Harbors)	Deer Park, TX	Yes	
Laidlaw Environmental Services (now Clean Harbors)	Deer Trail, CO	Information not provided.	No PCDD/F >1 ppb
Laidlaw Environmental Services (now Clean Harbors)	Lake Point, UT	Information not provided.	
Laidlaw Environmental Services (now Clean Harbors)	Pinewood, SC	No	
Laidlaw Environmental Services (now Clean Harbors)	Waynoka, OK	Information not provided.	
Laidlaw Environmental Services (now Clean Harbors)	Westmorland, CA	Information not provided.	
MAX Environmental Technologies	Pittsburgh, PA	No	
Peoria Disposal	Peoria, IL	No	
Texas Ecologists	Robstown, TX	No	
United States Ecology	Beatty, NV	Yes	
Waste Control Specialists	Andrews, TX	Yes	Accepts PCDD/F waste
Wayne Disposal, Inc.	Belleville, MI	Yes	

Source: Environmental Health and Safety Online (http://www.ehso.com/cssepa/tsdflandfills.php; date of information is not noted)

PCDD/F = polychlorinated dibenzodioxins/furans
ppb = parts per billion

TABLE 4: MUNICIPAL SOLID WASTE INCINERATORS IN NEW JERSEY AND NEW YORK

FACILITY/LOCATION	COUNTY	FACILITY ID	WASTE TYPE	CAPACITY	PERMIT ISSUED	PERMIT EXPIRES	SOURCE
Essex County RRF Newark, NJ	Essex	133546	10,23,27	985,500 TPY	8/16/2006	8/16/2011	http://www.nj.gov/dep/dshw/rrtp/njaincin.htm
Union County RRF Rahway, NJ	Union	1332721	10,25,27	562100 TPY	11/18/2004	2/21/2007	http://www.nj.gov/dep/dshw/rrtp/njaincin.htm
Babylon RRF, West Babylon, NY	Suffolk	N/A	Residential, Commerical	Not provided	5/31/2004	5/31/2009	http://www.dec.state.ny.us/website/dshm/sldwaste/facilities/wtelist.pdf
Islip MacArthur Waste-to-Energy Facility, Ronkonkoma, NY	Suffolk	N/A	Residential, Commerical, Treated RMW	Not provided	11/5/2004	11/4/2009	http://www.dec.state.ny.us/website/dshm/sldwaste/facilities/wtelist.pdf
Wheelabrator Hudson Falls, Hudson Falls, NY	Washington	N/A	Residential, Commerical, Waste Tires	Not provided	Not Provided	5/30/2010	http://www.dec.state.ny.us/website/dshm/sldwaste/facilities/wtelist.pdf
Onondaga County Resource Recovery Facility, Jamesville, NY	Onondaga	N/A	Residential, Commerical, Construction and Demolition Debris	Not provided	11/16/2001	11/16/2011	http://www.dec.state.ny.us/website/dshm/sldwaste/facilities/wtelist.pdf
Oswego County Energy Recovery Facility, Fulton, NY	Oswego	N/A	Residential, Commerical	Not provided	7/28/2004	7/28/2014	http://www.dec.state.ny.us/website/dshm/sldwaste/facilities/wtelist.pdf
Covanta Niagara, L.P., Niagara Falls, NY	Niagara	N/A	Residential, Commerical, Construction and Demolition Debris, Industrial	Not provided	4/1/2005	3/31/2015	http://www.dec.state.ny.us/website/dshm/sldwaste/facilities/wtelist.pdf

Notes:
NJ Waste ID 10 = Municipal waste
NJ Waste ID 23 = Vegetative waste
NJ Waste ID 25 = Animal and food processing waste
NJ Waste ID 27 = Dry industrial waste

RMW = regulated medical waste
RRF = resource recovery facility
TPY = tons per year

MALCOLM PIRNIE

Interoffice Correspondence

Date: March 29, 2007
To: L. Bossi (WHI)
Copy: S. Thompson (WHI), B. Fidler (NNJ)
From: D. Lewitt (WHI)
Re: Upland Processing and Placement Facility Siting Study

A screening survey was conducted by New Jersey Department of Environmental Protection (NJDEP) to determine whether any sites exist that could be candidates for the development of either a processing facility or placement site to handle dredged material from the Lower Passaic River. The extent of the survey covered a 15 mile radius around the Harrison Reach [approximately river mile (RM) 2.5 to RM4.6] of the Lower Passaic River under the assumption that dredging activities would be centralized around this location. The survey area includes heavily industrialized inland and waterfront areas around Newark Bay, Lower Passaic River, Hackensack River, Arthur Kill, and Kill Van Kull.

Factors influencing identification of potential candidates included site accessibility and land use. Waterborne, rail, and road access were evaluated for each candidate site, including presence of piers/bulkheads, water depths, paved roads, proximity to major highways, and distance to rail lines or spurs. Land use considerations included the existence of vacant lots, open space, and degree of development. Other considerations included confirmation of loading/docking facilities, nearby bridge heights, and location of residential areas.

A total of 87 locations that could be potential placement or processing sites were identified within the extent of the survey. Table 1 summarizes the site characteristics by acreage of visible available land. Table 2 summarizes the site characteristics by distance in river miles from the Diamond Alkali Superfund Site (Operable Unit 1), which is

located at RM3.1. In addition, both tables summarize available modes of transportation and site access.

Table 1: Summary of Potential Placement/Processing Sites by Acreage

Sites		Access [a]		
Area (Land acres)	Total Number of Sites	Sites with Waterfront Access	Sites with Rail Access	Sites with Road Access
<10	18	13	3	16
10 – 20	17	11	6	17
20 – 30	17	9	7	16
30 – 50	16	9	5	13
50 – 100	6	4	1	6
100 – 200	11	10	7	9
>200	2	2	1	2
TOTAL	**87**	**58**	**30**	**79**

a: Sites can be grouped into more than one category.

Table 2: Summary of Potential Placement/Processing Sites with Waterfront Access by Distance

Sites		Access [a]		
Distance (river mile)[b]	Total Number of Sites	Sites with Waterfront Access	Sites with Rail Access	Sites with Road Access
<2	14	14	2	13
2 – 5	15	15	2	15
5 – 10	11	11	4	10
>10	18	18	8	17
TOTAL	**58**	**58**	**16**	**55**

a: Sites can be grouped into more than one category.
b: Approximate distance measured from the Diamond Alkali Superfund Site (Operable Unit 1)

The majority of identified sites were under 30 acres in size and less than 10 river miles from the Diamond Alkali Site. However, 19 large (greater than 50 acres) sites were also identified. Of these large sites, 8 sites are within 10 miles of the Harrison Reach. Sixty-seven percent of the total sites had waterfront access to allow for barges or scows, although bulkheading and/or dredging activities would likely be required at many locations. Rail and road access were identified at 34 and 91 percent of the sites, respectively. A total of 58 sites have waterfront access. Of these waterfront access sites, 16 have rail access and 55 have road access as well.

In conclusion, several candidate sites exists that could be considered suitable sites for processing or placement sites based on adequate size and being within an acceptable distance of the Lower Passaic River. These results are being used to confirm in general

the feasibility of the dredging alternatives. However, since this screening survey did not extend to identification of land ownership or confirmation of future development plans, its results are not useable for actual siting of processing or placement sites. Actual siting will need to be conducted during the future design phase.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: April 11, 2007

SUBJECT: Sediment Decontamination Full-scale Demonstration Treatability Studies – lower Passaic River, NJ
Technical Memoranda:
BioGenesis Enterprises / Gas Technology Institute – Endesco Clean Harbors

FROM: Eric A. Stern – DEPP/DMMT
Regional Contaminated Sediment Program Manager
NY/NJ Harbor Sediment Decontamination Program

TO: Alice Yeh - ERRD
Remedial Project Manager
Passaic River Restoration Study

Please find attached Technical Memoranda prepared by BioGenesis Enterprises, Inc and Gas Technology Institute / Endesco Clean Harbors (ECH). Both BioGenesis and GTI / ECH participated in the lower Passaic River Restoration Sediment Decontamination Treatability Study. These memoranda have been developed for consideration / inclusion as part of the Passaic River Focused Feasibility Study. These memoranda should be considered as a first preliminary interpretation of results from the 2006-2007 testing efforts. Data is still undergoing QA/QC validation. Furthermore, GTI will be conducting another demonstration test in May 2007. BioGenesis, GTI, EPA, NJDOT Office of Maritime Resources, and Brookhaven National Laboratory will be meeting shortly to start the interpretive evaluation process.

If you have any questions regarding these studies, please contact me at 212.637.3806 / stern.eric@epa.gov .

CC: Douglas Pabst - EPA
Keith Jones – BNL
Scott Douglas – NJDOT
Michael Mensinger – GTI
John Sontag - BioGenesis

TECHNICAL MEMORANDUM
on the
BIOGENESIS^{SM} SEDIMENT WASHING DEMONSTRATION PROJECT
in support of
THE LOWER PASSAIC RIVER RESTORATION PROJECT

Prepared by: BioGenesis Enterprises, Inc.
June 1, 2007

Introduction

During 2005/2006 BioGenesis Washing BGW, LLC conducted a full-scale demonstration project of the BioGenesis^{SM} Sediment Washing Technology in the New York/New Jersey Harbor. The main purposes of the demonstration project were to confirm the ability of the BioGenesis^{SM} process to treat contaminated sediments to levels acceptable for beneficial use and to develop commercial scale operational and cost data. Currently, BioGenesis is in the process of evaluating the data collected during the demonstration project and preparing the final report.

The demonstration project is being conducted under contract to the New Jersey Department of Transportation, Office of Maritime Resources (NJDOT/OMR) under the State of New Jersey's Sediment Decontamination Technology Demonstration Program in coordination with the U.S. Environmental Protection Agency (EPA) under the Water Resources Development Act (WRDA).

The USEPA and NJDOT have partnered along with the U.S. Army Corps of Engineers New York District and the New Jersey Department of Environmental Protection (NJDEP) to perform a joint study to cleanup and restore the Lower Passaic River. As part of that work, a Focused Feasibility Study is being prepared to evaluate interim remedial options for the Lower Passaic River. This Technical Memorandum discusses a small portion of the overall aspects of the demonstration project and has been prepared to provide interim information to the federal/state Lower Passaic River Restoration group for the preparation of the Focused Feasibility Study Report while the final report is being completed. This Technical Memorandum should be considered DRAFT and will be replaced by the Final Report when it is completed.

BioGenesis^{SM} Sediment Washing Technology

The BioGenesis^{SM} Sediment Decontamination Technology is a patented low temperature decontamination process for fine-grained sediment, which uses impact forces and propriety chemicals to remove organic and inorganic contamination. The resulting decontaminated sediment can be used to produce high-end topsoil or other construction grade products.

The BioGenesis[SM] Sediment Washing Technology consists of seven main processing steps including:

- Material preparation – offloading, screening, storage, and addition of proprietary washing chemicals
- Pre-Processing – disaggregation of the sediment particles from each other and from the loosely-associated naturally occurring organic material (called biomass)
- Application of Collision Impact forces – stripping the biofilm layer and adsorbed contaminants from the solid sediment particles
- Cavitation/Oxidation – destruction of organic contaminants using enhanced oxidation
- Solid/Liquid Separation – recovery of the cleaned sediment particles
- Wastewater Treatment – pre-treatment of the resulting wastewater and discharge to the local publicly owned treatment works
- Soil Manufacturing – blending of the decontaminated sediment with other raw materials to produce a high-end topsoil

Demonstration Project

BioGenesis constructed the temporary full-scale demonstration plant at a facility in Keasbey, New Jersey, in Woodbridge Township, adjacent to the Raritan River. Waterfront facilities were constructed for offloading and material storage. During the demonstration project, dredged material was decontaminated from three sources in the New York/New Jersey Harbor:

Raritan River – approx. 3,540 cyds
Arthur Kill – approx. 8,500 cyds
Lower Passaic River – approx. 2,620 cyds

Dredged material from the Lower Passaic River was offloaded from two delivery scows, screened to remove oversized materials and pumped to a storage vessel for temporary storage. The raw sediment was then pumped from the storage vessel to the preprocessor mix tank in the treatment facility where proprietary specialty chemicals including surfactants, chelating agents, and defoamers were added to prepare the sediment for decontamination by decreasing the affinity among contaminants, sediment solids, and naturally occurring biomass. The sediment was then pumped to the BioGenesis[SM] preprocessor unit where physical action from high-pressure water jets disaggregated the sediment particles from each other and separated the loosely associated material from the biomass-coated particles. The result was that clumped particles were disaggregated and suspended in the aqueous phase and the biomass is fractionated and transferred to the aqueous phase.

Next, collision impact forces were applied to the isolated particles in the BioGenesis[SM] collision chamber to strip the biofilm layer and adsorbed contaminants from the solid sediment particles and transfer them into the aqueous phase.

Following the physical separation of the contaminants from the sediment particles, the organic contaminants and naturally occurring organic biomass that have been segregated from the sediment particles were destroyed using cavitation and oxidation. Hydrogen peroxide, a strong oxidizing agent, was added to the sediment slurry upstream of the BioGenesis[SM] cavitation system. Cavitation occurs when air bubbles created in the slurry implode. The implosion causes instantaneous high pressure and temperature, which in the presence of a strong oxidizing agent, causes organic molecules to break down into carbon dioxide and water. At the conclusion of the BioGenesis[SM] cavitation system, the slurry consists of inorganic sediment particles that have been washed of contaminants, suspended organic biomass containing residual organic and inorganic contaminants, and water that contains the majority of contaminants (mainly inorganic) that have been desorbed from the sediment particles and biomass.

Following the above decontamination steps, the slurry was immediately processed through solid/liquid separation units to segregate the decontaminated solids fraction from the liquid fraction containing the inorganic contaminants and the residual organic contaminants. The solid/liquid separation system included fine mesh scalping screens, hydrocyclones, and a centrifuge. The cleaned sediment solids separated from the aqueous phase were then sampled and stockpiled. The aqueous phase containing the inorganic and organic contaminants was processed through a wastewater treatment system and discharged to the local sewer system.

The stockpiled decontaminated sediment was processed with other raw materials (washed sand and mulch) in the initial step to produce a manufactured topsoil. The resulting material was screened using a trommel screen to ensure a consistent blend was achieved, and the material was stockpiled and sampled. Initial sample results indicated that the material was not a manufactured topsoil because it needed additional coarse material added to it to provide the required structural characteristics of topsoil. This work is planned for the summer of 2007.

Treatment Results

Throughout the demonstration project BioGenesis performed several test runs on the sediment from the Lower Passaic River in preparation for the final run, which was conducted during the 1st week of May 2006. During the initial test runs significant problems were encountered with the sediment plugging in the piping and processing equipment. This was due to an unusually high amount of trash and debris in the Passaic River sediment that was dredged and delivered for the demonstration project. The debris included household trash such as plastic bags, straws, and food wrappers as well as organic debris such as twigs and leaves. This amount of debris would cause blockages in the piping and process equipment and did not allow for consistent uninterrupted operations.

In order to remove this debris a secondary screening step was installed which removed the debris greater than 0.03 inches (#20 mesh size). This secondary screening step drastically improved the ability to operate continuously. Once the secondary screen was installed, several additional test runs were conducted at varying operating conditions to determine the most effective operating scenario. This culminated in the test run conducted on May 2, 3 and 4, 2006. Presented in Tables 1 and 2 attached are the results of samples collected during this confirmatory test run. The sample locations are described on the tables.

The concentrations of metals in the untreated sediment (PSS sample) were below the residential soil criteria for all constituents except lead. Through the washing process, the metal concentrations were reduced (TS sample) and they were further reduced during initial soil manufacturing (MSL sample). Lead concentrations were below the residential soil criteria following sediment washing.

The treatment of chlorinated organics (pesticides, polychlorinated biphenyls (PCBs), and dioxins/furans) was very successful. Pesticide concentrations in the untreated sediment (PSS sample) were low (at or below the residential soil criteria) and these concentrations were reduced following washing (TS sample) and further reduced following initial soil manufacturing (MSL sample). Starting PCB concentrations (PSS sample) were above the residential criteria and were reduced below the criteria during washing (TS sample) and further reduced during the initial soil manufacturing (MSL sample). Dioxin/furan concentrations were reduced by approximately 85% during washing (PSS compared to TS samples) and were further reduced during initial soil manufacturing (MSL sample) for an overall reduction of approximately 94%.

While the overall processing (including initial soil manufacturing) was able to reduce the average concentrations for the polyaromatic hydrocarbons (PAHs) to levels below the residential soil criteria (MSL samples), the PAHs in the Lower Passaic River sediment presented some challenges. In order to determine the distribution of the PAHs in the untreated sediment as well as in the treated sediment, samples were collected at interim steps throughout the processing. The results of the samples (included in the attached tables) indicate that the PAHs are bound (if not integral to) the organic debris (twigs, leaves) dispersed within the sediment matrix. This is evident in the elevated concentrations of PAHs in the material removed from the decks of the secondary screen (with #20 mesh size). In addition, the concentration of the PAHs in the fractions of the treated sediment (TS1, TS2, and TS3 samples) indicates that the PAHs are most prominent in the coarser material which is counterintuitive to the distribution of contaminants on sediment particles. For higher levels of PAHs the untreated sediment would be screened finer to separate more organic debris from the sediment particles prior to processing.

BioGenesis is working with the NJDEP to complete the soil manufacturing phase of the demonstration project. We have enlisted the help of the NJDOT, USEPA, BNL, and a regional university to perform the final manufacturing step to produce a manufactured topsoil which can be used as landscape soil at the university campus for the purpose of long-term monitoring of the manufactured soil. Once the material meets the physical characteristics of a topsoil, it will be sampled to ensure that the topsoil meets the requirements of NJ Residential Direct Contact Cleanup Criteria.

BioGenesis believes that re-arrangement of key system components, as well as further processing steps within the manufactured soil blending process would result in acceptable PAH concentrations to meet RDCSCC. This evaluation is critical especially as it relates to the economic viability of this process.

Projected Full-scale Costs

One of the goals of the demonstration project was to refine the projected capital and operating costs for a commercial-scale facility to be built in the New York/New Jersey Harbor region. These costs will be presented in the final report.

For the purposes of the Lower Passaic River Focused Feasibility Study, treatment costs were estimated for several scenarios depending on the quantity of sediment to be dredged and delivered to a BioGenesis[SM] Sediment Washing Facility. Based on discussions with the Lower Passaic River Restoration team, it was assumed that a dedicated facility would be required for the Lower Passaic River Restoration project, and that a site with offloading and storage facilities would be provided.

Three costing scenarios were considered:

- 50,000 cyd project (to be dredged over the duration of the restoration project)
- 250,000 cyd/year facility to be operated for 1 to 10 years
- 500,000 cyd/year facility to be operated for 1 to 10 years

For the 50,000 cyd project, a temporary facility would be constructed consisting primarily of rental equipment. In order to eliminate rental costs for downtime during dredging, it was assumed that all the dredged material would be delivered at one time or that it would be stored (by others) until the end of the dredging activities so that it could be processed at once. Since the facility would be temporary and constructed with rental equipment, there would be no capital cost. The breakdown for a project like this is:

Estimated Time and Costs for a 50,000 cyd Project

Mobilization/Construction:	$1,450,000
Monthly Operations Cost (~12,000 cyds per month):	$1,496,000
Demobilization:	$ 546,000
50,000 cyd Project (4.2 months):	$ 8,229,300
	$ 164.59/cyd

The breakdown of the capital and operating costs for a permanent facility (250,000 or 500,000 cyds/year) are attached. The following is a summary of the unit costs for these facilities under different operating scenarios:

Total Quantity	Estimated Total Costs and Operating Time for a 250,000 cyd/yr plant		Estimated Total Costs and Operating Time for a 500,000 cyd/yr plant	
250,000 cyds	1 year	$116.13 /cyd	½ year	$151.25 /cyd
500,000 cyds	2 years	$86.59 /cyd	1 year	$101.89 /cyd
1,000,000 cyds	4 years	$71.82 /cyd	2 years	$77.22 /cyd
1,500,000 cyds	6 years	$66.89 /cyd	3 years	$68.99 /cyd
2,000,000 cyds	8 years	$64.43 /cyd	4 years	$64.88 /cyd
2,500,000 cyds	10 years	$62.95 /cyd	5 years	$62.41 /cyd

Estimated Capital and Operating Costs
Commercial-Scale BioGenesis[SM] Sediment Washing Facility
Lower Passaic River Restoration Project

Capital Costs	***250,000 cyds/yr Facility***	***500,000 cyds/yr Facility***
Screening Facilities	$ 214,000	$ 214,000
PreProcessor	$ 100,000	$ 200,000
Water Blasters	$ 576,000	$ 1,146,000
Collision Chamber	$ 540,000	$ 1,080,000
Cav/Ox Facilities	$ 298,800	$ 504,800
Hydrocyclones	$ 219,400	$ 438,800
Centrifuge Facilities	$ 1,250,000	$ 2,500,000
Filter Presses	$ 1,500,000	$ 2,500,000
Wastewater Equalization	$ 90,800	$ 100,800
Floc/Clarification	$ 120,000	$ 225,000
Initial pH Adjustment	$ 27,000	$ 37,000
Filtration Facilities	$ 260,000	$ 510,000
Organics Removal	$ 160,000	$ 160,000
Final pH Adjustment	$ 27,000	$ 37,000
Sludge Processing	$ 309,000	$ 587,000
Chemical Feed Systems	$ 304,960	$ 586,360
Treated Sediment Storage	$ 421,000	$ 811,000
Plant Utility Water	$ 16,000	$ 16,000
Passive Vapor Phase Treatment	$ 600	$ 600
Plant Air Compressor	$ 15,000	$ 30,000
Tanks and Equipment Capital Cost	$ 6,449,560	$ 11,684,360
Equipment Installation (15%)	$ 967,434	$ 1,752,654
Mechanical (20%)	$ 1,289,912	$ 2,336,872
Electrical and Instrumentation (20%)	$ 1,289,912	$ 2,336,872
Installation Cost	$ 3,547,258	$ 6,426,398
Yard Piping	$ 97,000	$ 97,000
Processing Building	$ 2,000,000	$ 2,500,000
Site Preparation	$ 750,000	$ 750,000
Subtotal	$ 12,843,818	$ 21,457,758
Contingency (15%)	$ 1,926,573	$ 3,218,664
Total Capital Cost	***$ 14,770,391***	***$ 24,676,422***

Does not include site, dock, offloading, or upfront storage costs

Estimated Capital and Operating Costs
Commercial-Scale BioGenesis[SM] Sediment Washing Facility
Lower Passaic River Restoration Project
(continued)

Annual Operations Cost		*250,000 cyds/yr Facility*		*500,000 cyds/yr Facility*
Personnel	$	3,447,963	$	5,337,393
Power	$	1,670,400	$	3,340,800
Water	$	233,856	$	467,712
Wastewater Disposal	$	263,088	$	526,176
Solids Disposal	$	652,500	$	1,305,000
Off-spec Solids	$	2,610,000	$	5,220,000
Solid Waste Disposal	$	43,500	$	87,000
Chemical Usage	$	3,500,000	$	7,000,000
Equipment Maintenance (20% Capital Cost)	$	1,289,912.0	$	2,336,872.0
Building Maintenance (20% Building Cost)	$	400,000.0	$	500,000.0
Site Maintenance (20% Site Improvement Co	$	150,000.0	$	150,000.0
Total Annual Operating Costs	***$***	***14,261,219***	***$***	***26,270,953***

BIOGENESIS SEDIMENT WASHING DEMONSTRATION PROJECT
SELECTED PHOTOGRAPHS

Photograph 1 Delivery of Sediment

Photograph 2 Offloading Operations

BIOGENESIS SEDIMENT WASHING DEMONSTRATION PROJECT
SELECTED PHOTOGRAPHS

Photograph 3 Sediment Screening (Primary Screen)

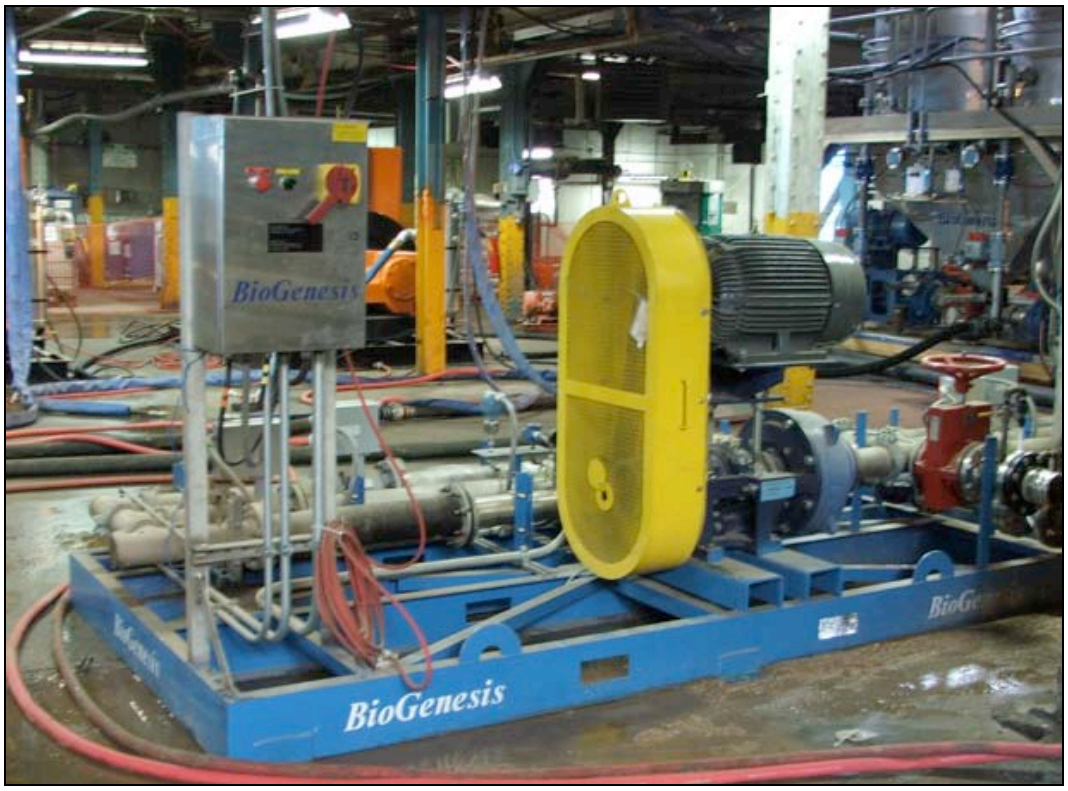
Photograph 4 Storage

BIOGENESIS SEDIMENT WASHING DEMONSTRATION PROJECT
SELECTED PHOTOGRAPHS

Photograph 5 BioGenesis Sediment Washing – Preprocessor

Photograph 6 BioGenesis Sediment Washing – Collision Chamber

BIOGENESIS SEDIMENT WASHING DEMONSTRATION PROJECT
SELECTED PHOTOGRAPHS



Photograph 7 BioGenesis Sediment Washing – Cavitation/Oxidation

Photograph 8 BioGenesis Sediment Washing – High Pressure Waster Pump

BIOGENESIS SEDIMENT WASHING DEMONSTRATION PROJECT
SELECTED PHOTOGRAPHS

Photograph 9 BioGenesis Sediment Washing – Liquid/Solid Separation

Photograph 10 Wastewater Treatment – Clarifier

Photograph 11 Wastewater Treatment – Pressure Filters

Photograph 12 Wastewater Treatment – Carbon Filters

Photograph 13 Manufactured Soil

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Untreated Sediment Prior to Secondary Screen						
Field Sample Identification			PSS-020506-1600	PSS-030506-1600	PSS-040506-1600	PSS-040506-1600B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1600	5/3/06 1600	5/4/06 1600	5/4/06 1600			
	New Jersey Standards								
General Soil Parameters	**RDCSCC**	**NRDCSCC**							
Percent Solids/EPA 160.3 M (%)	NE	NE	**21.5**	**26.6**	**33.5**	**44.8**	*31.6*	*21.5* -	*44.8*
Grain Size Sand/D4464 (%)	NE	NE	**23.46**	**26.86**	**25.51**	--	*25.28*	*23.46* -	*26.86*
Grain Size Silt/D4464 (%)	NE	NE	**57.34**	**54.43**	**55.8**	--	*55.86*	*54.43* -	*57.34*
Grain Size Clay/D4464 (%)	NE	NE	**19.2**	**18.71**	**18.69**	--	*18.87*	*18.69* -	*19.2*
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**57,600**	**55,400**	**48,400**	**58,700**	*55,025*	*48,400* -	*58,700*
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**3,940**	**3,700**	**4,310**	**8,400**	*5,088*	*3,700* -	*8,400*
Metals/									
SW-846 6010B/7471A (mg/kg)	**RDCSCC**	**NRDCSCC**							
Arsenic	20	20	**14.9**	**10.9**	**10.6**	**11.1 B**	*11.9*	*10.6* -	*14.9*
Barium	700	47,000	**244**	**179**	**177**	**449**	*262*	*177* -	*449*
Cadmium	39	100	**8.2**	**7.4**	**6.7**	**7.17**	*7.4*	*6.7* -	*8.2*
Chromium	120,000	NE	**251**	**195**	**178**	**218**	*211*	*178* -	*251*
Lead	400	600	**505**	**412**	**354 E**	**362**	*408*	*354* -	*505*
Nickel	250	2,400	**64.1**	**48.6**	**46.6**	**58.9**	*54.6*	*46.6* -	*64.1*
Selenium	63	3,100	**4**	**1.7**	**0.86**	1.66 U	*2.1*	*0.86* -	*4.0*
Silver	110	4,100	**8.4**	**7.4**	**6.3**	**7.33**	*7.4*	*6.3* -	*8.4*
Zinc	1,500	1,500	**886 JE**	**677 E**	**620 JE**	**675**	*715*	*620* -	*886*
Mercury	14	270	**4.5**	**4.3**	**4.6**	**4.24**	*4.4*	*4.24* -	*4.6*

TABLE 1
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Location Identification			Untreated Sediment Prior to Secondary Screen						
Field Sample Identification			PSS-020506-1600	PSS-030506-1600	PSS-040506-1600	PSS-040506-1600B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1600	5/3/06 1600	5/4/06 1600	5/4/06 1600			
Organochlorine Pesticides/ SW-846 8081A (µg/kg)	**RDCSCC**	**NRDCSCC**							
4,4'-DDD	3,000	12,000	--	**350 J**	--	--	--	--	--
4,4'-DDE	2,000	9,000	--	**120 T**	--	--	--	--	--
4,4'-DDT	2,000	9,000	--	**170**	--	--	--	--	--
Aldrin	40	170	--	*20 U*	--	--	--	--	--
alpha-BHC	NE	NE	--	160 U	--	--	--	--	--
alpha-Chlordane	NE	NE	--	160 U	--	--	--	--	--
beta-BHC	NE	NE	--	160 U	--	--	--	--	--
Chlordane (technical)	NE	NE	--	1600 U	--	--	--	--	--
delta-BHC	NE	NE	--	160 U	--	--	--	--	--
Dieldrin	42	180	--	**44 T**	--	--	--	--	--
Endosulfan I	340,000[a]	6,200,000[b]	--	160 U	--	--	--	--	--
Endosulfan II	340,000[a]	6,200,000[b]	--	**110 TJ**	--	--	--	--	--
Endosulfan sulfate	340,000[a]	6,200,000[b]	--	160 U	--	--	--	--	--
Endrin	17,000	310,000	--	**130 T**	--	--	--	--	--
Endrin aldehyde	NE	NE	--	160 U	--	--	--	--	--
Endrin ketone	NE	NE	--	160 U	--	--	--	--	--
gamma-BHC (Lindane)	520	2,200	--	**20 TJ**	--	--	--	--	--
gamma-Chlordane	NE	NE	--	160 U	--	--	--	--	--
Heptachlor	150	650	--	*15 U*	--	--	--	--	--
Heptachlor epoxide	NE	NE	--	160 U	--	--	--	--	--
Methoxychlor	280,000	5,200,000	--	310 U	--	--	--	--	--
Toxaphene	100	200	--	*21 U*	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Untreated Sediment Prior to Secondary Screen						
Field Sample Identification			PSS-020506-1600	PSS-030506-1600	PSS-040506-1600	PSS-040506-1600B	*Average*	*Min* -	*Max*
Sample Date			5/2/06	5/3/06	5/4/06	5/4/06			
Analyte/Methods (Units)	Sample Time		1600	1600	1600	1600			
Poly Chlorinated Biphenyls (PCBs)/									
SW-846 8082 (µg/kg)	**RDCSCC**	**NRDCSCC**							
(BZ 1) 2-Chlorobiphenyl	NE	NE	--	**56 TJB**	--	--	--	--	--
(BZ 101) 2,2',4,5, 5'-Pentachlorobiphenyl	NE	NE	--	**37**	--	--	--	--	--
(BZ 110) 2,3,3',4',6-Pentachlorobiphenyl	NE	NE	--	**48**	--	--	--	--	--
(BZ 141) 2,2',3,4,5,5'-Hexachlorobiphenyl	NE	NE	--	**11**	--	--	--	--	--
(BZ 151) 2,2',3,5,5',6-Hexachlorobiphenyl	NE	NE	--	6.4 U	--	--	--	--	--
(BZ 153) 2,2',4,4',5,5'-Hexachlorobiphenyl	NE	NE	--	**35**	--	--	--	--	--
(BZ 170) 2,2',3,3',4,4',5-Heptachlorobiphen	NE	NE	--	**16**	--	--	--	--	--
(BZ 18) 2,2',5-Trichlorobiphenyl	NE	NE	--	**65**	--	--	--	--	--
(BZ 180) 2,2',3,4,4',5,5'-Heptachlorobiphen	NE	NE	--	**27**	--	--	--	--	--
(BZ 187) 2,2',3,4',5,5',6-Heptachlorobiphen	NE	NE	--	**21**	--	--	--	--	--
(BZ 206) 2,2',3,3',4,4',5,5',6-Nonachlorobip	NE	NE	--	**5.2 T**	--	--	--	--	--
(BZ 31) 2,4',5-Trichlorobiphenyl	NE	NE	--	**69**	--	--	--	--	--
(BZ 5) 2,3-Dichlorobiphenyl	NE	NE	--	**1.2 TJ**	--	--	--	--	--
(BZ 52) 2,2',5,5'-Tetrachlorobiphenyl	NE	NE	--	**58**	--	--	--	--	--
(BZ 66) 2,3',4,4'-Tetrachlorobiphenyl	NE	NE	--	**58**	--	--	--	--	--
(BZ 87) 2,2',3,4,5'-Pentachlorobiphenyl	NE	NE	--	**13 J**	--	--	--	--	--
Total PCB Congeners	490	2,000	--	**520.4**	--	--	--	--	--

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LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Untreated Sediment Prior to Secondary Screen						
Field Sample Identification			PSS-020506-1600	PSS-030506-1600	PSS-040506-1600	PSS-040506-1600B	*Average*	*Min* -	*Max*
Sample Date / Sample Time / Analyte/Methods (Units)			5/2/06 1600	5/3/06 1600	5/4/06 1600	5/4/06 1600			
Semi-Volatile Organic Compounds (SVOCs)/ SW-846 8270C (µg/kg)	**RDCSCC**	**NRDCSCC**							
1,4-Dichlorobenzene	570,000	10,000,000	--	**97 T**	--	--	--	--	--
2,4,5-Trichlorophenol	5,600,000	10,000,000	--	3100 U	--	--	--	--	--
2,4,6-Trichlorophenol	62,000	270,000	--	3100 U	--	--	--	--	--
2,4-Dinitrotoluene	1,000	4,000	--	*33 U*	--	--	--	--	--
2-Methylphenol	2,800,000	10,000,000	--	3100 U	--	--	--	--	--
3-Methylphenol & 4-Methylphenol	2,800,000	10,000,000	--	3100 U	--	--	--	--	--
Acenaphthene	3,400,000	10,000,000	--	**120 T**	--	--	--	--	--
Acenaphthylene	NE	NE	--	**280 T**	--	--	--	--	--
Anthracene	10,000,000	10,000,000	--	**400 T**	--	--	--	--	--
Benzo(a)anthracene	900	4,000	--	**1000 T**	--	--	--	--	--
Benzo(a)pyrene	660	660	--	**970 T**	--	--	--	--	--
Benzo(b)fluoranthene	900	4,000	--	**1100 T**	--	--	--	--	--
Benzo(ghi)perylene	NE	NE	--	**720 T**	--	--	--	--	--
Benzo(k)fluoranthene	900	4,000	--	**450 T**	--	--	--	--	--
Chrysene	9,000	40,000	--	**1300 T**	--	--	--	--	--
Dibenz(a,h)anthracene	660	660	--	**160 T**	--	--	--	--	--
Fluoranthene	2,300,000	10,000,000	--	**1900 T**	--	--	--	--	--
Fluorene	2,300,000	10,000,000	--	**150 T**	--	--	--	--	--
Hexachlorobenzene	660	2,000	--	*63 U*	--	--	--	--	--
Hexachlorobutadiene	1,000	21,000	--	*61 U*	--	--	--	--	--
Hexachloroethane	6,000	100,000	--	3100 U	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	900	4,000	--	**730 T**	--	--	--	--	--
Naphthalene	230,000	4,200,000	--	**170 T**	--	--	--	--	--
Nitrobenzene	28,000	520,000	--	3100 U	--	--	--	--	--
Pentachlorophenol	6,000	24,000	--	*4300 U*	--	--	--	--	--
Pyrene	1,700,000	10,000,000	--	**1900 T**	--	--	--	--	--

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BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Untreated Sediment Prior to Secondary Screen						
Field Sample Identification			PSS-020506-1600	PSS-030506-1600	PSS-040506-1600	PSS-040506-1600B	*Average*	*Min* -	*Max*
Sample Date / Sample Time / Analyte/Methods (Units)			5/2/06 1600	5/3/06 1600	5/4/06 1600	5/4/06 1600			
Polynuclear Aromatic Hydrocarbons (PAHs)/ SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**							
Acenaphthene	3,400,000	10,000,000	**230 T**	**210**	**250**	**298**	*247*	*210* -	*298*
Acenaphthylene	NE	NE	**510**	**460**	**490**	**414**	*469*	*414* -	*510*
Anthracene	10,000,000	10,000,000	**840**	**870**	**1,100**	**973**	*946*	*840* -	*1,100*
Benzo(a)anthracene	900	4,000	**2,000**	**2,100**	**2,600**	**1,780**	*2,120*	*1,780* -	*2,600*
Benzo(a)pyrene	660	660	**2,200**	**2,000**	**2,300**	**1,800**	*2,075*	*1,800* -	*2,300*
Benzo(b)fluoranthene	900	4,000	**2,600**	**2,500**	**2,800**	**1,770**	*2,418*	*1,770* -	*2,800*
Benzo(ghi)perylene	NE	NE	**1,700**	**1,600**	**1,800**	**1,310**	*1,603*	*1,310* -	*1,800*
Benzo(k)fluoranthene	900	4,000	**1,000**	**930**	**1,000**	**1,720**	*1,163*	*930* -	*1,720*
Chrysene	9,000	40,000	**2,400**	**2,800**	**3,100**	**2,320**	*2,655*	*2,320* -	*3,100*
Dibenzo(a,h)anthracene	660	660	**390**	**370**	**420**	**390**	*393*	*370* -	*420*
Fluoranthene	2,300,000	10,000,000	**3,500**	**3,700**	**4,500**	**6,300**	*4,500*	*3,500* -	*6,300*
Fluorene	2,300,000	10,000,000	**280 T**	**260**	**290**	**349**	*295*	*260* -	*349*
Indeno (1,2,3-c,d)pyrene	900	4,000	**1,400**	**1,300**	**1,500**	**1,070**	*1,318*	*1,070* -	*1,500*
Naphthalene	230,000	4,200,000	**250 T**	**250**	**300**	**484**	*321*	*250* -	*484*
Phenanthrene	NE	NE	**1,700**	**1,800**	**2,800**	**2,060**	*2,090*	*1,700* -	*2,800*
Pyrene	1,700,000	10,000,000	**3,900**	**3,300**	**3,900**	**6,470**	*4,393*	*3,300* -	*6,470*

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	Location Identification		Untreated Sediment Prior to Secondary Screen						
	Field Sample Identification		PSS-020506-1600	PSS-030506-1600	PSS-040506-1600	PSS-040506-1600B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1600	5/3/06 1600	5/4/06 1600	5/4/06 1600			
Dioxins and Furans/									
SW-846 8290 (pg/g)	**RDCSCC**	**NRDCSCC**							
1,2,3,4,6,7,8-HpCDD	NE	NE	--	**730**	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	NE	NE	--	**910**	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	NE	NE	--	**30**	--	--	--	--	--
1,2,3,4,7,8-HxCDD	NE	NE	--	**13 T**	--	--	--	--	--
1,2,3,4,7,8-HxCDF	NE	NE	--	**190**	--	--	--	--	--
1,2,3,6,7,8-HxCDD	NE	NE	--	**58**	--	--	--	--	--
1,2,3,6,7,8-HxCDF	NE	NE	--	**56**	--	--	--	--	--
1,2,3,7,8,9-HxCDD	NE	NE	--	**23**	--	--	--	--	--
1,2,3,7,8,9-HxCDF	NE	NE	--	**2.7 T**	--	--	--	--	--
1,2,3,7,8-PeCDD	NE	NE	--	**9.3 T**	--	--	--	--	--
1,2,3,7,8-PeCDF	NE	NE	--	**21**	--	--	--	--	--
2,3,4,6,7,8-HxCDF	NE	NE	--	**22**	--	--	--	--	--
2,3,4,7,8-PeCDF	NE	NE	--	**63**	--	--	--	--	--
2,3,7,8-TCDD	NE	NE	--	**330**	--	--	--	--	--
2,3,7,8-TCDF	NE	NE	--	**27**	--	--	--	--	--
OCDD	NE	NE	--	**8000 B**	--	--	--	--	--
OCDF	NE	NE	--	**1100**	--	--	--	--	--
Total Dioxins & Furans - summed by toxic equivalency factor (TEF) methodology	NE	NE	--	**432.17**	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Oversized from top deck of Secondary Screen			
	Field Sample Identification		SS1-020506-1605	SS1-030506-1605	SS1-040506-1605	SS1-040506-1605B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1605	5/3/06 1605	5/4/06 1605	5/4/06 1605
	New Jersey Standards					
General Soil Parameters	**RDCSCC**	**NRDCSCC**				
Percent Solids/EPA 160.3 M (%)	NE	NE	**25.3**	**28.7**	**32.7**	**29.3**
Grain Size Sand/D4464 (%)	NE	NE	**21.9**	**12.07**	**19.37**	--
Grain Size Silt/D4464 (%)	NE	NE	**61.01**	**66.57**	**61.53**	--
Grain Size Clay/D4464 (%)	NE	NE	**17.09**	**21.36**	**19.11**	--
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**282,000**	**291,000**	**187,000**	**102,000**
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**6,250**	**5,640**	**5,970**	**15,000**
Metals/						
SW-846 6010B/7471A (mg/kg)	**RDCSCC**	**NRDCSCC**				
Arsenic	20	20	**15.7**	**14.4**	**12.8**	**12.5 B**
Barium	700	47,000	**146**	**134**	**137**	**232**
Cadmium	39	100	**5.3**	**6.8**	**6.4**	**5.61**
Chromium	120,000	NE	**157**	**155**	**149**	**157**
Lead	400	600	**297**	**314**	**324**	**284**
Nickel	250	2,400	**48.3**	**45**	**44.9**	**39.8**
Selenium	63	3,100	**3.5**	**1.8**	**1.2**	1.66 U
Silver	110	4,100	**4**	**4.4**	**4.6**	**4.01**
Zinc	1,500	1,500	**1330 J**	**749**	**635 J**	**591**
Mercury	14	270	**3**	**3**	**2.9**	**3**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Oversized from top deck of Secondary Screen			
	Field Sample Identification		SS1-020506-1605	SS1-030506-1605	SS1-040506-1605	SS1-040506-1605B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1605	5/3/06 1605	5/4/06 1605	5/4/06 1605
Polynuclear Aromatic Hydrocarbons (PAHs)/						
SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**				
Acenaphthene	3,400,000	10,000,000	**260 T**	**340 T**	**280**	**920**
Acenaphthylene	NE	NE	**720**	**520**	**430**	**901**
Anthracene	10,000,000	10,000,000	**1,100**	**920**	**9,500**	**5,440**
Benzo(a)anthracene	900	4,000	**2,800**	**2,700**	**4,000**	**11,800**
Benzo(a)pyrene	660	660	**2,400**	**2,500**	**2,200**	**9,490**
Benzo(b)fluoranthene	900	4,000	**2,700**	**2,900**	**2,500**	**7,810**
Benzo(ghi)perylene	NE	NE	**1,500**	**1,700**	**1,200**	**5,750**
Benzo(k)fluoranthene	900	4,000	**860**	**1,100**	**1,200**	**9,320**
Chrysene	9,000	40,000	**3,400**	**3,100**	**5,000**	**12,800**
Dibenzo(a,h)anthracene	660	660	**390 T**	**430 T**	**310**	**2,040**
Fluoranthene	2,300,000	10,000,000	**3,300**	**4,300**	**8,500**	**36,700**
Fluorene	2,300,000	10,000,000	**330 T**	**340 T**	**460**	**763**
Indeno (1,2,3-c,d)pyrene	900	4,000	**1,200**	**1,400**	**990**	**5,240**
Naphthalene	230,000	4,200,000	**790**	**360 T**	**150 T**	**661**
Phenanthrene	NE	NE	**1,400**	**1,800**	**4,900**	**15,900**
Pyrene	1,700,000	10,000,000	**3,900**	**4,300**	**6,800**	**31,700**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Oversized from lower deck of Secondary Screen			
	Field Sample Identification		SS2-020506-1612	SS2-030506-1610	SS2-040506-1612	SS2-040506-1612B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1610	5/3/06 1610	5/4/06 1610	5/4/06 1610
	New Jersey Standards					
General Soil Parameters	RDCSCC	NRDCSCC				
Percent Solids/EPA 160.3 M (%)	NE	NE	**22.2**	**25.5**	**33.7**	**33.7**
Grain Size Sand/D4464 (%)	NE	NE	**55.1**	**37.65**	**26.82**	**--**
Grain Size Silt/D4464 (%)	NE	NE	**34.67**	**44.39**	**53.23**	**--**
Grain Size Clay/D4464 (%)	NE	NE	**10.23**	**17.95**	**19.95**	**--**
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**337,000**	**305,000**	**71,300**	**113,000**
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**9,530**	**5,860**	**4,450**	**7,700**
Metals/						
SW-846 6010B/7471A (mg/kg)	RDCSCC	NRDCSCC				
Arsenic	20	20	**17.5**	**15.5**	**10.9**	**13.5 B**
Barium	700	47,000	**184**	**168**	**151**	**363**
Cadmium	39	100	**6.6**	**7.7**	**6.3**	**6.17**
Chromium	120,000	NE	**269**	**212**	**165**	**221**
Lead	400	600	**461**	**447**	**343**	**459**
Nickel	250	2,400	**57**	**82.4**	**44.2**	**50.4**
Selenium	63	3,100	**4**	**2.2**	**1.1**	**1.66** U
Silver	110	4,100	**4.9**	**5.2**	**5.3**	**5.3**
Zinc	1,500	1,500	**960 J**	**883**	**621 J**	**651**
Mercury	14	270	**3.9**	**4.1**	**3.9**	**3.71**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Oversized from lower deck of Secondary Screen			
	Field Sample Identification		SS2-020506-1612	SS2-030506-1610	SS2-040506-1612	SS2-040506-1612B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1610	5/3/06 1610	5/4/06 1610	5/4/06 1610
Polynuclear Aromatic Hydrocarbons (PAHs)/						
SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**				
Acenaphthene	3,400,000	10,000,000	**740**	**510 T**	**420**	**450**
Acenaphthylene	NE	NE	**4,200**	**1,600**	**1,000**	**1,090**
Anthracene	10,000,000	10,000,000	**3,000**	**1,900**	**1,600**	**1,710**
Benzo(a)anthracene	900	4,000	**12,000**	**5,600**	**3,800**	**3,240**
Benzo(a)pyrene	660	660	**13,000**	**5,000**	**3,600**	**3,410**
Benzo(b)fluoranthene	900	4,000	**9,900**	**5,200**	**3,800**	**3,020**
Benzo(ghi)perylene	NE	NE	**7,500**	**3,300**	**2,600**	**2,290**
Benzo(k)fluoranthene	900	4,000	**4,300**	**2,200**	**1,700**	**3,230**
Chrysene	9,000	40,000	**12,000**	**6,200**	**4,600**	**4,940**
Dibenzo(a,h)anthracene	660	660	**1,700**	**890**	**730**	**743**
Fluoranthene	2,300,000	10,000,000	**12,000**	**7,700**	**5,700**	**14,500**
Fluorene	2,300,000	10,000,000	**870**	**640**	**470**	**395**
Indeno (1,2,3-c,d)pyrene	900	4,000	**5,700**	**2,700**	**2,100**	**1,960**
Naphthalene	230,000	4,200,000	**620**	**360 T**	**380**	**599**
Phenanthrene	NE	NE	**3,600**	**3,500**	**2,700**	**2,580**
Pyrene	1,700,000	10,000,000	**18,000**	**7,300**	**5,400**	**13,700**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Untreated Sediment after Secondary Screen						
Field Sample Identification			RS-020506-1616	RS-030506-1615	RS-040506-1616	RS-040506-1616B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1616	5/3/06 1615	5/4/06 1616	5/4/06 1616			
	New Jersey Standards								
General Soil Parameters	**RDCSCC**	**NRDCSCC**							
Percent Solids/EPA 160.3 M (%)	NE	NE	**31**	**26**	**32.6**	**43**	*33.2*	*26.0* -	*43.0*
Grain Size Sand/D4464 (%)	NE	NE	**24.32**	**24.32**	**24.16**	--	*24.27*	*24.16* -	*24.32*
Grain Size Silt/D4464 (%)	NE	NE	**56.71**	**56.19**	**56.7**	--	*56.53*	*56.19* -	*56.71*
Grain Size Clay/D4464 (%)	NE	NE	**18.97**	**19.49**	**19.14**	--	*19.20*	*18.97* -	*19.49*
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**78,600**	**56,700**	**55,000**	**53,900**	*61,050*	*53,900* -	*78,600*
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**1,330**	**3,670**	**3,480**	**4,700**	*3,295*	*1,330* -	*4,700*
Metals/									
SW-846 6010B/7471A (mg/kg)	**RDCSCC**	**NRDCSCC**							
Arsenic	20	20	**9.8**	**11**	**10.6**	**10.5 B**	*10.5*	*9.8* -	*11*
Barium	700	47,000	**164**	**177**	**183**	**439**	*241*	*164* -	*439*
Cadmium	39	100	**5**	**6.9**	**6.8**	**7.08**	*6.4*	*5* -	*7.08*
Chromium	120,000	NE	**171**	**180**	**179**	**221**	*188*	*171* -	*221*
Lead	400	600	**336**	**377**	**348**	**357**	*355*	*336* -	*377*
Nickel	250	2,400	**44.7**	**46.9**	**46.3**	**57.7**	*48.9*	*44.7* -	*57.7*
Selenium	63	3,100	**2.5**	**1.1**	0.77 U	1.66 U	*1.5*	*0.77* -	*2.5*
Silver	110	4,100	**5.7**	**6.3**	**6.3**	**7.26**	*6.4*	*5.7* -	*7.26*
Zinc	1,500	1,500	**614 J**	**655**	**617 J**	**690**	*644*	*614* -	*690*
Mercury	14	270	**3.8**	**4**	**4.2**	**4.39**	*4.1*	*3.8* -	*4.39*

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Untreated Sediment after Secondary Screen						
	Field Sample Identification		RS-020506-1616	RS-030506-1615	RS-040506-1616	RS-040506-1616B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	**Sample Date / Sample Time**		5/2/06 1616	5/3/06 1615	5/4/06 1616	5/4/06 1616			
Organochlorine Pesticides/ SW-846 8081A (µg/kg)	**RDCSCC**	**NRDCSCC**							
4,4'-DDD	3,000	12,000	--	**30 TJ**	--	--	--	--	--
4,4'-DDE	2,000	9,000	--	**81 T**	--	--	--	--	--
4,4'-DDT	2,000	9,000	--	**51 TJ**	--	--	--	--	--
Aldrin	40	170	--	*20 U*	--	--	--	--	--
alpha-BHC	NE	NE	--	160 U	--	--	--	--	--
alpha-Chlordane	NE	NE	--	160 U	--	--	--	--	--
beta-BHC	NE	NE	--	160 U	--	--	--	--	--
Chlordane (technical)	NE	NE	--	1600 U	--	--	--	--	--
delta-BHC	NE	NE	--	160 U	--	--	--	--	--
Dieldrin	42	180	--	*16 U*	--	--	--	--	--
Endosulfan I	340,000[a]	6,200,000[b]	--	160 U	--	--	--	--	--
Endosulfan II	340,000[a]	6,200,000[b]	--	160 U	--	--	--	--	--
Endosulfan sulfate	340,000[a]	6,200,000[b]	--	160 U	--	--	--	--	--
Endrin	17,000	310,000	--	**43 TJ**	--	--	--	--	--
Endrin aldehyde	NE	NE	--	160 U	--	--	--	--	--
Endrin ketone	NE	NE	--	160 U	--	--	--	--	--
gamma-BHC (Lindane)	520	2,200	--	160 U	--	--	--	--	--
gamma-Chlordane	NE	NE	--	160 U	--	--	--	--	--
Heptachlor	150	650	--	*16 U*	--	--	--	--	--
Heptachlor epoxide	NE	NE	--	160 U	--	--	--	--	--
Methoxychlor	280,000	5,200,000	--	320 U	--	--	--	--	--
Toxaphene	100	200	--	*220 U*	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Untreated Sediment after Secondary Screen						
	Field Sample Identification		RS-020506-1616	RS-030506-1615	RS-040506-1616	RS-040506-1616B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	**Sample Date / Sample Time**		5/2/06 1616	5/3/06 1615	5/4/06 1616	5/4/06 1616			
Poly Chlorinated Biphenyls (PCBs)/ SW-846 8082 (µg/kg)	**RDCSCC**	**NRDCSCC**							
(BZ 1) 2-Chlorobiphenyl	NE	NE	--	**49 TJB**	--	--	--	--	--
(BZ 101) 2,2',4,5, 5'-Pentachlorobiphenyl	NE	NE	--	**31**	--	--	--	--	--
(BZ 110) 2,3,3',4',6-Pentachlorobiphenyl	NE	NE	--	**41**	--	--	--	--	--
(BZ 141) 2,2',3,4,5,5'-Hexachlorobiphenyl	NE	NE	--	**9.5**	--	--	--	--	--
(BZ 151) 2,2',3,5,5',6-Hexachlorobiphenyl	NE	NE	--	6.5 U	--	--	--	--	--
(BZ 153) 2,2',4,4',5,5'-Hexachlorobiphenyl	NE	NE	--	**29**	--	--	--	--	--
(BZ 170) 2,2',3,3',4,4',5-Heptachlorobiphen	NE	NE	--	**14**	--	--	--	--	--
(BZ 18) 2,2',5-Trichlorobiphenyl	NE	NE	--	**56**	--	--	--	--	--
(BZ 180) 2,2',3,4,4',5,5'-Heptachlorobiphen	NE	NE	--	**23**	--	--	--	--	--
(BZ 187) 2,2',3,4',5,5',6-Heptachlorobiphen	NE	NE	--	**18**	--	--	--	--	--
(BZ 206) 2,2',3,3',4,4',5,5',6-Nonachlorobip	NE	NE	--	**4.5 T**	--	--	--	--	--
(BZ 31) 2,4',5-Trichlorobiphenyl	NE	NE	--	**57**	--	--	--	--	--
(BZ 5) 2,3-Dichlorobiphenyl	NE	NE	--	6.5 U	--	--	--	--	--
(BZ 52) 2,2',5,5'-Tetrachlorobiphenyl	NE	NE	--	**51**	--	--	--	--	--
(BZ 66) 2,3',4,4'-Tetrachlorobiphenyl	NE	NE	--	**47**	--	--	--	--	--
(BZ 87) 2,2',3,4,5'-Pentachlorobiphenyl	NE	NE	--	**12 J**	--	--	--	--	--
Total PCB Congeners	490	2,000	--	**442**	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Untreated Sediment after Secondary Screen						
Field Sample Identification			RS-020506-1616	RS-030506-1615	RS-040506-1616	RS-040506-1616B	*Average*	*Min* -	*Max*
Sample Date			5/2/06	5/3/06	5/4/06	5/4/06			
Analyte/Methods (Units)	Sample Time		1616	1615	1616	1616			
Semi-Volatile Organic Compounds (SVOCs)/									
SW-846 8270C (µg/kg)	**RDCSCC**	**NRDCSCC**							
1,4-Dichlorobenzene	570,000	10,000,000	--	**230 T**	--	--	--	--	--
2,4,5-Trichlorophenol	5,600,000	10,000,000	--	3200 U	--	--	--	--	--
2,4,6-Trichlorophenol	62,000	270,000	--	3200 U	--	--	--	--	--
2,4-Dinitrotoluene	1,000	4,000	--	*34 U*	--	--	--	--	--
2-Methylphenol	2,800,000	10,000,000	--	3200 U	--	--	--	--	--
3-Methylphenol & 4-Methylphenol	2,800,000	10,000,000	--	3200 U	--	--	--	--	--
Acenaphthene	3,400,000	10,000,000	--	**300 T**	--	--	--	--	--
Acenaphthylene	NE	NE	--	**700 T**	--	--	--	--	--
Anthracene	10,000,000	10,000,000	--	**960 T**	--	--	--	--	--
Benzo(a)anthracene	900	4,000	--	**2300 T**	--	--	--	--	--
Benzo(a)pyrene	660	660	--	**2300 T**	--	--	--	--	--
Benzo(b)fluoranthene	900	4,000	--	**2600 T**	--	--	--	--	--
Benzo(ghi)perylene	NE	NE	--	**1300 T**	--	--	--	--	--
Benzo(k)fluoranthene	900	4,000	--	**1000 T**	--	--	--	--	--
Chrysene	9,000	40,000	--	**3000 T**	--	--	--	--	--
Dibenz(a,h)anthracene	660	660	--	**300 T**	--	--	--	--	--
Fluoranthene	2,300,000	10,000,000	--	**5100**	--	--	--	--	--
Fluorene	2,300,000	10,000,000	--	**340 T**	--	--	--	--	--
Hexachlorobenzene	660	2,000	--	*65 U*	--	--	--	--	--
Hexachlorobutadiene	1,000	21,000	--	*63 U*	--	--	--	--	--
Hexachloroethane	6,000	100,000	--	3200 U	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	900	4,000	--	**1400 T**	--	--	--	--	--
Naphthalene	230,000	4,200,000	--	**340 T**	--	--	--	--	--
Nitrobenzene	28,000	520,000	--	3200 U	--	--	--	--	--
Pentachlorophenol	6,000	24,000	--	*4400 U*	--	--	--	--	--
Pyrene	1,700,000	10,000,000	--	**4500**	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

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	Location Identification		Untreated Sediment after Secondary Screen						
	Field Sample Identification		RS-020506-1616	RS-030506-1615	RS-040506-1616	RS-040506-1616B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	**Sample Date / Sample Time**		5/2/06 1616	5/3/06 1615	5/4/06 1616	5/4/06 1616			
Polynuclear Aromatic Hydrocarbons (PAHs)/									
SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**							
Acenaphthene	3,400,000	10,000,000	**180 T**	**240 T**	**270**	**340**	*258*	*180* -	*340*
Acenaphthylene	NE	NE	**410**	**570**	**610**	**501**	*523*	*410* -	*610*
Anthracene	10,000,000	10,000,000	**650**	**880**	**1,100**	**1,210**	*960*	*650* -	*1,210*
Benzo(a)anthracene	900	4,000	**1,600**	**2,200**	**2,400**	**2,000**	*2,050*	*1,600* -	*2,400*
Benzo(a)pyrene	660	660	**1,600**	**2,100**	**2,500**	**2,170**	*2,093*	*1,600* -	*2,500*
Benzo(b)fluoranthene	900	4,000	**1,900**	**2,700**	**2,800**	**1,960**	*2,340*	*1,900* -	*2,800*
Benzo(ghi)perylene	NE	NE	**1,300**	**1,900**	**2,000**	**1,730**	*1,733*	*1,300* -	*2,000*
Benzo(k)fluoranthene	900	4,000	**720**	**770**	**1,200**	**2,060**	*1,188*	*720* -	*2,060*
Chrysene	9,000	40,000	**1,900**	**2,800**	**3,100**	**2,560**	*2,590*	*1,900* -	*3,100*
Dibenzo(a,h)anthracene	660	660	**300**	**460**	**470**	**513**	*436*	*300* -	*513*
Fluoranthene	2,300,000	10,000,000	**2,800**	**4,000**	**4,600**	**6,850**	*4,563*	*2,800* -	*6,850*
Fluorene	2,300,000	10,000,000	**210**	**290**	**320**	**412**	*308*	*210* -	*412*
Indeno (1,2,3-c,d)pyrene	900	4,000	**1,100**	**1,600**	**1,700**	**1,410**	*1,453*	*1,100* -	*1,700*
Naphthalene	230,000	4,200,000	**170 T**	**240 T**	**280**	**571**	*315*	*170* -	*571*
Phenanthrene	NE	NE	**1,300**	**1,700**	**2,100**	**2,330**	*1,858*	*1,300* -	*2,330*
Pyrene	1,700,000	10,000,000	**2,700**	**3,600**	**4,000**	**6,960**	*4,315*	*2,700* -	*6,960*

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Untreated Sediment after Secondary Screen						
	Field Sample Identification		RS-020506-1616	RS-030506-1615	RS-040506-1616	RS-040506-1616B	*Average*	*Min* -	*Max*
	Sample Date		5/2/06	5/3/06	5/4/06	5/4/06			
Analyte/Methods (Units)	**Sample Time**		1616	1615	1616	1616			
Dioxins and Furans/									
SW-846 8290 (pg/g)	**RDCSCC**	**NRDCSCC**							
1,2,3,4,6,7,8-HpCDD	NE	NE	--	**760**	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	NE	NE	--	**940**	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	NE	NE	--	**33**	--	--	--	--	--
1,2,3,4,7,8-HxCDD	NE	NE	--	**9.8 T**	--	--	--	--	--
1,2,3,4,7,8-HxCDF	NE	NE	--	**200**	--	--	--	--	--
1,2,3,6,7,8-HxCDD	NE	NE	--	**52 J**	--	--	--	--	--
1,2,3,6,7,8-HxCDF	NE	NE	--	**68**	--	--	--	--	--
1,2,3,7,8,9-HxCDD	NE	NE	--	**40**	--	--	--	--	--
1,2,3,7,8,9-HxCDF	NE	NE	--	17 U	--	--	--	--	--
1,2,3,7,8-PeCDD	NE	NE	--	**12 T**	--	--	--	--	--
1,2,3,7,8-PeCDF	NE	NE	--	**54**	--	--	--	--	--
2,3,4,6,7,8-HxCDF	NE	NE	--	**25**	--	--	--	--	--
2,3,4,7,8-PeCDF	NE	NE	--	**49**	--	--	--	--	--
2,3,7,8-TCDD	NE	NE	--	**430**	--	--	--	--	--
2,3,7,8-TCDF	NE	NE	--	**23**	--	--	--	--	--
OCDD	NE	NE	--	**8400 B**	--	--	--	--	--
OCDF	NE	NE	--	**920**	--	--	--	--	--
Total Dioxins & Furans - summed by toxic equivalency factor (TEF) methodology	NE	NE	--	**531.63**	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Treated Sediment						
Field Sample Identification			TS-020506-1635	TS-030506-1635	TS-040506-1635	TS-040506-1635B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1635	5/3/06 1635	5/4/06 1635	5/4/06 1635			
	New Jersey Standards								
General Soil Parameters	**RDCSCC**	**NRDCSCC**							
Percent Solids/EPA 160.3 M (%)	NE	NE	**64.7**	**68.2**	**65.1**	**66.9**	*66.2*	*64.7* -	*68.2*
Grain Size Sand/D4464 (%)	NE	NE	**13.69**	**22.03**	**14.73**	--	*16.8*	*13.69* -	*22.03*
Grain Size Silt/D4464 (%)	NE	NE	**66.29**	**60.25**	**65.66**	--	*64.1*	*60.25* -	*66.29*
Grain Size Clay/D4464 (%)	NE	NE	**20.02**	**17.72**	**19.61**	--	*19.1*	*17.72* -	*20.02*
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**51,700**	**45,900**	**44,900**	**47,800**	*47,575*	*44,900* -	*51,700*
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**1,900**	**1,300**	**1,320**	**3,000**	*1,880*	*1,300* -	*3,000*
Metals/									
SW-846 6010B/7471A (mg/kg)	**RDCSCC**	**NRDCSCC**							
Arsenic	20	20	**7.7**	**6.8**	**7.2**	**8.31 B**	*7.5*	*6.8* -	*8.31*
Barium	700	47,000	**137**	**120**	**137**	**431**	*206*	*120* -	*431*
Cadmium	39	100	**2.9**	**3.9**	**4.2**	**5.03**	*4.0*	*2.9* -	*5.03*
Chromium	120,000	NE	**97.3**	**86.4**	**91.2**	**148**	*106*	*86.4* -	*148*
Lead	400	600	**241**	**221**	**234**	**266**	*241*	*221* -	*266*
Nickel	250	2,400	**38.2**	**34**	**37.3**	**54.3**	*41*	*34* -	*54.3*
Selenium	63	3,100	**2.1**	**0.74**	0.38 U	1.66 U	*1.2*	*0.38* -	*2.1*
Silver	110	4,100	**3.1**	**2.8**	**3**	**4.08**	*3.2*	*2.8* -	*4.08*
Zinc	1,500	1,500	**394 J**	**344**	**366 J**	**467**	*393*	*344* -	*467*
Mercury	14	270	**3.2**	**2.6**	**3.3**	**3.03**	*3.0*	*2.6* -	*3.3*

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Treated Sediment						
	Field Sample Identification		TS-020506-1635	TS-030506-1635	TS-040506-1635	TS-040506-1635B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	**Sample Date / Sample Time**		5/2/06 1635	5/3/06 1635	5/4/06 1635	5/4/06 1635			
Organochlorine Pesticides/									
SW-846 8081A (µg/kg)	**RDCSCC**	**NRDCSCC**							
4,4'-DDD	3,000	12,000	--	**98 J**	--	--	--	--	--
4,4'-DDE	2,000	9,000	--	**89**	--	--	--	--	--
4,4'-DDT	2,000	9,000	--	**120**	--	--	--	--	--
Aldrin	40	170	--	*7.8 U*	--	--	--	--	--
alpha-BHC	NE	NE	--	62 U	--	--	--	--	--
alpha-Chlordane	NE	NE	--	62 U	--	--	--	--	--
beta-BHC	NE	NE	--	62 U	--	--	--	--	--
Chlordane (technical)	NE	NE	--	620 U	--	--	--	--	--
delta-BHC	NE	NE	--	62 U	--	--	--	--	--
Dieldrin	42	180	--	**34 T**	--	--	--	--	--
Endosulfan I	340,000[a]	6,200,000[b]	--	62 U	--	--	--	--	--
Endosulfan II	340,000[a]	6,200,000[b]	--	**74 J**	--	--	--	--	--
Endosulfan sulfate	340,000[a]	6,200,000[b]	--	62 U	--	--	--	--	--
Endrin	17,000	310,000	--	**89**	--	--	--	--	--
Endrin aldehyde	NE	NE	--	62 U	--	--	--	--	--
Endrin ketone	NE	NE	--	62 U	--	--	--	--	--
gamma-BHC (Lindane)	520	2,200	--	62 U	--	--	--	--	--
gamma-Chlordane	NE	NE	--	62 U	--	--	--	--	--
Heptachlor	150	650	--	62 U	--	--	--	--	--
Heptachlor epoxide	NE	NE	--	62 U	--	--	--	--	--
Methoxychlor	280,000	5,200,000	--	120 U	--	--	--	--	--
Toxaphene	100	200	--	*83 U*	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Treated Sediment						
Field Sample Identification			TS-020506-1635	TS-030506-1635	TS-040506-1635	TS-040506-1635B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1635	5/3/06 1635	5/4/06 1635	5/4/06 1635			
Poly Chlorinated Biphenyls (PCBs)/ SW-846 8082 (µg/kg)	**RDCSCC**	**NRDCSCC**							
(BZ 1) 2-Chlorobiphenyl	NE	NE	--	**65 B**	--	--	--	--	--
(BZ 101) 2,2',4,5, 5'-Pentachlorobiphenyl	NE	NE	--	**28**	--	--	--	--	--
(BZ 110) 2,3,3',4',6-Pentachlorobiphenyl	NE	NE	--	**38**	--	--	--	--	--
(BZ 141) 2,2',3,4,5,5'-Hexachlorobiphenyl	NE	NE	--	**8.4**	--	--	--	--	--
(BZ 151) 2,2',3,5,5',6-Hexachlorobiphenyl	NE	NE	--	2.5 U	--	--	--	--	--
(BZ 153) 2,2',4,4',5,5'-Hexachlorobiphenyl	NE	NE	--	**26**	--	--	--	--	--
(BZ 170) 2,2',3,3',4,4',5-Heptachlorobiphen	NE	NE	--	**12**	--	--	--	--	--
(BZ 18) 2,2',5-Trichlorobiphenyl	NE	NE	--	**53**	--	--	--	--	--
(BZ 180) 2,2',3,4,4',5,5'-Heptachlorobiphen	NE	NE	--	**16 J**	--	--	--	--	--
(BZ 187) 2,2',3,4',5,5',6-Heptachlorobiphen	NE	NE	--	**15**	--	--	--	--	--
(BZ 206) 2,2',3,3',4,4',5,5',6-Nonachlorobip	NE	NE	--	**4.5**	--	--	--	--	--
(BZ 31) 2,4',5-Trichlorobiphenyl	NE	NE	--	**59**	--	--	--	--	--
(BZ 5) 2,3-Dichlorobiphenyl	NE	NE	--	**1.1 TJ**	--	--	--	--	--
(BZ 52) 2,2',5,5'-Tetrachlorobiphenyl	NE	NE	--	**49**	--	--	--	--	--
(BZ 66) 2,3',4,4'-Tetrachlorobiphenyl	NE	NE	--	**45**	--	--	--	--	--
(BZ 87) 2,2',3,4,5'-Pentachlorobiphenyl	NE	NE	--	**11 J**	--	--	--	--	--
Total PCB Congeners	490	2,000	--	**431**	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Treated Sediment						
Field Sample Identification			TS-020506-1635	TS-030506-1635	TS-040506-1635	TS-040506-1635B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1635	5/3/06 1635	5/4/06 1635	5/4/06 1635			
Semi-Volatile Organic Compounds (SVOCs)/ SW-846 8270C (µg/kg)	**RDCSCC**	**NRDCSCC**							
1,4-Dichlorobenzene	570,000	10,000,000	--	**170 T**	--	--	--	--	--
2,4,5-Trichlorophenol	5,600,000	10,000,000	--	1200 U	--	--	--	--	--
2,4,6-Trichlorophenol	62,000	270,000	--	1200 U	--	--	--	--	--
2,4-Dinitrotoluene	1,000	4,000	--	*13 U*	--	--	--	--	--
2-Methylphenol	2,800,000	10,000,000	--	1200 U	--	--	--	--	--
3-Methylphenol & 4-Methylphenol	2,800,000	10,000,000	--	230 **T**	--	--	--	--	--
Acenaphthene	3,400,000	10,000,000	--	**190 T**	--	--	--	--	--
Acenaphthylene	NE	NE	--	**380 T**	--	--	--	--	--
Anthracene	10,000,000	10,000,000	--	**630 T**	--	--	--	--	--
Benzo(a)anthracene	900	4,000	--	**1500**	--	--	--	--	--
Benzo(a)pyrene	660	660	--	**1400**	--	--	--	--	--
Benzo(b)fluoranthene	900	4,000	--	**1700**	--	--	--	--	--
Benzo(ghi)perylene	NE	NE	--	**590 T**	--	--	--	--	--
Benzo(k)fluoranthene	900	4,000	--	**720 T**	--	--	--	--	--
Chrysene	9,000	40,000	--	**1900**	--	--	--	--	--
Dibenz(a,h)anthracene	660	660	--	**150 T**	--	--	--	--	--
Fluoranthene	2,300,000	10,000,000	--	**3600**	--	--	--	--	--
Fluorene	2,300,000	10,000,000	--	**230 T**	--	--	--	--	--
Hexachlorobenzene	660	2,000	--	*25 U*	--	--	--	--	--
Hexachlorobutadiene	1,000	21,000	--	*24 U*	--	--	--	--	--
Hexachloroethane	6,000	100,000	--	1200 U	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	900	4,000	--	**660 T**	--	--	--	--	--
Naphthalene	230,000	4,200,000	--	**260 T**	--	--	--	--	--
Nitrobenzene	28,000	520,000	--	1200 U	--	--	--	--	--
Pentachlorophenol	6,000	24,000	--	*5900* U	--	--	--	--	--
Pyrene	1,700,000	10,000,000	--	**2700**	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Treated Sediment						
	Field Sample Identification		TS-020506-1635	TS-030506-1635	TS-040506-1635	TS-040506-1635B	*Average*	*Min*	*Max*
Analyte/Methods (Units)	**Sample Date / Sample Time**		5/2/06 1635	5/3/06 1635	5/4/06 1635	5/4/06 1635			
Polynuclear Aromatic Hydrocarbons (PAHs)/									
SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**							
Acenaphthene	3,400,000	10,000,000	**300**	**160**	**200**	**366**	*257*	*160*	*366*
Acenaphthylene	NE	NE	**700**	**330**	**400**	**560**	*498*	*330*	*700*
Anthracene	10,000,000	10,000,000	**1,200**	**600**	**800**	**1,350**	*988*	*600*	*1,350*
Benzo(a)anthracene	900	4,000	**2,800**	**1,500**	**1,900**	**2,340**	*2,135*	*1,500*	*2,800*
Benzo(a)pyrene	660	660	**2,700**	**1,400**	**1,800**	**2,670**	*2,143*	*1,400*	*2,700*
Benzo(b)fluoranthene	900	4,000	**3,100**	**1,700**	**2,100**	**2,440**	*2,335*	*1,700*	*3,100*
Benzo(ghi)perylene	NE	NE	**2,300**	**1,100**	**1,500**	**2,180**	*1,770*	*1,100*	*2,300*
Benzo(k)fluoranthene	900	4,000	**1,400**	**630**	**880**	**2,460**	*1,343*	*630*	*2,460*
Chrysene	9,000	40,000	**3,500**	**1,900**	**2,400**	**3,010**	*2,703*	*1,900*	*3,500*
Dibenzo(a,h)anthracene	660	660	**580**	**260**	**360**	**664**	*466*	*260*	*664*
Fluoranthene	2,300,000	10,000,000	**4,900**	**2,700**	**3,400**	**7,580**	*4,645*	*2,700*	*7,580*
Fluorene	2,300,000	10,000,000	**390**	**200**	**240**	**463**	*323*	*200*	*463*
Indeno (1,2,3-c,d)pyrene	900	4,000	**1,800**	**910**	**1,200**	**1,790**	*1,425*	*910*	*1,800*
Naphthalene	230,000	4,200,000	**380**	**200**	**270**	**718**	*392*	*200*	*718*
Phenanthrene	NE	NE	**2,200**	**1,200**	**1,600**	**2,660**	*1,915*	*1,200*	*2,660*
Pyrene	1,700,000	10,000,000	**4,300**	**2,400**	**3,000**	**7,530**	*4,308*	*2,400*	*7,530*

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Treated Sediment						
	Field Sample Identification		TS-020506-1635	TS-030506-1635	TS-040506-1635	TS-040506-1635B	*Average*	*Min* -	*Max*
Analyte/Methods (Units)	**Sample Date / Sample Time**		5/2/06 1635	5/3/06 1635	5/4/06 1635	5/4/06 1635			
Dioxins and Furans/									
SW-846 8290 (pg/g)	**RDCSCC**	**NRDCSCC**							
1,2,3,4,6,7,8-HpCDD	NE	NE	--	**75**	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	NE	NE	--	**87**	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	NE	NE	--	**3.7 T**	--	--	--	--	--
1,2,3,4,7,8-HxCDD	NE	NE	--	**1 T**	--	--	--	--	--
1,2,3,4,7,8-HxCDF	NE	NE	--	**28**	--	--	--	--	--
1,2,3,6,7,8-HxCDD	NE	NE	--	**7.5 J**	--	--	--	--	--
1,2,3,6,7,8-HxCDF	NE	NE	--	**5.5 T**	--	--	--	--	--
1,2,3,7,8,9-HxCDD	NE	NE	--	**1.9 T**	--	--	--	--	--
1,2,3,7,8,9-HxCDF	NE	NE	--	**2.5 T**	--	--	--	--	--
1,2,3,7,8-PeCDD	NE	NE	--	**1.4 T**	--	--	--	--	--
1,2,3,7,8-PeCDF	NE	NE	--	**3 T**	--	--	--	--	--
2,3,4,6,7,8-HxCDF	NE	NE	--	**3 T**	--	--	--	--	--
2,3,4,7,8-PeCDF	NE	NE	--	**6.8 T**	--	--	--	--	--
2,3,7,8-TCDD	NE	NE	--	**58**	--	--	--	--	--
2,3,7,8-TCDF	NE	NE	--	**6.3**	--	--	--	--	--
OCDD	NE	NE	--	**630 B**	--	--	--	--	--
OCDF	NE	NE	--	**85**	--	--	--	--	--
Total Dioxins & Furans - summed by toxic equivalency factor (TEF) methodology	NE	NE	--	**70.19**	--	--	--	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Treated Sediment - portion from initial solids removal process (scalping screen)			
Field Sample Identification			TS1-020506-1620	TS1-030506-1620	TS1-040506-1620	TS1-040506-1620B
Analyte/Methods (Units)		Sample Date / Sample Time	5/2/06 1620	5/3/06 1620	5/4/06 1620	5/4/06 1620
	New Jersey Standards					
General Soil Parameters	**RDCSCC**	**NRDCSCC**				
Percent Solids/EPA 160.3 M (%)	NE	NE	**32.8**	**42.1**	**33**	**34.5**
Grain Size Sand/D4464 (%)	NE	NE	**89.72**	**87.21**	**87.62**	--
Grain Size Silt/D4464 (%)	NE	NE	**7.95**	**9.16**	**9.08**	--
Grain Size Clay/D4464 (%)	NE	NE	**2.32**	**3.62**	**3.29**	--
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**211,000**	**181,000**	**292,000**	**332,000**
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**6,720**	**6,510**	**8,840**	**33,000**
Metals/						
SW-846 6010B/7471A (mg/kg)	**RDCSCC**	**NRDCSCC**				
Arsenic	20	20	**15**	**11.6**	**12.6**	**15.7 B**
Barium	700	47,000	**171**	**142**	**210**	**345**
Cadmium	39	100	**3.8**	**3.7**	**5.9**	**7.55**
Chromium	120,000	NE	**127**	**106**	**152**	**213**
Lead	400	600	**484**	**420**	**635**	**648**
Nickel	250	2,400	**44.4**	**40.5**	**45.2**	**58.8**
Selenium	63	3,100	**2.9**	**0.9**	**1.5**	1.66 U
Silver	110	4,100	**1.8**	**1.9**	**2.8**	**3.46**
Zinc	1,500	1,500	**732 J**	**536**	**822 J**	**932**
Mercury	14	270	**2.9**	**2.8**	**3.7**	**3.48**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Treated Sediment - portion from initial solids removal process (scalping screen)			
	Field Sample Identification		TS1-020506-1620	TS1-030506-1620	TS1-040506-1620	TS1-040506-1620B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1620	5/3/06 1620	5/4/06 1620	5/4/06 1620
Polynuclear Aromatic Hydrocarbons (PAHs)/						
SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**				
Acenaphthene	3,400,000	10,000,000	**780**	**1,200**	**1,600**	**2,750**
Acenaphthylene	NE	NE	**2,300**	**3,100**	**3,700**	**4,570**
Anthracene	10,000,000	10,000,000	**2,700**	**4,700**	**6,300**	**8,420**
Benzo(a)anthracene	900	4,000	**7,400**	**9,900**	**15,000**	**16,100**
Benzo(a)pyrene	660	660	**6,500**	**9,700**	**15,000**	**17,200**
Benzo(b)fluoranthene	900	4,000	**6,200**	**9,800**	**14,000**	**12,300**
Benzo(ghi)perylene	NE	NE	**4,100**	**6,200**	**10,000**	**11,500**
Benzo(k)fluoranthene	900	4,000	**2,400**	**3,300**	**5,800**	**13,800**
Chrysene	9,000	40,000	**7,700**	**12,000**	**16,000**	**18,300**
Dibenzo(a,h)anthracene	660	660	**1,200**	**1,800**	**2,600**	**3,750**
Fluoranthene	2,300,000	10,000,000	**9,600**	**16,000**	**21,000**	**41,600**
Fluorene	2,300,000	10,000,000	**940**	**1,500**	**1,900**	**2,650**
Indeno (1,2,3-c,d)pyrene	900	4,000	**3,400**	**5,000**	**8,100**	**9,540**
Naphthalene	230,000	4,200,000	**630**	**790**	**1,300**	**3,370**
Phenanthrene	NE	NE	**5,500**	**9,200**	**13,000**	**19,100**
Pyrene	1,700,000	10,000,000	**9,800**	**13,000**	**20,000**	**42,900**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Treated Sediment - portion from second solids removal process (hydrocyclones)			
	Field Sample Identification		TS2-020506-1625	TS2-030506-1625	TS2-040506-1625	TS2-040506-1625B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1625	5/3/06 1625	5/4/06 1625	5/4/06 1625
	New Jersey Standards					
General Soil Parameters	RDCSCC	NRDCSCC				
Percent Solids/EPA 160.3 M (%)	NE	NE	**70.3**	**70.6**	**71.1**	**76.9**
Grain Size Sand/D4464 (%)	NE	NE	**80.01**	**80.11**	**70.66**	--
Grain Size Silt/D4464 (%)	NE	NE	**19.49**	**19.38**	**26.94**	--
Grain Size Clay/D4464 (%)	NE	NE	**0.5**	**0.51**	**2.4**	--
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**30,900**	**19,200**	**11,900**	**15,000**
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**1,940**	**1,540**	**1,100**	**3,200**
Metals/						
SW-846 6010B/7471A (mg/kg)	RDCSCC	NRDCSCC				
Arsenic	20	20	**4**	**2.5**	**2.7**	**5.21 B**
Barium	700	47,000	**88.6**	**59.3**	**65.8**	**345**
Cadmium	39	100	**1.8**	**1.4**	**1.8**	**2.04**
Chromium	120,000	NE	**59.6**	**28.4**	**33.4**	**79.5**
Lead	400	600	**274**	**150**	**180**	**167**
Nickel	250	2,400	**25.5**	**19.7**	**21.1**	**34.8**
Selenium	63	3,100	**1.2**	0.35 U	0.35 U	1.66 U
Silver	110	4,100	**1.3**	**1.6**	**1.6**	**1.93**
Zinc	1,500	1,500	**302 J**	**173**	**193 J**	**216**
Mercury	14	270	**1.1**	**0.99**	**1.2**	**0.829**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Treated Sediment - portion from second solids removal process (hydrocyclones)			
	Field Sample Identification		TS2-020506-1625	TS2-030506-1625	TS2-040506-1625	TS2-040506-1625B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1625	5/3/06 1625	5/4/06 1625	5/4/06 1625
Polynuclear Aromatic Hydrocarbons (PAHs)/ SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**				
Acenaphthene	3,400,000	10,000,000	**140**	**98**	**150**	**134**
Acenaphthylene	NE	NE	**370**	**220**	**280**	**197**
Anthracene	10,000,000	10,000,000	**560**	**380**	**570**	**487**
Benzo(a)anthracene	900	4,000	**1,600**	**1,000**	**1,700**	**1,030**
Benzo(a)pyrene	660	660	**1,500**	**1,100**	**1,600**	**1,190**
Benzo(b)fluoranthene	900	4,000	**1,600**	**1,200**	**1,900**	**1,010**
Benzo(ghi)perylene	NE	NE	**1,100**	**860**	**1,300**	**939**
Benzo(k)fluoranthene	900	4,000	**560**	**430**	**700**	**1,090**
Chrysene	9,000	40,000	**1,700**	**1,300**	**1,900**	**1,280**
Dibenzo(a,h)anthracene	660	660	**270**	**210**	**310**	**288**
Fluoranthene	2,300,000	10,000,000	**2,500**	**1,900**	**2,800**	**3,370**
Fluorene	2,300,000	10,000,000	**180**	**120**	**170**	**160**
Indeno (1,2,3-c,d)pyrene	900	4,000	**920**	**710**	**1,100**	**798**
Naphthalene	230,000	4,200,000	**120**	**87 T**	**140**	**233**
Phenanthrene	NE	NE	**1,300**	**860**	**1,300**	**1,170**
Pyrene	1,700,000	10,000,000	**2,300**	**1,700**	**2,600**	**3,210**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Treated Sediment - portion from initial solids removal process (centrifuge)			
	Field Sample Identification		TS3-020506-1630	TS3-030506-1630	TS3-040506-1630	TS3-040506-1630B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1630	5/3/06 1630	5/4/06 1630	5/4/06 1630
	New Jersey Standards					
General Soil Parameters	RDCSCC	NRDCSCC				
Percent Solids/EPA 160.3 M (%)	NE	NE	**63.6**	**66.6**	**65.3**	**66.6**
Grain Size Sand/D4464 (%)	NE	NE	**10.9**	**19.26**	**14.12**	--
Grain Size Silt/D4464 (%)	NE	NE	**67.94**	**63.14**	**64.77**	--
Grain Size Clay/D4464 (%)	NE	NE	**21.16**	**17.6**	**21.11**	--
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**49,100**	**42,000**	**46,800**	**48,600**
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**2,060**	**1,270**	**1,210**	**3,600**
Metals/						
SW-846 6010B/7471A (mg/kg)	RDCSCC	NRDCSCC				
Arsenic	20	20	**8**	**7.3**	**7.3**	**9.15 B**
Barium	700	47,000	**141**	**129**	**135**	**453**
Cadmium	39	100	**3.2**	**4.1**	**4.2**	**5.15**
Chromium	120,000	NE	**102**	**91.2**	**92.2**	**153**
Lead	400	600	**247**	**232**	**235**	**277**
Nickel	250	2,400	**39.3**	**36.3**	**37**	**55.9**
Selenium	63	3,100	**2.1**	**0.76**	0.38 U	1.66 U
Silver	110	4,100	**3.3**	**3**	**3**	**4.12**
Zinc	1,500	1,500	**406 J**	**352**	**371 J**	**479**
Mercury	14	270	**3.2**	**2.9**	**3**	**2.95**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Treated Sediment - portion from initial solids removal process (centrifuge)			
	Field Sample Identification		TS3-020506-1630	TS3-030506-1630	TS3-040506-1630	TS3-040506-1630B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1630	5/3/06 1630	5/4/06 1630	5/4/06 1630
Polynuclear Aromatic Hydrocarbons (PAHs)/						
SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**				
Acenaphthene	3,400,000	10,000,000	**290**	**170**	**200**	**355**
Acenaphthylene	NE	NE	**580**	**350**	**390**	**557**
Anthracene	10,000,000	10,000,000	**880**	**620**	**810**	**1,280**
Benzo(a)anthracene	900	4,000	**2,000**	**1,500**	**1,900**	**2,300**
Benzo(a)pyrene	660	660	**2,000**	**1,500**	**1,700**	**2,630**
Benzo(b)fluoranthene	900	4,000	**2,200**	**1,800**	**2,000**	**2,400**
Benzo(ghi)perylene	NE	NE	**1,700**	**1,200**	**1,500**	**2,190**
Benzo(k)fluoranthene	900	4,000	**1,100**	**630**	**820**	**2,450**
Chrysene	9,000	40,000	**2,500**	**2,100**	**2,300**	**2,970**
Dibenzo(a,h)anthracene	660	660	**460**	**290**	**340**	**651**
Fluoranthene	2,300,000	10,000,000	**3,500**	**2,900**	**3,300**	**7,240**
Fluorene	2,300,000	10,000,000	**340**	**210**	**250**	**478**
Indeno (1,2,3-c,d)pyrene	900	4,000	**1,400**	**990**	**1,100**	**1,780**
Naphthalene	230,000	4,200,000	**310**	**220**	**280**	**722**
Phenanthrene	NE	NE	**1,600**	**1,300**	**1,700**	**2,540**
Pyrene	1,700,000	10,000,000	**3,400**	**2,600**	**3,100**	**7,220**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Wastewater sludge			
	Field Sample Identification		WS-020506-1640	WS-030506-1640	WS-040506-1640	WS-040506-1640B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1640	5/3/06 1640	5/4/06 1640	5/4/06 1640
	New Jersey Standards					
General Soil Parameters	RDCSCC	NRDCSCC				
Percent Solids/EPA 160.3 M (%)	NE	NE	**27.2**	**26.2**	**24**	**31.2**
Grain Size Sand/D4464 (%)	NE	NE	**4.36**	**7.76**	**2.61**	--
Grain Size Silt/D4464 (%)	NE	NE	**72.86**	**72.82**	**79.02**	--
Grain Size Clay/D4464 (%)	NE	NE	**22.79**	**19.42**	**18.37**	--
Total Organic Carbon/Lloyd Kahn (mg/kg)	NE	NE	**123,000**	**130,000**	**122,000**	**109,000**
Total Petroleum Hydrocarbons/SW-846 9071	NE	NE	**6,770**	**1,900**	**2,770**	**4,600**
Metals/						
SW-846 6010B/7471A (mg/kg)	RDCSCC	NRDCSCC				
Arsenic	20	20	**21.2**	**20.5**	**21.4**	**30.2 B**
Barium	700	47,000	**339**	**311**	**341**	**690**
Cadmium	39	100	**12.8**	**13.3**	**15.6**	**19.6**
Chromium	120,000	NE	**465**	**436**	**455**	**639**
Lead	400	600	**604**	**591**	**687**	**888**
Nickel	250	2,400	**69.1**	**63.4**	**69.3**	**97.9**
Selenium	63	3,100	**4.9**	**2.2**	**1.5**	1.66 U
Silver	110	4,100	**16.4**	**15.7**	**16.7**	**22.1**
Zinc	1,500	1,500	**1290 J**	**1070**	**1230 J**	**1720**
Mercury	14	270	**9**	**9.3**	**9.6**	**9.29**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Wastewater sludge			
	Field Sample Identification		WS-020506-1640	WS-030506-1640	WS-040506-1640	WS-040506-1640B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1640	5/3/06 1640	5/4/06 1640	5/4/06 1640
Organochlorine Pesticides/ SW-846 8081A (µg/kg)	**RDCSCC**	**NRDCSCC**				
4,4'-DDD	3,000	12,000	--	**140 TJ**	--	--
4,4'-DDE	2,000	9,000	--	**97 T**	--	--
4,4'-DDT	2,000	9,000	--	**160**	--	--
Aldrin	40	170	--	*20 U*	--	--
alpha-BHC	NE	NE	--	160 U	--	--
alpha-Chlordane	NE	NE	--	160 U	--	--
beta-BHC	NE	NE	--	160 U	--	--
Chlordane (technical)	NE	NE	--	1600 U	--	--
delta-BHC	NE	NE	--	160 U	--	--
Dieldrin	42	180	--	**40 T**	--	--
Endosulfan I	340,000[a]	6,200,000[b]	--	160 U	--	--
Endosulfan II	340,000[a]	6,200,000[b]	--	**110 TJ**	--	--
Endosulfan sulfate	340,000[a]	6,200,000[b]	--	160 U	--	--
Endrin	17,000	310,000	--	**85 TJ**	--	--
Endrin aldehyde	NE	NE	--	160 U	--	--
Endrin ketone	NE	NE	--	160 U	--	--
gamma-BHC (Lindane)	520	2,200	--	160 U	--	--
gamma-Chlordane	NE	NE	--	160 U	--	--
Heptachlor	150	650	--	160 U	--	--
Heptachlor epoxide	NE	NE	--	160 U	--	--
Methoxychlor	280,000	5,200,000	--	320 U	--	--
Toxaphene	100	200	--	*220 U*	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Wastewater sludge			
Field Sample Identification			WS-020506-1640	WS-030506-1640	WS-040506-1640	WS-040506-1640B
Sample Date			5/2/06	5/3/06	5/4/06	5/4/06
Analyte/Methods (Units)	Sample Time		1640	1640	1640	1640
Poly Chlorinated Biphenyls (PCBs)/						
SW-846 8082 (µg/kg)	**RDCSCC**	**NRDCSCC**				
(BZ 1) 2-Chlorobiphenyl	NE	NE	--	**60 TJB**	--	--
(BZ 101) 2,2',4,5, 5'-Pentachlorobiphenyl	NE	NE	--	6.5 U	--	--
(BZ 110) 2,3,3',4',6-Pentachlorobiphenyl	NE	NE	--	**60**	--	--
(BZ 141) 2,2',3,4,5,5'-Hexachlorobiphenyl	NE	NE	--	**14**	--	--
(BZ 151) 2,2',3,5,5',6-Hexachlorobiphenyl	NE	NE	--	6.5 U	--	--
(BZ 153) 2,2',4,4',5,5'-Hexachlorobiphenyl	NE	NE	--	**43**	--	--
(BZ 170) 2,2',3,3',4,4',5-Heptachlorobiphen	NE	NE	--	**21**	--	--
(BZ 18) 2,2',5-Trichlorobiphenyl	NE	NE	--	**88**	--	--
(BZ 180) 2,2',3,4,4',5,5'-Heptachlorobiphen	NE	NE	--	**27 J**	--	--
(BZ 187) 2,2',3,4',5,5',6-Heptachlorobiphen	NE	NE	--	**26**	--	--
(BZ 206) 2,2',3,3',4,4',5,5',6-Nonachlorobip	NE	NE	--	**8.7**	--	--
(BZ 31) 2,4',5-Trichlorobiphenyl	NE	NE	--	**93**	--	--
(BZ 5) 2,3-Dichlorobiphenyl	NE	NE	--	**1.4 TJ**	--	--
(BZ 52) 2,2',5,5'-Tetrachlorobiphenyl	NE	NE	--	**79**	--	--
(BZ 66) 2,3',4,4'-Tetrachlorobiphenyl	NE	NE	--	**72**	--	--
(BZ 87) 2,2',3,4,5'-Pentachlorobiphenyl	NE	NE	--	**16 J**	--	--
Total PCB Congeners	490	2,000	--	**609.1**	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Wastewater sludge			
	Field Sample Identification		WS-020506-1640	WS-030506-1640	WS-040506-1640	WS-040506-1640B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1640	5/3/06 1640	5/4/06 1640	5/4/06 1640
Semi-Volatile Organic Compounds (SVOCs)/ SW-846 8270C (µg/kg)	**RDCSCC**	**NRDCSCC**				
1,4-Dichlorobenzene	570,000	10,000,000	--	**98 T**	--	--
2,4,5-Trichlorophenol	5,600,000	10,000,000	--	3200 U	--	--
2,4,6-Trichlorophenol	62,000	270,000	--	3200 U	--	--
2,4-Dinitrotoluene	1,000	4,000	--	*33 U*	--	--
2-Methylphenol	2,800,000	10,000,000	--	3200 U	--	--
3-Methylphenol & 4-Methylphenol	2,800,000	10,000,000	--	3200 U	--	--
Acenaphthene	3,400,000	10,000,000	--	**190 T**	--	--
Acenaphthylene	NE	NE	--	**360 T**	--	--
Anthracene	10,000,000	10,000,000	--	**520 T**	--	--
Benzo(a)anthracene	900	4,000	--	**910 T**	--	--
Benzo(a)pyrene	660	660	--	**860 T**	--	--
Benzo(b)fluoranthene	900	4,000	--	**1300 T**	--	--
Benzo(ghi)perylene	NE	NE	--	**360 T**	--	--
Benzo(k)fluoranthene	900	4,000	--	**510 T**	--	--
Chrysene	9,000	40,000	--	**1200 T**	--	--
Dibenz(a,h)anthracene	660	660	--	**95 T**	--	--
Fluoranthene	2,300,000	10,000,000	--	**2800 T**	--	--
Fluorene	2,300,000	10,000,000	--	**180 T**	--	--
Hexachlorobenzene	660	2,000	--	*64 U*	--	--
Hexachlorobutadiene	1,000	21,000	--	*62 U*	--	--
Hexachloroethane	6,000	100,000	--	3200 U	--	--
Indeno(1,2,3-cd)pyrene	900	4,000	--	**410 T**	--	--
Naphthalene	230,000	4,200,000	--	**170 T**	--	--
Nitrobenzene	28,000	520,000	--	3200 U	--	--
Pentachlorophenol	6,000	24,000	--	*4400 U*	--	--
Pyrene	1,700,000	10,000,000	--	**2100 T**	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

Location Identification			Wastewater sludge			
Field Sample Identification			WS-020506-1640	WS-030506-1640	WS-040506-1640	WS-040506-1640B
Analyte/Methods (Units)	Sample Date / Sample Time		5/2/06 1640	5/3/06 1640	5/4/06 1640	5/4/06 1640
Polynuclear Aromatic Hydrocarbons (PAHs)/ SW-846 8270 SIM (µg/kg)	**RDCSCC**	**NRDCSCC**				
Acenaphthene	3,400,000	10,000,000	**260 T**	**150 T**	**140**	**351**
Acenaphthylene	NE	NE	**590**	**320**	**290**	**490**
Anthracene	10,000,000	10,000,000	**770**	**450**	**480**	**992**
Benzo(a)anthracene	900	4,000	**1,400**	**960**	**810**	**1,490**
Benzo(a)pyrene	660	660	**1,400**	**900**	**840**	**1,660**
Benzo(b)fluoranthene	900	4,000	**2,000**	**1,300**	**1,200**	**1,870**
Benzo(ghi)perylene	NE	NE	**1,300**	**800**	**770**	**1,520**
Benzo(k)fluoranthene	900	4,000	**690**	**520**	**520**	**1,940**
Chrysene	9,000	40,000	**2,000**	**1,300**	**1,200**	**2,130**
Dibenzo(a,h)anthracene	660	660	**290 T**	**180 T**	**170**	**425**
Fluoranthene	2,300,000	10,000,000	**3,100**	**2,100**	**1,900**	**6,040**
Fluorene	2,300,000	10,000,000	**270 T**	**170 T**	**140**	**352**
Indeno (1,2,3-c,d)pyrene	900	4,000	**1,000**	**670**	**630**	**1,320**
Naphthalene	230,000	4,200,000	**220 T**	**130 T**	**140**	**385**
Phenanthrene	NE	NE	**1,000**	**650**	**660**	**1,520**
Pyrene	1,700,000	10,000,000	**3,000**	**2,000**	**1,700**	**6,320**

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

	Location Identification		Wastewater sludge			
	Field Sample Identification		WS-020506-1640	WS-030506-1640	WS-040506-1640	WS-040506-1640B
	Sample Date		5/2/06	5/3/06	5/4/06	5/4/06
Analyte/Methods (Units)	Sample Time		1640	1640	1640	1640
Dioxins and Furans/						
SW-846 8290 (pg/g)	**RDCSCC**	**NRDCSCC**				
1,2,3,4,6,7,8-HpCDD	NE	NE	--	**120**	--	--
1,2,3,4,6,7,8-HpCDF	NE	NE	--	**170**	--	--
1,2,3,4,7,8,9-HpCDF	NE	NE	--	**4.2 T**	--	--
1,2,3,4,7,8-HxCDD	NE	NE	--	**1 T**	--	--
1,2,3,4,7,8-HxCDF	NE	NE	--	**37**	--	--
1,2,3,6,7,8-HxCDD	NE	NE	--	**7.3 T**	--	--
1,2,3,6,7,8-HxCDF	NE	NE	--	**7.9 T**	--	--
1,2,3,7,8,9-HxCDD	NE	NE	--	**3.2 T**	--	--
1,2,3,7,8,9-HxCDF	NE	NE	--	20 U	--	--
1,2,3,7,8-PeCDD	NE	NE	--	20 U	--	--
1,2,3,7,8-PeCDF	NE	NE	--	**2.3 T**	--	--
2,3,4,6,7,8-HxCDF	NE	NE	--	**4.8 T**	--	--
2,3,4,7,8-PeCDF	NE	NE	--	**7.6 T**	--	--
2,3,7,8-TCDD	NE	NE	--	**57**	--	--
2,3,7,8-TCDF	NE	NE	--	**4**	--	--
OCDD	NE	NE	--	**1700 B**	--	--
OCDF	NE	NE	--	**140**	--	--
Total Dioxins & Furans - summed by toxic equivalency factor (TEF) methodology	NE	NE	--	**72.22**	--	--

TABLE 1
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT

NOTES:

g	gram(s)
pg/g	picogram(s) per gram
µg/kg	microgram(s) per kilogram
mg/kg	milligram(s) per kilogram
AD	Air dried
Dup	Duplicate
NRDCSCC	Non-residential direct contact soil cleanup criteria
RDCSCC	Residential direct contact soil cleanup criteria
NON-RES	Non-residential
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
RES	Residential
RR	Rerun
SVOC	Semi-volatile organic compound
TEF	Toxicity Equivalency Factor
a	The sum of endosulfan I, endosulfan II, and endosulfan sulfate may not exceed 340,000 µg/kg.
b	The sum of endosulfan I, endosulfan II, and endosulfan sulfate may not exceed 6,200,000 µg/kg.
Bold	Bolded result indicates positively identified analyte.
Italics	Italicized result indicates the sample is reported to the method detection limit (MDL)
Shading	Shading indicates a result or reporting limit greater than the RDCSCC or NRDCSCC
--	Not scheduled
B	Analyte detected in associated blank
J	Data are estimated due to associated quality control data.
NE	Not established
NR	Not regulated in pathway
Q	Estimated maximum possible concentration (EMPC)
T	Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
U	Analyte not detected above the method detection limit.
UB	Analyte considered not detected based on associated blank data.
UJ	Potential low bias, possible false negative.

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Rev 2

Analyte/Methods (Units)	New Jersey Standards RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL01-040107-0905	MSL02-040107-0925	MSL03-040107-0940	MSL04-040107-0950
				Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
				Sample Time	9:05	9:25	9:40	9:50
General Soil Parameters MCAWW 160.3M/ASTM D4464/ Lloyd Kahn/SW-846 9071B								
Percent Solids (%)	NE	NE	NE		**80.4 %**	**80.2 %**	**76.9 %**	**80.3 %**
Grain Size Sand (%)	NE	NE	NE		**9.32 %**	**14.2 %**	**12.78 %**	**12.40 %**
Grain Size Silt (%)	NE	NE	NE		**65.61 %**	**61.91 %**	**62.61 %**	**63.06 %**
Grain Size Clay (%)	NE	NE	NE		**25.07 %**	**23.89 %**	**24.61 %**	**24.53 %**
Total Organic Carbon (mg/kg)	NE	NE	NE		**22,200**	**22,400**	**25,900**	**36,000**
Total Petroleum Hydrocarbons (mg/kg)	NE	NE	NE		**767**	**619**	**672**	**598**
Inorganics/Metals (mg/kg) SW-846 6010B/7471A/7196A/9012A								
Silver	110	4,100	NE		**0.97**	**1.0**	**1.2**	**0.99**
Arsenic	20	20	NE		**7.5**	**8.4**	**8.6**	**7.9**
Barium	700	47,000	NE		**81.6**	**96.9**	**102**	**92.6**
Cadmium	39	100	NE		**0.98**	**1.0**	**1.0**	**1.0**
Chromium (total)	NE	NE	NE		**36.0 N**	**35.5 N**	**39.1 N**	**36.9 N**
Nickel	250	2,400	NE		**15.5**	**17.3**	**17.8**	**16.6**
Lead	400	600	NE		**80.9**	**85.3**	**89.9**	**84.8**
Selenium	63	3,100	NE		**0.69**	**0.63**	**0.60**	**0.72**
Zinc	1,500	1,500	NE		**143 E**	**147 E**	**150 E**	**139 E**
Mercury	14	270	NE		**1.4**	**1.7**	**1.8**	**1.6**
Cyanide, total	1100	21,000	NE		0.62 U	0.62 U	**6.3**	0.62 U

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Rev 2

	Field Sample Identification			MSL01-040107-0905	MSL02-040107-0925	MSL03-040107-0940	MSL04-040107-0950
			Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
Analyte/Methods (Units)			**Sample Time**	9:05	9:25	9:40	9:50
TCLP Metals (mg/L)							
SW-846 6010B/7471A/7196A/9012A	**RDCSCC**	**NRDCSCC**	**IGSCC**				
Silver	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U
Arsenic	-	-	-	**0.21 T**	**0.21 T**	**0.21 T**	**0.22 T**
Barium	-	-	-	**0.18 T**	**0.21 T**	**0.19 T**	**0.20 T**
Cadmium	-	-	-	**0.014 T**	**0.0091 T**	**0.015 T**	**0.012 T**
Chromium (total)	-	-	-	**0.0046 T**	**0.0051 T**	**0.0055 T**	**0.0042 T**
Lead	-	-	-	**0.044 T**	**0.058 T**	**0.053 T**	**0.058 T**
Selenium	-	-	-	0.25 U	0.25 U	0.25 U	0.25 U
Mercury	-	-	-	0.00020 U	**0.00009 T**	**0.00005 T**	0.00020 U

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

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Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL01-040107-0905	MSL02-040107-0925	MSL03-040107-0940	MSL04-040107-0950
				Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
				Sample Time	9:05	9:25	9:40	9:50
Organochlorine Pesticides (µg/kg)								
SW-846 8081A								
Chlordane (technical)	NE	NE	NE		53 U	53 U	55 U	53 U
alpha-BHC	NE	NE	NE		5.3 U	5.3 U	5.5 U	5.3 U
beta-BHC	NE	NE	NE		5.3 U	5.3 U	5.5 U	5.3 U
delta-BHC	NE	NE	NE		5.3 U	5.3 U	5.5 U	5.3 U
gamma-BHC (Lindane)	520	2,200	50,000		5.3 U	5.3 U	5.5 U	5.3 U
Heptachlor	150	650	50,000		5.3 U	5.3 U	5.5 U	5.3 U
Aldrin	40	170	50,000		5.3 U	5.3 U	5.5 U	5.3 U
Heptachlor epoxide	NE	NE	NE		**1.8 T, PG**	**1.2 T, PG**	**1.1 T, PG**	**0.78 T, PG**
Endosulfan I	340,000[a]	6,200,000[b]	50,000[c]		5.3 U	5.3 U	5.5 U	5.3 U
Dieldrin	42	180	50,000		5.3 U	5.3 U	5.5 U	5.3 U
4,4'-DDE	2,000	9,000	50,000		**36**	**35**	**36**	**28**
Endrin	17,000	310,000	50,000		**3.7 T**	**2.9 T, PG**	**0.71 T, PG**	**0.96 T, PG**
Endrin ketone	NE	NE	NE		5.3 U	5.3 U	5.5 U	5.3 U
Endrin aldehyde	NE	NE	NE		**4.0 T, PG**	**8.2 PG**	**6.6**	**3.1 T, PG**
Endosulfan II	340,000[a]	6,200,000[b]	50,000[c]		5.3 U	5.3 U	5.5 U	5.3 U
4,4'-DDD	3,000	12,000	50,000		**38 PG**	**39 PG**	**35 PG**	**65 PG**
Endosulfan sulfate	340,000[a]	6,200,000[b]	50,000[c]		5.3 U	5.3 U	5.5 U	5.3 U
4,4'-DDT	2,000	9,000	500,000		**49**	**40**	**38**	**32**
Methoxychlor	280,000	5,200,000	50,000		**83**	**64**	**88**	**48**
alpha-Chlordane	NE	NE	NE		**8.1**	**7.8**	**3.5 T, PG**	**3.6 T, PG**
gamma-Chlordane	NE	NE	NE		5.3 U	5.3 U	**3.3 T, PG**	5.3 U
Toxaphene	100	200	50,000		*7.0 U*	*7.1 U*	*7.4 U*	*7.0 U*

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TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL01-040107-0905	MSL02-040107-0925	MSL03-040107-0940	MSL04-040107-0950
				Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
				Sample Time	9:05	9:25	9:40	9:50
Semi-Volatile Organic Compounds (µg/kg)								
SW-846 8270C								
Acenaphthene	3,400,000	10,000,000	100,000		**87 T**	**76 T**	**110 T**	**63 T**
Acenaphthylene	NE	NE	NE		**240 T**	**150 T**	**210 T**	**140 T**
Anthracene	10,000,000	10,000,000	100,000		**360 T**	**200 T**	**270 T**	**180 T**
Benzo(a)anthracene	900	4,000	500,000		**860 T**	**440 T**	**580 T**	**420 T**
Benzo(b)fluoranthene	900	4,000	50,000		**790 T**	**440 T**	**560 T**	**380 T**
Benzo(k)fluoranthene	900	4,000	500,000		**380 T**	**180 T**	**240 T**	**150 T**
Benzo(ghi)perylene	NE	NE	NE		**540 T**	**360 T**	**440 T**	**330 T**
Benzo(a)pyrene	660	660	100,000		**750 T**	**450 T**	**540 T**	**370 T**
Chrysene	9,000	40,000	500,000		**1,100 T**	**620 T**	**760 T**	**560 T**
Dibenz(a,h)anthracene	660	660	100,000		**120 T**	*34 U*	35 U	34 U
1,4-Dichlorobenzene	570,000	10,000,000	100,000		**65 T**	**49 T**	**54 T**	**43 T**
2,4-Dinitrotoluene	1,000	4,000	10,000		*22 U*	*22 U*	*23 U*	*22 U*
Fluoranthene	2,300,000	10,000,000	100,000		**1,400 T**	**660 T**	**960 T**	**640 T**
Fluorene	2,300,000	10,000,000	10,000		**150 T**	**97 T**	**150 T**	**89 T**
Hexachlorobenzene	660	2,000	100,000		*42 U*	*42 U*	*44 U*	*42 U*
Hexachlorobutadiene	1,000	21,000	100,000		*41 U*	*41 U*	*42 U*	*41 U*
Hexachloroethane	6,000	100,000	100,000		2,100 U	2,100 U	2,100 U	2,100 U
Indeno(1,2,3-cd)pyrene	900	4,000	500,000		**500 T**	**280 T**	**370 T**	**250 T**
2-Methylphenol	2,800,000	10,000,000	NE		2,100 U	2,100 U	2,100 U	2,100 U
3 and 4-Methylphenol	2,800,000	10,000,000	NE		2,100 U	2,100 U	2,100 U	2,100 U
Naphthalene	230,000	4,200,000	100,000		**110 T**	**89 T**	**110 T**	**84 T**
Nitrobenzene	28,000	520,000	10,000		2,100 U	2,100 U	2,100 U	2,100 U
Pentachlorophenol	6,000	24,000	100,000		*2,800 U*	*2,800 U*	*3,000 U*	*2,800 U*
Pyrene	1,700,000	10,000,000	100,000		**1,400 T**	**730 T**	**970 T**	**670 T**
2,4,5-Trichlorophenol	5,600,000	10,000,000	50,000		2,100 U	2,100 U	2,100 U	2,100 U
2,4,6-Trichlorophenol	62,000	270,000	10,000		2,100 U	2,100 U	2,100 U	2,100 U

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TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL01-040107-0905	MSL02-040107-0925	MSL03-040107-0940	MSL04-040107-0950
				Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
				Sample Time	9:05	9:25	9:40	9:50
Polynuclear Aromatic Hydrocarbons µg/kg)								
Acenaphthene	3,400,000	10,000,000	100,000		**94**	**68**	**130**	**79**
Acenaphthylene	NE	NE	NE		**230**	**140**	**260**	**180**
Anthracene	10,000,000	10,000,000	100,000		**350**	**180**	**340**	**220**
Benzo(a)anthracene	900	4,000	500,000		**900**	**430**	**680**	**480**
Benzo(b)fluoranthene	900	4,000	50,000		**1,000**	**530**	**930**	**580**
Benzo(k)fluoranthene	900	4,000	500,000		**460**	**240**	**300**	**270**
Benzo(ghi)perylene	NE	NE	NE		**680**	**420**	**670**	**460**
Benzo(a)pyrene	660	660	100,000		**870**	**480**	**780**	**520**
Chrysene	9,000	40,000	500,000		**1,000**	**510**	**800**	**600**
Dibenzo(a,h)anthracene	660	660	100,000		**190**	**110**	**170**	**120**
Fluoranthene	2,300,000	10,000,000	100,000		**1,100**	**680**	**1,200**	**820**
Fluorene	2,300,000	10,000,000	100,000		**130**	**86**	**150**	**96**
Indeno (1,2,3-c,d)pyrene	900	4,000	500,000		**570**	**340**	**550**	**370**
Naphthalene	230,000	4,200,000	100,000		**100**	**72**	**120**	**86**
Phenanthrene	NE	NE	NE		**630**	**430**	**800**	**490**
Pyrene	1,700,000	10,000,000	100,000		**1,300**	**760**	**1,200**	**860**

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

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Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL01-040107-0905	MSL02-040107-0925	MSL03-040107-0940	MSL04-040107-0950
				Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
				Sample Time	9:05	9:25	9:40	9:50
Polychlorinated Biphenyls (µg/kg) SW-846 8082 (Congeners)								
PCB 1 (BZ)	NE	NE	NE		**6.0 T, PG**	**13**	**6.0 T, PG**	**7.5 T, PG**
PCB 5 (BZ)	NE	NE	NE		**6.5 PG**	**9.1**	**1.9 PG**	**1.8 PG**
PCB 18 (BZ)	NE	NE	NE		**11**	**9.9**	**10**	**8.1**
PCB 31 (BZ)	NE	NE	NE		**19**	**18**	**14**	**14**
PCB 52 (BZ)	NE	NE	NE		**14**	**14**	**13**	**11**
PCB 66 (BZ)	NE	NE	NE		**11**	**9.9**	**7.1 PG**	**7.6**
PCB 87 (BZ)	NE	NE	NE		**3.3 PG**	**3.7 PG**	**2.5 PG**	**2.2 PG**
PCB 101 (BZ)	NE	NE	NE		**12**	**14**	**11**	**9.3**
PCB 110 (BZ)	NE	NE	NE		**9.1 PG**	**10 PG**	**7.8 PG**	**6.6 PG**
PCB 141 (BZ)	NE	NE	NE		**2.4**	**2.4**	**2.1**	**1.6**
PCB 151 (BZ)	NE	NE	NE		1.1 U	1.1 U	1.1 U	1.1 U
PCB 153 (BZ)	NE	NE	NE		**8.8 PG**	**12**	**7.4 PG**	**6.0 PG**
PCB 170 (BZ)	NE	NE	NE		**4.6**	**4.3**	**4.0**	**3.0**
PCB 180 (BZ)	NE	NE	NE		**9.0**	**8.3**	**8.3**	**6.1**
PCB 187 (BZ)	NE	NE	NE		**5.3**	**4.7**	**3.4 PG**	**3.5**
PCB 206 (BZ)	NE	NE	NE		**1.8**	**3.0**	**2.0**	**1.4**
Total PCBs (calculated)	490	2,000	50,000		**123.8**	**136.3**	**100.5**	**89.7**

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Rev 2

Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	Sample Date / Sample Time	MSL01-040107-0905	MSL02-040107-0925	MSL03-040107-0940	MSL04-040107-0950
						1/4/07 9:05	1/4/07 9:25	1/4/07 9:40	1/4/07 9:50
Dioxins and Furans (pg/g) SW-846 8280									
2,3,7,8-TCDD	NE	NE	NE			**42**	**50**	**47**	**21**
1,2,3,7,8-PeCDD	NE	NE	NE			**1.2 Q,T**	**1.5 Q,T**	**1.4 T**	**1.1 Q,T**
1,2,3,4,7,8-HxCDF	NE	NE	NE			**20 Q**	**1.4 Q,T**	**1.4 T**	**2.7 T**
1,2,3,6,7,8-HxCDD	NE	NE	NE			**6.0**	**8.1**	**7.5**	**16**
1,2,3,7,8,9-HxCDD	NE	NE	NE			**0.36 Q,T**	**5.2**	**3.8 T**	**11**
1,2,3,4,6,7,8-HpCDD	NE	NE	NE			**100**	**130**	**110**	**800**
OCDD	NE	NE	NE			**1,400 B**	**1,700 B**	**1,500 B**	**7,600 B,E**
2,3,7,8-TCDF	NE	NE	NE			**4.2 Q,T**	**38 Q**	**35 Q**	**26 Q**
1,2,3,7,8-PeCDF	NE	NE	NE			**2.3 T**	**3.0 T**	**2.4 Q,T**	**3.1 Q,T**
2,3,4,7,8-PeCDF	NE	NE	NE			**5.3 Q**	**6.7**	**6.7**	**5.4**
1,2,3,4,7,8-HxCDD	NE	NE	NE			**1.1 Q,T**	**24 Q**	**22 Q**	**18 Q**
1,2,3,6,7,8-HxCDF	NE	NE	NE			**5.8**	**6.3**	**5.8**	**7.4**
2,3,4,6,7,8-HxCDF	NE	NE	NE			**2.7 T**	**3.6 T**	**3.2 Q,T**	**4.5 T**
1,2,3,7,8,9-HxCDF	NE	NE	NE			**0.57 T**	**0.84 Q,T**	5.0 U	**0.37 Q,T**
1,2,3,4,6,7,8-HpCDF	NE	NE	NE			**72 Q**	**83**	**89**	**75**
1,2,3,4,7,8,9-HpCDF	NE	NE	NE			**3.7 Q,T**	**4.1 Q,T**	**5.0 Q,T**	**4.2 T**
OCDF	NE	NE	NE			**100**	**110**	**110**	**86**
TEQ (calculated using 2005 WHO Factors)						**51**	**65**	**61**	**44**

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Rev 2

	Field Sample Identification			MSL05-040107-1000	MSL06-040107-1015	MSL07-040107-1025	MSL08-040107-1035
				Sample Date 1/4/07	1/4/07	1/4/07	1/4/07
Analyte/Methods (Units)				Sample Time 10:00	10:15	10:25	10:35
General Soil Parameters	**New Jersey Standards**						
MCAWW 160.3M/ASTM D4464/ Lloyd Kahn/SW-846 9071B	**RDCSCC**	**NRDCSCC**	**IGSCC**				
Percent Solids (%)	NE	NE	NE	**81.9 %**	**81.9 %**	**80.3 %**	**80.1 %**
Grain Size Sand (%)	NE	NE	NE	**21.31 %**	**16.00 %**	**15.57 %**	**18.18 %**
Grain Size Silt (%)	NE	NE	NE	**57.32 %**	**61.25 %**	**61.84 %**	**58.91 %**
Grain Size Clay (%)	NE	NE	NE	**21.37 %**	**22.75 %**	**22.58 %**	**22.91 %**
Total Organic Carbon (mg/kg)	NE	NE	NE	**22,600**	**25,800**	**20,100**	**21,800**
Total Petroleum Hydrocarbons (mg/kg)	NE	NE	NE	**599**	**380**	**407**	**275**
Inorganics/Metals (mg/kg)							
SW-846 6010B/7471A/7196A/9012A	**RDCSCC**	**NRDCSCC**	**IGSCC**				
Silver	110	4,100	NE	**0.89**	**1.1**	**0.87**	**0.94**
Arsenic	20	20	NE	**7.7**	**9.3**	**8.1**	**7.5**
Barium	700	47,000	NE	**89.1**	**103**	**82.1**	**83.9**
Cadmium	39	100	NE	**0.92**	**1.0**	**0.89**	**0.89**
Chromium (total)	NE	NE	NE	**35.0 N**	**40.2 N**	**38.2 N**	**33.4 N**
Nickel	250	2,400	NE	**16.2**	**17.7**	**14.6**	**16.0**
Lead	400	600	NE	**77.3**	**92.8**	**77.5**	**80.3**
Selenium	63	3,100	NE	**0.59**	**0.60**	**0.62**	**0.55**
Zinc	1,500	1,500	NE	**127 E**	**174 E**	**149 E**	**147 E**
Mercury	14	270	NE	**1.5**	**1.8**	**1.5**	**1.7**
Cyanide, total	1100	21,000	NE	0.61 U	0.64 U	0.62 U	0.62 U

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Rev 2

	Field Sample Identification			MSL05-040107-1000	MSL06-040107-1015	MSL07-040107-1025	MSL08-040107-1035
			Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
Analyte/Methods (Units)			**Sample Time**	10:00	10:15	10:25	10:35
TCLP Metals (mg/L) SW-846 6010B/7471A/7196A/9012A	**RDCSCC**	**NRDCSCC**	**IGSCC**				
Silver	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U
Arsenic	-	-	-	**0.22 T**	**0.20 T**	**0.22 T**	**0.22 T**
Barium	-	-	-	**0.21 T**	**0.21 T**	**0.19 T**	**0.19 T**
Cadmium	-	-	-	**0.012 T**	**0.015 T**	**0.0076 T**	**0.0099 T**
Chromium (total)	-	-	-	**0.0057 T**	**0.0054 T**	**0.0055 T**	**0.0042 T**
Lead	-	-	-	**0.057 T**	**0.052 T**	**0.058 T**	**0.061 T**
Selenium	-	-	-	0.25 U	0.25 U	0.25 U	0.25 U
Mercury	-	-	-	0.00020 U	0.00020 U	**0.00007 T**	0.00020 U

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
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Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL05-040107-1000	MSL06-040107-1015	MSL07-040107-1025	MSL08-040107-1035
				Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
				Sample Time	10:00	10:15	10:25	10:35
Organochlorine Pesticides (µg/kg) SW-846 8081A								
Chlordane (technical)	NE	NE	NE		52 U	55 U	530 U	53 U
alpha-BHC	NE	NE	NE		5.2 U	5.5 U	53 U	5.3 U
beta-BHC	NE	NE	NE		5.2 U	5.5 U	53 U	5.3 U
delta-BHC	NE	NE	NE		5.2 U	5.5 U	53 U	5.3 U
gamma-BHC (Lindane)	520	2,200	50,000		5.2 U	5.5 U	53 U	5.3 U
Heptachlor	150	650	50,000		5.2 U	5.5 U	53 U	5.3 U
Aldrin	40	170	50,000		**1.1 T, PG**	5.5 U	*6.6 U*	5.3 U
Heptachlor epoxide	NE	NE	NE		**1.1 T, PG**	**1.3 T, PG**	53 U	**0.83 T, PG**
Endosulfan I	340,000[a]	6,200,000[b]	50,000[c]		5.2 U	5.5 U	53 U	5.3 U
Dieldrin	42	180	50,000		5.2 U	5.5 U	*5.0 U*	5.3 U
4,4'-DDE	2,000	9,000	50,000		**32**	**33**	**19 T**	**27**
Endrin	17,000	310,000	50,000		**0.71 T, PG**	**3.3 T, PG**	53 U	**1.5 T, PG**
Endrin ketone	NE	NE	NE		5.2 U	5.5 U	53 U	5.3 U
Endrin aldehyde	NE	NE	NE		**6.4**	**8.3**	53 U	**8.5**
Endosulfan II	340,000[a]	6,200,000[b]	50,000[c]		5.2 U	5.5 U	53 U	5.3 U
4,4'-DDD	3,000	12,000	50,000		**34 PG**	**39 PG**	**36 T, PG**	**28 PG**
Endosulfan sulfate	340,000[a]	6,200,000[b]	50,000[c]		5.2 U	5.5 U	53 U	5.3 U
4,4'-DDT	2,000	9,000	500,000		**42**	**34**	**30 T, PG**	**69**
Methoxychlor	280,000	5,200,000	50,000		**100**	**63**	**1,100**	**42**
alpha-Chlordane	NE	NE	NE		5.2 U	**7.4**	53 U	**2.9 T, PG**
gamma-Chlordane	NE	NE	NE		**2.2 T, PG**	**5.9**	53 U	**1.9 T, PG**
Toxaphene	100	200	50,000		*6.9 U*	*7.3 U*	*70 U*	*7.1 U*

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Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL05-040107-1000	MSL06-040107-1015	MSL07-040107-1025	MSL08-040107-1035
				Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
				Sample Time	10:00	10:15	10:25	10:35
Semi-Volatile Organic Compounds (µg/kg)								
SW-846 8270C								
Acenaphthene	3,400,000	10,000,000	100,000		**67 T**	**94 T**	**73 T**	**69 T**
Acenaphthylene	NE	NE	NE		**200 T**	**230 T**	**170 T**	**160 T**
Anthracene	10,000,000	10,000,000	100,000		**190 T**	**240 T**	**180 T**	**170 T**
Benzo(a)anthracene	900	4,000	500,000		**490 T**	**550 T**	**460 T**	**420 T**
Benzo(b)fluoranthene	900	4,000	50,000		**450 T**	**470 T**	**380 T**	**350 T**
Benzo(k)fluoranthene	900	4,000	500,000		**220 T**	**200 T**	**180 T**	**160 T**
Benzo(ghi)perylene	NE	NE	NE		**400 T**	**330 T**	**230 T**	**220 T**
Benzo(a)pyrene	660	660	100,000		**460 T**	**480 T**	**390 T**	**360 T**
Chrysene	9,000	40,000	500,000		**650 T**	**690 T**	**590 T**	**530 T**
Dibenz(a,h)anthracene	660	660	100,000		33 U	35 U	34 U	34 U
1,4-Dichlorobenzene	570,000	10,000,000	100,000		**45 T**	**55 T**	2,100 U	2,100 U
2,4-Dinitrotoluene	1,000	4,000	10,000		*21 U*	*22 U*	*22 U*	*22 U*
Fluoranthene	2,300,000	10,000,000	100,000		**770 T**	**870 T**	**790 T**	**630 T**
Fluorene	2,300,000	10,000,000	10,000		**96 T**	**110 T**	**94 T**	**92 T**
Hexachlorobenzene	660	2,000	100,000		*41 U*	*43 U*	*42 U*	*42 U*
Hexachlorobutadiene	1,000	21,000	100,000		*40 U*	*42 U*	*41 U*	*41 U*
Hexachloroethane	6,000	100,000	100,000		2,000 U	2,100 U	2,100 U	2,100 U
Indeno(1,2,3-cd)pyrene	900	4,000	500,000		**310 T**	**300 T**	**250 T**	**200 T**
2-Methylphenol	2,800,000	10,000,000	NE		2,000 U	2,100 U	2,100 U	2,100 U
3 and 4-Methylphenol	2,800,000	10,000,000	NE		2,000 U	2,100 U	2,100 U	2,100 U
Naphthalene	230,000	4,200,000	100,000		**93 T**	**110 T**	**83 T**	**75 T**
Nitrobenzene	28,000	520,000	10,000		2,000 U	2,100 U	2,100 U	2,100 U
Pentachlorophenol	6,000	24,000	100,000		*2,800 U*	*2,900 U*	*2,800 U*	*2,900 U*
Pyrene	1,700,000	10,000,000	100,000		**740 T**	**850 T**	**690 T**	**630 T**
2,4,5-Trichlorophenol	5,600,000	10,000,000	50,000		2,000 U	2,100 U	2,100 U	2,100 U
2,4,6-Trichlorophenol	62,000	270,000	10,000		2,000 U	2,100 U	2,100 U	2,100 U

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Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL05-040107-1000	MSL06-040107-1015	MSL07-040107-1025	MSL08-040107-1035
				Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
				Sample Time	10:00	10:15	10:25	10:35
Polynuclear Aromatic Hydrocarbons µg/kg)								
Acenaphthene	3,400,000	10,000,000	100,000		**87**	**91**	**94**	**87**
Acenaphthylene	NE	NE	NE		**230**	**220**	**210**	**190**
Anthracene	10,000,000	10,000,000	100,000		**270**	**250**	**270**	**230**
Benzo(a)anthracene	900	4,000	500,000		**590**	**630**	**620**	**530**
Benzo(b)fluoranthene	900	4,000	50,000		**690**	**830**	**760**	**730**
Benzo(k)fluoranthene	900	4,000	500,000		**330**	**360**	**350**	**240**
Benzo(ghi)perylene	NE	NE	NE		**630**	**600**	**620**	**550**
Benzo(a)pyrene	660	660	100,000		**640**	**670**	**690**	**600**
Chrysene	9,000	40,000	500,000		**710**	**680**	**750**	**640**
Dibenzo(a,h)anthracene	660	660	100,000		**160**	**150**	**150**	**140**
Fluoranthene	2,300,000	10,000,000	100,000		**950**	**990**	**1,100**	**870**
Fluorene	2,300,000	10,000,000	100,000		**110**	**120**	**120**	**110**
Indeno (1,2,3-c,d)pyrene	900	4,000	500,000		**480**	**490**	**500**	**440**
Naphthalene	230,000	4,200,000	100,000		**110**	**110**	**97**	**90**
Phenanthrene	NE	NE	NE		**540**	**570**	**670**	**520**
Pyrene	1,700,000	10,000,000	100,000		**910**	**1,100**	**1,100**	**950**

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Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	Sample Date / Sample Time	MSL05-040107-1000	MSL06-040107-1015	MSL07-040107-1025	MSL08-040107-1035
						1/4/07 10:00	1/4/07 10:15	1/4/07 10:25	1/4/07 10:35
Polychlorinated Biphenyls (µg/kg) SW-846 8082 (Congeners)									
PCB 1 (BZ)	NE	NE	NE			**5.3 T, PG**	**8.9 T, PG**	**5.7 T, PG**	**5.9 T, PG**
PCB 5 (BZ)	NE	NE	NE			**1.5 PG**	**1.8 PG**	**1.4 PG**	**1.5 PG**
PCB 18 (BZ)	NE	NE	NE			**8.2**	**10**	**7.6**	**8.5**
PCB 31 (BZ)	NE	NE	NE			**13**	**16**	**12**	**14**
PCB 52 (BZ)	NE	NE	NE			**11**	**13**	**9.7**	**11**
PCB 66 (BZ)	NE	NE	NE			**5.6**	**7.3 PG**	**7.2**	**8.1**
PCB 87 (BZ)	NE	NE	NE			**2.1 PG**	**2.5 PG**	**2.0**	**2.4 PG**
PCB 101 (BZ)	NE	NE	NE			**8.5**	**10**	**8.0**	**9.8**
PCB 110 (BZ)	NE	NE	NE			**6.3 PG**	**7.9 PG**	**6.1 PG**	**7.0 PG**
PCB 141 (BZ)	NE	NE	NE			**1.6**	**2.1**	**1.7**	**1.7**
PCB 151 (BZ)	NE	NE	NE			1.0 U	1.1 U	1.1 U	1.1 U
PCB 153 (BZ)	NE	NE	NE			**5.9 PG**	**7.3 PG**	**6.1 PG**	**6.6 PG**
PCB 170 (BZ)	NE	NE	NE			**2.8**	**2.7 PG**	**3.4**	**3.0**
PCB 180 (BZ)	NE	NE	NE			**5.8**	**5.5 PG**	**6.9**	**6.2**
PCB 187 (BZ)	NE	NE	NE			**3.5**	**3.2 PG**	**4.0**	**3.8**
PCB 206 (BZ)	NE	NE	NE			**1.1 PG**	**1.8**	**1.6**	**1.7**
Total PCBs (calculated)	490	2,000	50,000			**82.2**	**100.0**	**83.4**	**91.2**

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	Field Sample Identification			MSL05-040107-1000	MSL06-040107-1015	MSL07-040107-1025	MSL08-040107-1035
			Sample Date	1/4/07	1/4/07	1/4/07	1/4/07
Analyte/Methods (Units)			**Sample Time**	10:00	10:15	10:25	10:35
Dioxins and Furans (pg/g)							
SW-846 8280	**RDCSCC**	**NRDCSCC**	**IGSCC**				
2,3,7,8-TCDD	NE	NE	NE	**17**	**59**	**47**	**23**
1,2,3,7,8-PeCDD	NE	NE	NE	**0.62 Q,T**	**2.0 Q,T**	**1.6 T**	**0.83 Q,T**
1,2,3,4,7,8-HxCDF	NE	NE	NE	**0.59 T**	**2.2 T**	**1.6 Q,T**	**0.68 Q,T**
1,2,3,6,7,8-HxCDD	NE	NE	NE	**3.5 T**	**11**	**6.9 Q**	**4.5 T**
1,2,3,7,8,9-HxCDD	NE	NE	NE	**2.1 T**	**5.4**	**4.4 T**	**2.4 T**
1,2,3,4,6,7,8-HpCDD	NE	NE	NE	**46**	**160**	**130**	**56**
OCDD	NE	NE	NE	**690 B**	**2,400 B**	**1,700 B**	**750 B**
2,3,7,8-TCDF	NE	NE	NE	**17 Q**	**7.7**	**5.6**	**3.0**
1,2,3,7,8-PeCDF	NE	NE	NE	**1.2 T**	**3.4 Q,T**	**3.2 T**	**0.98 Q,T**
2,3,4,7,8-PeCDF	NE	NE	NE	**3.1 T**	**8.3**	**7.8**	**3.7 T**
1,2,3,4,7,8-HxCDD	NE	NE	NE	**11 Q**	**33 Q**	**31 Q**	**14 Q**
1,2,3,6,7,8-HxCDF	NE	NE	NE	**2.6 T**	**9.5**	**6.5**	**4.0 T**
2,3,4,6,7,8-HxCDF	NE	NE	NE	**1.4 T**	**4.9 Q,T**	**3.8 T**	**1.7 Q,T**
1,2,3,7,8,9-HxCDF	NE	NE	NE	**0.44 T**	**0.51 Q,T**	**0.46 T**	5.0 U
1,2,3,4,6,7,8-HpCDF	NE	NE	NE	**36**	**120**	**110**	**45**
1,2,3,4,7,8,9-HpCDF	NE	NE	NE	**2.2 T**	**6.5**	**5.6**	**2.5 Q,T**
OCDF	NE	NE	NE	**220**	**160**	**150**	**54**
TEQ (calculated using 2005 WHO Factors)				**24**	**75**	**60**	**30**

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	Field Sample Identification			MSL09-040107-1045	MSL10-040107-1055	MSL11-040107-1055
				Sample Date 1/4/07	1/4/07	1/4/07
Analyte/Methods (Units)				Sample Time 10:45	10:55	10:55
General Soil Parameters	**New Jersey Standards**					
MCAWW 160.3M/ASTM D4464/ Lloyd Kahn/SW-846 9071B	**RDCSCC**	**NRDCSCC**	**IGSCC**			
Percent Solids (%)	NE	NE	NE	**77.4 %**	**78.1 %**	**80.4 %**
Grain Size Sand (%)	NE	NE	NE	**17.44 %**	**17.42 %**	**16.34 %**
Grain Size Silt (%)	NE	NE	NE	**60.06 %**	**59.93 %**	**60.36 %**
Grain Size Clay (%)	NE	NE	NE	**22.51 %**	**22.65 %**	**23.31 %**
Total Organic Carbon (mg/kg)	NE	NE	NE	**23,500**	**19,900**	**19,000**
Total Petroleum Hydrocarbons (mg/kg)	NE	NE	NE	**414**	**354**	**352**
Inorganics/Metals (mg/kg) **SW-846 6010B/7471A/7196A/9012A**	**RDCSCC**	**NRDCSCC**	**IGSCC**			
Silver	110	4,100	NE	**1.0**	**0.91**	**1.0**
Arsenic	20	20	NE	**7.4**	**8.1**	**7.1**
Barium	700	47,000	NE	**72.6**	**79.6**	**83.7**
Cadmium	39	100	NE	**0.92**	**0.83**	**0.99**
Chromium (total)	NE	NE	NE	**37.1 N**	**47.1 N**	**35.5 N**
Nickel	250	2,400	NE	**15.1**	**17.9**	**15.4**
Lead	400	600	NE	**85.1**	**77.1**	**79.1**
Selenium	63	3,100	NE	**0.41**	**0.46**	**0.44**
Zinc	1,500	1,500	NE	**128 E**	**130 E**	**127 E**
Mercury	14	270	NE	**1.5**	**1.5**	**1.5**
Cyanide, total	1100	21,000	NE	0.65 U	0.64 U	0.62 U

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	Field Sample Identification			MSL09-040107-1045	MSL10-040107-1055	MSL11-040107-1055
			Sample Date	1/4/07	1/4/07	1/4/07
Analyte/Methods (Units)			**Sample Time**	10:45	10:55	10:55
TCLP Metals (mg/L)						
SW-846 6010B/7471A/7196A/9012A	**RDCSCC**	**NRDCSCC**	**IGSCC**			
Silver	-	-	-	0.50 U	0.50 U	0.50 U
Arsenic	-	-	-	**0.21 T**	**0.23 T**	**0.24 T**
Barium	-	-	-	**0.15 T**	**0.19 T**	**0.17 T**
Cadmium	-	-	-	**0.015 T**	**0.0051 T**	**0.0030 T**
Chromium (total)	-	-	-	**0.0057 T**	**0.0052 T**	**0.0063 T**
Lead	-	-	-	**0.031 T**	**0.053 T**	**0.055 T**
Selenium	-	-	-	0.25 U	0.25 U	0.25 U
Mercury	-	-	-	0.00020 U	0.00020 U	**0.00007**

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Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL09-040107-1045	MSL10-040107-1055	MSL11-040107-1055
				Sample Date	1/4/07	1/4/07	1/4/07
				Sample Time	10:45	10:55	10:55
Organochlorine Pesticides (µg/kg) SW-846 8081A							
Chlordane (technical)	NE	NE	NE		55 U	54 U	53 U
alpha-BHC	NE	NE	NE		5.5 U	5.4 U	5.3 U
beta-BHC	NE	NE	NE		5.5 U	5.4 U	5.3 U
delta-BHC	NE	NE	NE		5.5 U	5.4 U	5.3 U
gamma-BHC (Lindane)	520	2,200	50,000		5.5 U	5.4 U	5.3 U
Heptachlor	150	650	50,000		5.5 U	5.4 U	5.3 U
Aldrin	40	170	50,000		5.5 U	5.4 U	5.3 U
Heptachlor epoxide	NE	NE	NE		**1.4 T, PG**	**1.1 T, PG**	**1.0 T, PG**
Endosulfan I	340,000[a]	6,200,000[b]	50,000[c]		5.5 U	5.4 U	5.3 U
Dieldrin	42	180	50,000		**1.6 T, PG**	5.4 U	5.3 U
4,4'-DDE	2,000	9,000	50,000		**26**	**37**	**25**
Endrin	17,000	310,000	50,000		**0.87 T, PG**	**1.2 T, PG**	**1.2 T, PG**
Endrin ketone	NE	NE	NE		5.5 U	5.4 U	5.3 U
Endrin aldehyde	NE	NE	NE		**7.3**	**6.1 PG**	**8.5**
Endosulfan II	340,000[a]	6,200,000[b]	50,000[c]		5.5 U	5.4 U	5.3 U
4,4'-DDD	3,000	12,000	50,000		**24 PG**	**35 PG**	**26 PG**
Endosulfan sulfate	340,000[a]	6,200,000[b]	50,000[c]		5.5 U	5.4 U	5.3 U
4,4'-DDT	2,000	9,000	500,000		**36**	**190**	**24**
Methoxychlor	280,000	5,200,000	50,000		**18**	**71**	**27**
alpha-Chlordane	NE	NE	NE		**8.3**	**3.2 T, PG**	**2.8 T, PG**
gamma-Chlordane	NE	NE	NE		**6.7**	**2.6 T, PG**	**2.3 T, PG**
Toxaphene	100	200	50,000		*7.3 U*	*7.2 U*	*7.0 U*

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Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL09-040107-1045	MSL10-040107-1055	MSL11-040107-1055
				Sample Date	1/4/07	1/4/07	1/4/07
				Sample Time	10:45	10:55	10:55
Semi-Volatile Organic Compounds (µg/kg)							
SW-846 8270C							
Acenaphthene	3,400,000	10,000,000	100,000		**66 T**	**61 T**	**61 T**
Acenaphthylene	NE	NE	NE		**260 T**	**150 T**	**170 T**
Anthracene	10,000,000	10,000,000	100,000		**220 T**	**130 T**	**150 T**
Benzo(a)anthracene	900	4,000	500,000		**610 T**	**360 T**	**400 T**
Benzo(b)fluoranthene	900	4,000	50,000		**550 T**	**290 T**	**360 T**
Benzo(k)fluoranthene	900	4,000	500,000		**250 T**	**140 T**	**160 T**
Benzo(ghi)perylene	NE	NE	NE		**350 T**	**150 T**	**200 T**
Benzo(a)pyrene	660	660	100,000		**600 T**	**300 T**	**370 T**
Chrysene	9,000	40,000	500,000		**810 T**	**450 T**	**520 T**
Dibenz(a,h)anthracene	660	660	100,000		35 U	35 U	34 U
1,4-Dichlorobenzene	570,000	10,000,000	100,000		**61 T**	2,100 U	2,100 U
2,4-Dinitrotoluene	1,000	4,000	10,000		*23 U*	*22 U*	*22 U*
Fluoranthene	2,300,000	10,000,000	100,000		**1,000 T**	**620 T**	**600 T**
Fluorene	2,300,000	10,000,000	10,000		**92 T**	**58 T**	**72 T**
Hexachlorobenzene	660	2,000	100,000		*43 U*	*43 U*	*42 U*
Hexachlorobutadiene	1,000	21,000	100,000		*42 U*	*42 U*	*41 U*
Hexachloroethane	6,000	100,000	100,000		2,100 U	2,100 U	2,100 U
Indeno(1,2,3-cd)pyrene	900	4,000	500,000		**300 T**	**150 T**	**180 T**
2-Methylphenol	2,800,000	10,000,000	NE		2,100 U	2,100 U	2,100 U
3 and 4-Methylphenol	2,800,000	10,000,000	NE		2,100 U	2,100 U	2,100 U
Naphthalene	230,000	4,200,000	100,000		**94 T**	**69 T**	**63 T**
Nitrobenzene	28,000	520,000	10,000		2,100 U	2,100 U	2,100 U
Pentachlorophenol	6,000	24,000	100,000		*3,000 U*	*2,900 U*	*2,800 U*
Pyrene	1,700,000	10,000,000	100,000		**860 T**	**460 T**	**570 T**
2,4,5-Trichlorophenol	5,600,000	10,000,000	50,000		2,100 U	2,100 U	2,100 U
2,4,6-Trichlorophenol	62,000	270,000	10,000		2,100 U	2,100 U	2,100 U

Rev 2

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	Sample Date / Sample Time	MSL09-040107-1045	MSL10-040107-1055	MSL11-040107-1055
						1/4/07 10:45	1/4/07 10:55	1/4/07 10:55
Polynuclear Aromatic Hydrocarbons µg/kg)								
Acenaphthene	3,400,000	10,000,000	100,000			**68 T**	**80 T**	**73 T**
Acenaphthylene	NE	NE	NE			**300**	**210**	**200**
Anthracene	10,000,000	10,000,000	100,000			**270**	**220**	**210**
Benzo(a)anthracene	900	4,000	500,000			**640**	**500**	**510**
Benzo(b)fluoranthene	900	4,000	50,000			**940**	**670**	**610**
Benzo(k)fluoranthene	900	4,000	500,000			**330**	**280**	**290**
Benzo(ghi)perylene	NE	NE	NE			**720**	**510**	**510**
Benzo(a)pyrene	660	660	100,000			**790**	**550**	**570**
Chrysene	9,000	40,000	500,000			**830**	**590**	**580**
Dibenzo(a,h)anthracene	660	660	100,000			**180**	**130**	**130**
Fluoranthene	2,300,000	10,000,000	100,000			**1,100**	**860**	**840**
Fluorene	2,300,000	10,000,000	100,000			**95**	**100**	**95**
Indeno (1,2,3-c,d)pyrene	900	4,000	500,000			**570**	**400**	**400**
Naphthalene	230,000	4,200,000	100,000			**92**	**81 T**	**71 T**
Phenanthrene	NE	NE	NE			**500**	**470**	**420**
Pyrene	1,700,000	10,000,000	100,000			**1,100**	**830**	**820**

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BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	MSL09-040107-1045	MSL10-040107-1055	MSL11-040107-1055
				Sample Date	1/4/07	1/4/07	1/4/07
				Sample Time	10:45	10:55	10:55
Polychlorinated Biphenyls (µg/kg)							
SW-846 8082 (Congeners)							
PCB 1 (BZ)	NE	NE	NE		**5.7 T, PG**	**10 T**	**8.5 T, PG**
PCB 5 (BZ)	NE	NE	NE		**1.1 PG**	**1.6 PG**	**1.7 PG**
PCB 18 (BZ)	NE	NE	NE		**7.8**	**8.7**	**9.2**
PCB 31 (BZ)	NE	NE	NE		**13**	**14**	**15**
PCB 52 (BZ)	NE	NE	NE		**11**	**11**	**12**
PCB 66 (BZ)	NE	NE	NE		**8.3**	**8.3**	**8.4**
PCB 87 (BZ)	NE	NE	NE		**2.9 PG**	**2.2 PG**	**2.3 PG**
PCB 101 (BZ)	NE	NE	NE		**9.7**	**8.7**	**9.5**
PCB 110 (BZ)	NE	NE	NE		**8.0 PG**	**6.4 PG**	**7.0 PG**
PCB 141 (BZ)	NE	NE	NE		**2.0**	**1.6**	**1.7**
PCB 151 (BZ)	NE	NE	NE		1.1 U	1.1 U	1.1 U
PCB 153 (BZ)	NE	NE	NE		**10 PG**	**6.1 PG**	**8.3**
PCB 170 (BZ)	NE	NE	NE		**3.7**	**3.0**	**3.1**
PCB 180 (BZ)	NE	NE	NE		**7.4**	**6.1**	**4.4 PG**
PCB 187 (BZ)	NE	NE	NE		**4.5**	**3.6**	**3.7**
PCB 206 (BZ)	NE	NE	NE		**1.7**	**1.0 T, PG**	**1.0 T, PG**
Total PCBs (calculated)	490	2,000	50,000		**96.8**	**92.3**	**95.8**

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TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

Analyte/Methods (Units)	RDCSCC	NRDCSCC	IGSCC	Field Sample Identification	Sample Date / Sample Time	MSL09-040107-1045 1/4/07 10:45	MSL10-040107-1055 1/4/07 10:55	MSL11-040107-1055 1/4/07 10:55
Dioxins and Furans (pg/g)								
SW-846 8280								
2,3,7,8-TCDD	NE	NE	NE			**36**	**55**	**20**
1,2,3,7,8-PeCDD	NE	NE	NE			**0.99 T**	**1.2 T**	**0.57 Q,T**
1,2,3,4,7,8-HxCDF	NE	NE	NE			**0.94 Q,T**	**1.0 T**	**0.49 Q,T**
1,2,3,6,7,8-HxCDD	NE	NE	NE			**5.9**	**6.8**	**3.1 Q,T**
1,2,3,7,8,9-HxCDD	NE	NE	NE			**2.9 T**	**3.6 T**	**1.8 T**
1,2,3,4,6,7,8-HpCDD	NE	NE	NE			**81**	**120**	**45**
OCDD	NE	NE	NE			**970 B**	**1,200 B**	**550 B**
2,3,7,8-TCDF	NE	NE	NE			**4.0**	**4.6**	**2.5**
1,2,3,7,8-PeCDF	NE	NE	NE			**1.8 Q,T**	**2.4 T**	**1.3 T**
2,3,4,7,8-PeCDF	NE	NE	NE			**5.3**	**6.3**	**3.1 T**
1,2,3,4,7,8-HxCDD	NE	NE	NE			**20**	**21**	**11**
1,2,3,6,7,8-HxCDF	NE	NE	NE			**6.1 Q,T**	**5.2**	**3.7 T**
2,3,4,6,7,8-HxCDF	NE	NE	NE			**2.2 T**	**3.7 T**	**1.2 Q,T**
1,2,3,7,8,9-HxCDF	NE	NE	NE			**1.1 T**	**0.35 T**	5.0 U
1,2,3,4,6,7,8-HpCDF	NE	NE	NE			**68**	**75**	**36**
1,2,3,4,7,8,9-HpCDF	NE	NE	NE			**2.2 Q,T**	**3.9 Q,T**	**1.5 Q,T**
OCDF	NE	NE	NE			**79**	**87**	**59**
TEQ (calculated using 2005 WHO Factors)						**45**	**65**	**25**

TABLE 2
LOWER PASSAIC RIVER DATA SUMMARY TABLE
BIOGENESIS SEDIMENT WASHING TECHNOLOGY DEMONSTRATION PROJECT
Stockpiled Material

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Notes

g	gram(s)
pg/g	picogram(s) per gram
µg/kg	microgram(s) per kilogram
mg/kg	milligram(s) per kilogram
NRDCSCC	Non-residential direct contact soil cleanup criteria
RDCSCC	Residential direct contact soil cleanup criteria
NON-RES	Non-residential
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
RES	Residential
SVOC	Semi-volatile organic compound
TEF	Toxicity Equivalency Factor
a	The sum of endosulfan I, endosulfan II, and endosulfan sulfate may not exceed 340,000 µg/kg.
b	The sum of endosulfan I, endosulfan II, and endosulfan sulfate may not exceed 6,200,000 µg/kg.
Bold	Bolded result indicates positively identified analyte.
Italics	Italicized result indicates the sample is reported to the method detection limit (MDL)
Shading	Shading indicates a result or reporting limit greater than the RDCSCC or NRDCSCC
--	Not scheduled
B	Analyte detected in associated blank
J	Data are estimated due to associated quality control data.
NE	Not established
NR	Not regulated in pathway
Q	Estimated maximum possible concentration (EMPC)
T	Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
U	Analyte not detected above the method detection limit.
UB	Analyte considered not detected based on associated blank data.
UJ	Potential low bias, possible false negative.

Gas Technology Institute
ENDESCO Clean Harbors, L.L.C.
TECHNICAL MEMORANDUM

ECH Project Numbers:	**H-40201-21, H-05850-02**
Report For:	**November 2006 - March 2007**
Report Type:	**Project Status Report**
Project Title:	**Cement-Lock® Technology for Decontaminating Dredged Estuarine Sediments: Phase II – Demonstration-Scale Project**
Project Manager:	**Michael C. Mensinger**
Project Duration:	**May 2003 to December 31, 2007**
Status:	**Active**
NJ-DOT/OMR Contract Number	**AO-9345380 (end date 12/31/06)**
BNL Contract Number	**725043 (end date 7/31/07)**
Proposal Numbers:	**ECH No. 101R1, 115, 116, 118, and 121R2, 122 GTI No. 10021.1.18 (18656-18R2), 10116.1.45R1, 10116.1.66R2**

This Technical Memorandum includes the following major sections:

1. Background
2. Project Objectives
3. Equipment Modifications
4. Confirmation Test with Stratus Petroleum Sediment
5. Extended Duration Test with Passaic River Sediment
6. Discussion of Analytical Results
7. Comparison of Air Emission Results with New Jersey Regulations
8. Implications for Commercial Operations
9. Economic Estimates for Cement-Lock Technology
10. Summary and Conclusions
11. Future Work

1. BACKGROUND

The Cement-Lock® Technology is a thermo-chemical remediation technology that converts contaminated sediment and other wastes into construction-grade cement – a marketable product for beneficial use. In the Cement-Lock process, a mixture of sediment and modifiers is charged to a rotary kiln melter (Ecomelt® Generator). The Ecomelt Generator is maintained at a temperature in the range of 2400° to 2600°F by combustion of natural gas or other fuels with air. This temperature yields a molten homogeneous mixture with a manageable viscosity and causes the minerals in the sediment and modifier mixture to react together.

All nonvolatile heavy metals originally present in the sediment are incorporated into the melt matrix via an ionic replacement mechanism. The melt flows slowly through the Ecomelt Generator like lava as the kiln rotates. The melt then falls by gravity through a plenum and into water, which immediately quenches and granulates the melt. The quenched and granulated

material – Ecomelt® – is removed from the quench granulator by a drag conveyor, which also partially dewaters it.

Flue gas from the Ecomelt Generator flows into a Secondary Combustion Chamber (SCC), which provides an additional 2 seconds of residence time at a minimum temperature of 2200°F to ensure complete destruction of any organic compounds that survive the severe thermal conditions in the Ecomelt Generator. Flue gas exiting the SCC is rapidly cooled via direct water injection to prevent the formation or recombination of dioxin or furan precursors. In a commercial application, thermal energy of the flue gas could be used to raise steam in a heat recovery steam generator.

Powdered lime (CaO) is injected into the cooled gas to capture acid gases [i.e., sulfur dioxide (SO_2) and hydrogen chloride (HCl)] and sodium and potassium chlorides from seawater. The sulfur/salt/spent lime mixture is removed from the flue gas stream by a baghouse. The spent lime from the baghouse is containerized and shipped to a landfill. In a commercial application, a portion of the spent lime may be recycled to the front of the plant for use as a modifier. Volatile heavy metals, such as mercury, are removed from the flue gas as it passes through a fixed bed of activated carbon pellets. Cleaned flue gas is vented to the atmosphere at about 350°F via an induced draft (I.D.) fan.

In the event that nitrogen oxide (NOx) emissions need to be controlled to meet local regulations, conventional NOx reduction techniques and equipment can be included in the overall process flow diagram.

The Cement-Lock Technology was developed by the Gas Technology Institute (GTI, Des Plaines, IL) and Unitel Technologies (Mount Prospect, IL). The intellectual property associated with Cement-Lock is covered by two U.S. patents and several foreign patents. The technology is licensed by Volcano Partners, L.L.C.

Cement-Lock Demonstration Plant: ENDESCO Clean Harbors, L.L.C. (ECH, a wholly owned subsidiary of GTI) installed the Cement-Lock demonstration plant on a 2-acre parcel of land at the International Matex Tank Terminal (IMTT) in Bayonne, NJ. The demo plant incorporates the major equipment components needed to demonstrate and characterize the process (Figure 1). The final steps in producing Cement-Lock construction-grade cement – grinding and blending the Ecomelt with Portland cement or another lime source – can be accomplished at an off-site facility. The demo plant has a nominal throughput capacity of 10,000 yd^3 of sediment per year. With process enhancements (sediment predrying, oxygen enrichment), its throughput can be increased to 30,000 yd^3/year.

2. PROJECT OBJECTIVES

The overall objectives of the Phase II – Demonstration-Scale Project are to modify the Cement-Lock demo plant so that it can operate in slagging mode, confirm the operation with Stratus Petroleum sediment, and process about 200 tons of sediment dredged from the Passaic River through the system. During processing, the sediment will be converted into Ecomelt®, a portion of which will be converted into construction-grade cement for a beneficial use demonstration.

The specific objectives of the Phase II demonstration-scale project are to:

- Complete the final design and implement equipment modifications and other necessary repairs to the Cement-Lock demo plant – specifically in the sediment and modifier feeding, the slag discharging, and the air pollution control systems.
- Secure an Environmental Improvement Pilot Test permit from the New Jersey Department of Environmental Protection (NJ-DEP) for the demonstration project.
- Conduct a Confirmation Test of up to 72 hours duration with the modified Cement-Lock demo plant to confirm that the modifications are effective using up to 100 yd^3 of Stratus Petroleum sediment remaining from the previous phase.
- Upon successful completion of the Confirmation Test and after obtaining approval from the sponsors, conduct an Extended Duration Test with the modified Cement-Lock demo plant to process about 200 tons of mechanically dewatered Passaic River sediment.
- Facilitate the environmental and air (stack) sampling task to be conducted by the EPA SITE (Superfund Innovative Technology Evaluation) Program.
- Conduct a beneficial use demonstration with Ecomelt produced from Passaic River sediment.
- Update the economics of the Cement-Lock Technology as warranted by the Phase II results.
- Arrange for the dismantlement of the Cement-Lock demo plant and restoration of the IMTT site per ECH's lease agreement.

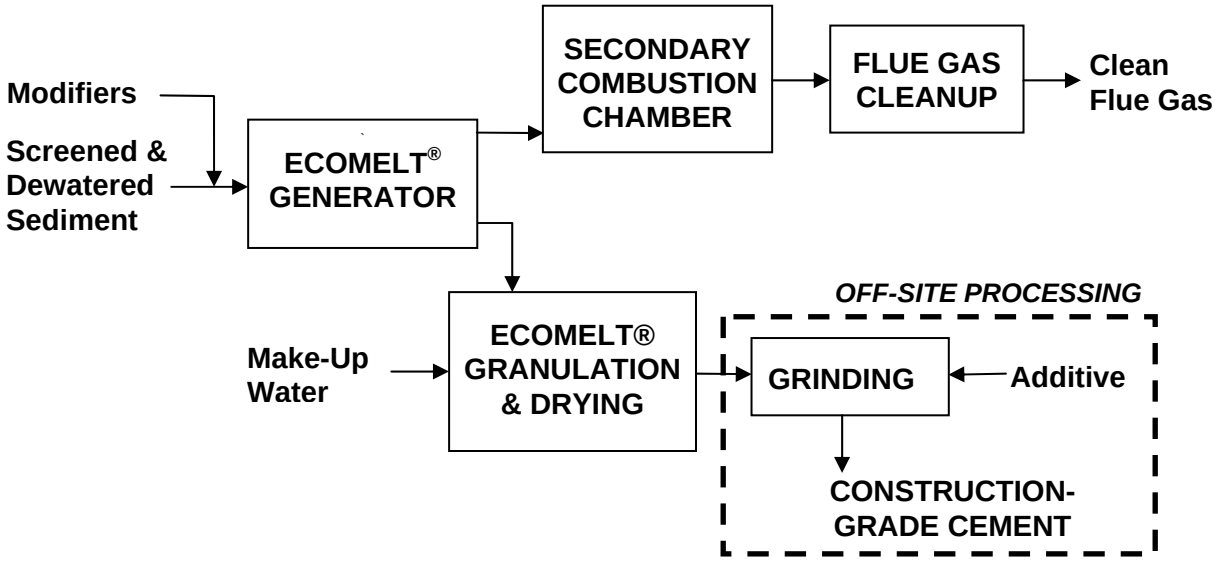

Figure 1. Process Flow Diagram for Cement-Lock Demonstration Plant

3. EQUIPMENT MODIFICATIONS

Major equipment modifications were implemented at the Cement-Lock demonstration plant to improve its performance in the critical areas of sediment/modifier feeding and mixing, and

molten slag discharging from the drop-out box. The design work for the equipment modifications was initiated in June 2006. Procurement, construction, and installation activities were completed at the plant site from July through November 2006. Equipment modification design, procurement, and installation were sponsored by the New Jersey Department of Transportation Office of Maritime Resources (NJ-DOT/OMR) under a contract with ECH. Other work performed to ready the equipment for the Confirmation Test with Stratus Petroleum sediment and the Extended Duration Test with Passaic River sediment is described below.

Refractory Installation: Duddy Contracting (Westfield, NJ) completed installation of the new refractory in the drop-out box and the kiln nose ring in November. Duddy used a process called "guniting" to install the refractory. The refractory material – Versagun 60 – used for the kiln nose ring and drop-out box was recommended by the manufacturer (Harbison-Walker Refractories, HWR) for the fairly short-duration planned for the Confirmation Test as well as the Extended Duration Test.

Refractory Dryout: The newly installed refractory needed to be carefully dried out to prevent cracking during subsequent operation. HWR specified a dryout schedule in which the refractory would be heated to specific temperatures and "soaked" at these temperatures for specific times depending upon the refractory thickness. In all, the refractory dryout was estimated to take about 67 hours and reach a maximum temperature of 1100°F.

The dryout of the refractory was conducted by Team Industrial Services (TEAM, Aston, PA) over the course of 4 days. The TEAM equipment included a 10-million Btu/hour natural gas burner, blower, insulation, thermocouples for sensing temperature, and data acquisition equipment. The lower part of the drop-out box was closed off from the ambient using insulating blanket (Figure 2). The burner was inserted into the access hatchway on the north side of the drop-out box and insulated as shown in Figure 3.

Belt Conveyor System: The sediment belt conveyor system includes a 140-foot length of conveyor running from the sediment storage area parallel to the rotary kiln at a shallow incline. Another 40-foot section of belt conveyor runs perpendicular from the end of the 140-foot conveyor and is inclined up to the charging deck above the pug mill. The 140-foot conveyor has a 24-inch wide belt. The 40-foot conveyor has an 18-inch wide belt. Both sections of conveyor are covered.

The conveyor parts were shipped to the plant site on November 13 and 15. The mechanical contractor connected the conveyor sections and lifted them up onto the stanchions. SM Electric Company connected power to the two conveyor motors and ran conduit and wire so that the long conveyor could be started/stopped at the inlet. The belt conveyor system is shown in Figure 4.

V-Ram Solids: The V-Ram solids feeder was installed on the charging deck and the necessary electric and hydraulic connections were made. The V-Ram service technician visited the plant on November 6 to conduct shakedown testing and operator training. Also, shakedown testing of the V-Ram feeder was completed by the service technician.

To keep the sediment-modifier mixture from flooding the V-Ram hopper, a mechanical slide gate was installation between the pug mill discharge and the V-Ram hopper. An end view of the V-Ram feeder and its hydraulic connections is shown in Figure 5.

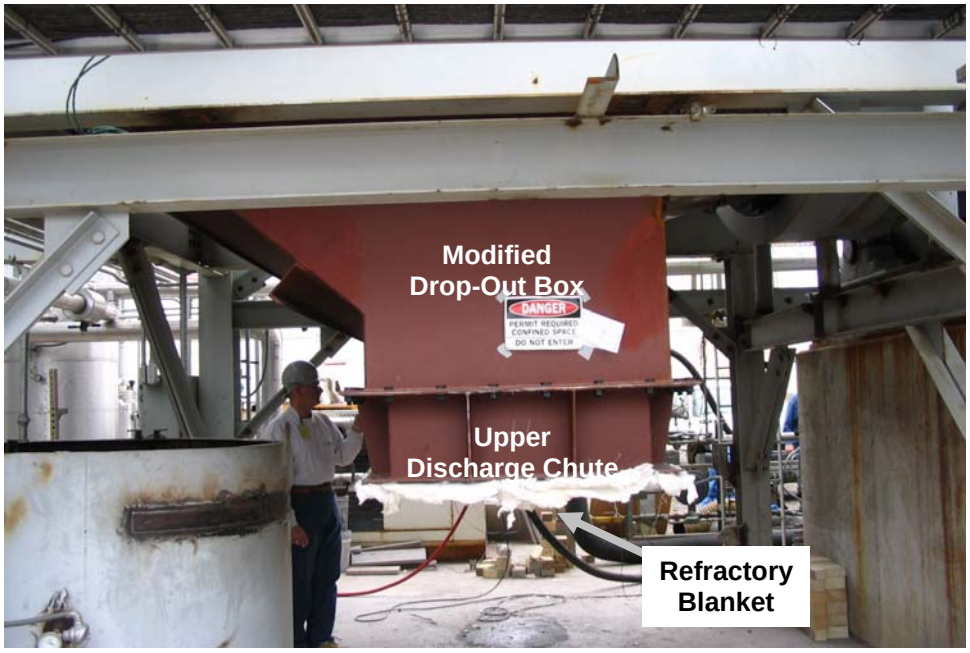

Figure 2. New Drop-Out Box and Upper Discharge Chute in Place with Refractory Blanket Shown at Bottom

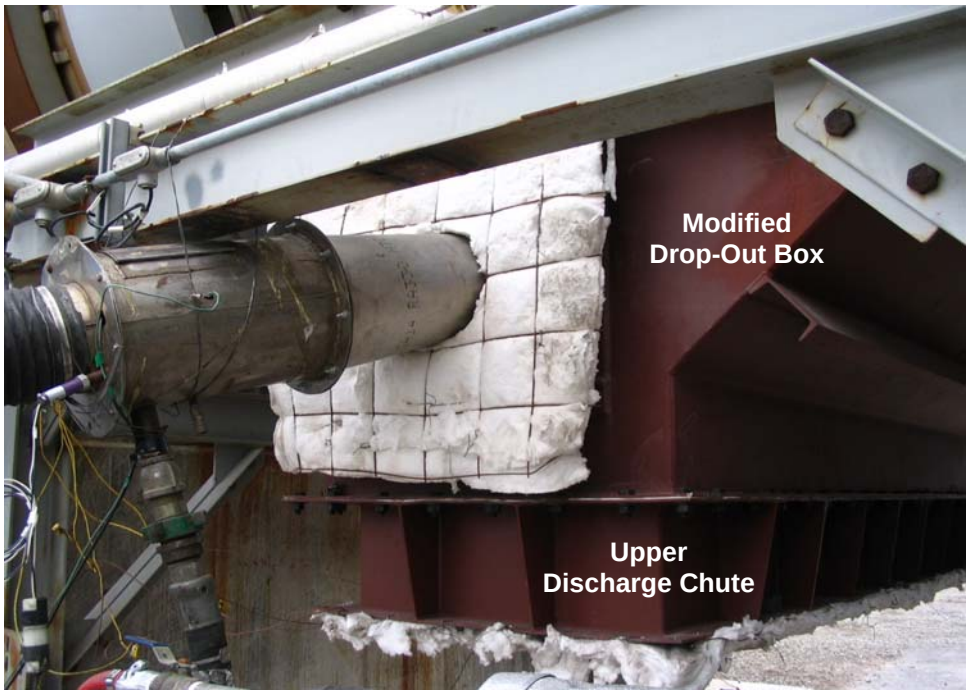

Figure 3. TEAM's 10-Million Btu/hour Burner Installed and Insulated in North Drop-Out Box Access Hatchway

Figure 4. Covered Belt Conveyors Running from the Sediment Storage Area to the Charging Deck (left: looking west from the sediment storage area; right: looking east from the SCC platform)

Figure 5. End-View of V-Ram and Hydraulic Connections

Scaffolding: Safety Scaffolds (Branchville, NJ) installed scaffolding at four locations: 1) the west end kiln view ports, 2) the north side drop-out box view port, 3) the activated carbon bed inlet, and 4) the main stack. Scaffolding for the west end kiln view ports and the north side drop-

out box view port were needed for proper operation of the plant. Scaffolding for the stack and activated carbon bed were required for the EPA SITE stack and environmental sampling teams.

4. CONFIRMATION TEST WITH STRATUS PETROLEUM SEDIMENT

In preparation for the Confirmation Test operations, a 10,000-lb capacity scale was ordered and delivered from Industrial Scales (Linden, NJ). The scale is capable of weighing a skid steer with and without a bucket-full of feedstock. Using the scale, the quantity of sediment/modifier mixture being fed to the conveyor belt system and thus to the rotary kiln system could be monitored.

The emergency generator (EmGen) was delivered by Foley Power Systems on November 13 (Monday). SM Electric connected the EmGen to the emergency grid by running appropriate cables from the EmGen to the MCC. The EmGen was tested for proper function.

Also, ECH rented a NOx meter from CleanAir Rentals (Palatine, IL) for monitoring NOx in the flue gas as required by the Environmental Improvement Pilot Test (EIPT) permit.

Chronological Discussion of Confirmation Test Operations: The demo plant equipment was started up and readied for operation on November 27 (Monday). Mr. Louis Ringger, Senior Project Manager, CEntry Constructors & Engineers, was on-site during the Confirmation Test as a consultant.

Initially, some difficulty was experienced in lighting the main burner. It would spontaneously shut down after reaching a temperature of about 450°-475°F. It was suggested that some connections in the main burner control panel had become corroded and needed cleaning. After the connections had been cleaned, the burner was restarted at about 9:30 a.m. November 28 (Tuesday). The system was heated at the prescribed rate to about 1800°F and held overnight.

The next day November 29 (Wednesday), the rotary kiln reached a temperature of 2400°F at about noon. Feeding the sediment-modifier mixture to the system was initiated via the skid steer bucket. The feed rate was one bucket of sediment-modifier mixture (about 1000 lb) per hour.

Prior to sediment feeding and at a kiln temperature of about 2200°F, slag was observed dripping on the west wall opposite the kiln nose. The source of this slag was apparently fly slag from the March 2005 non-slagging campaign that had accumulated in the SCC. The fly slag was melting and flowing to the drop-out box. As time progressed, this slag accumulation grew into a "pancake" (like a toadstool on a tree) about 1 foot in diameter and about 1 foot above the water level in the granulator.

About 2,000 pounds of sediment-modifier mixture were fed to the system and some chunks of slag material came out of the granulator. Some Ecomelt granules were also produced. However, the slag pancake on the west wall continued to grow in width and height and threatened the continuation of the test. It extended from the west wall eastward almost connecting with the east wall under the kiln becoming what is known as a “devil’s tongue.” In the north-south direction, it covered about 1/3 of the drop-out box opening. At about 4:15 p.m., the slag accretion detached itself from the west wall, dropped into the granulator and jammed the drag conveyor. Efforts to clear the jam were unsuccessful and the system had to be shut down.

At about 3:30 p.m., the cylinder packing around the V-Ram feeder piston was forced out of the cylindrical constrains and the V-Ram piston jammed. The V-Ram representative was immediately contacted to discuss options. V-Ram sent replacement packing and parts and said that it may be necessary to modify the ram to loosen up the equipment tolerances.

Overnight the kiln was cooled the kiln to 1800°F. The jam in the granulator was cleared by the night shift. In the morning (November 30, Thursday), the drag conveyor was operated in forward and reverse to get the chain moving. The broken chunks of slag were readily removed and the granulator was put back into operation at about 7:30 a.m.

Per V-Ram direction, measurements were taken of the main body of the ram and the two floating wedges. V-Ram said that the main body of the ram needed more clearance and that 0.1 inch needed to be removed from the top edge of the ram. The wedges also needed to be machined down about 1/32 inch. V-Ram also said that the grooves in the main body were not appropriate for our application and should be filled with weldment. As a result, the ram was removed from the piston and sent to a local machine shop for machining.

The temperature in the system was reduced to 1700°F and maintained overnight pending receipt of the machined parts.

The next morning, the kiln was heated to operating temperature of 2450°F. The V-Ram was reassembled with the machined ram and put back into operation. At about 2:00 pm, feeding the sediment-modifier to the system was initiated via 5-gallon pails to test the V-Ram, which operated well. The system was then from the skid steer bucket from the sediment storage area. The nominal feed rate was 2 buckets (about 2,000 lb) per hour of sediment-modifier mixture.

Sediment-modifier mixture was fed consistently all afternoon. Ecomelt was generated and two 1-yd^3 hoppers full of Ecomelt (Figure 6) and other slag material were deposited in a lined pile in the western part of the site.

In the meantime, another devil's tongue was forming on the west wall. As time progressed, the devil's tongue grew and covered much of the space between the kiln nose and the west wall. By about 6:00 p.m. feeding was halted to allow material in the kiln to exit to minimize the load on the granulator after the devil's tongue dropped off.

At 8:15 pm, the slag mass broke off the west wall and fell into the granulator. There was a sharp drop in kiln temperature and a spike in the system pressure due to the steam generated. As expected, the granulator drag chain jammed due to the slag chunk. Attempts to clear the jam were continued until about 12:00 midnight when it was decided that the system needed to be cooled to remove the slag. Cooling was initiated at that point at -100°F/hour.

By late Saturday afternoon, the kiln had cooled sufficiently so that the access hatchway on the north side of the drop-out box could be opened. The slag mass was irregularly shaped and about 2½ feet long, 1½ feet wide and 2 feet tall. It was resting on the upper drag conveyor slats. After a few impacts with a sledge, a few large chunks (½ to 1 foot in size) were fractured and removed from the mass. The slag was porous and relatively light in density.

Figure 6. Ecomelt (Stratus Petroleum sediment) Accumulating in the Skip Hopper

Confirmation Test Summary: Overall, the December 1 (Friday) test achieved much improved and consistent feeding via the V-Ram feeder and significant production of Ecomelt. A total of 5.1 tons of Stratus Petroleum sediment-modifier mixture was fed to the system.

5. EXTENDED DURATION TEST WITH PASSAIC RIVER SEDIMENT

NJ-DOT/OMR and EPA Region 2: Per agreement between NJ-DOT/OMR and EPA Region 2, the next test was to be conducted with Passaic River sediment instead of Stratus Petroleum sediment. The initial Passaic River sediment feed rate was planned to be 2,000 pounds per hour plus modifiers.

EPA SITE Program: Stack samplers (AirNova, Pennsauken, NJ), Tetra Tech EMI (Tetra Tech, Cincinnati, OH), and a representative from the EPA SITE Program arrived at the demo plant site on December 4 and began setting up their equipment including data acquisition trailer. AirNova had conducted stack sampling for Brookhaven National Laboratory during the GTI pilot test conducted with Newtown Creek sediment at Hazen Research (Golden, CO) in 1996.

To accommodate the 8 to 12 additional staff from AirNova, Tetra Tech, and the EPA SITE program, a second trailer was rented and delivered to the site. Sanitary tanks were also ordered and installed on the two trailers (instead of one portable toilet). Electric power was connected to the AirNova data acquisition trailer, the stack, and the activated carbon bed inlet locations.

For this test, the kiln operating temperature was reduced from 2475° to 2400°F to reduce the kiln flue gas velocity and minimize slag droplet carryover to the west wall. Reducing the temperature

will increase slag viscosity so the combined effects needed to be monitored closely. The excess air was also going to be reduced while maintaining permitted CO and O_2 levels.

Also in preparation for feeding the Passaic River sediment, both limestone and alumina feeders were recalibrated. The limestone feeder was calibrated successfully. The results of the alumina feeder calibration were inconsistent. While troubleshooting the alumina feeder, it was observed that the discharge chute from the hopper (T-104) had been installed backwards severely restricting flow. The necessary corrections were made, the feeder was reassembled, and the alumina feeder was successfully calibrated.

Chronological Discussion of the Extended Duration Test with Passaic River Sediment: On December 4 (Monday), after executing a confined space entry permit, operating personnel broke up the remaining slag mass and chipped excess slag from the kiln nose as well as the west and south walls. Very little slag was observed on the south wall.

After the system was sealed and readied for operation, some difficulty was again experienced igniting the primary burner. It was determined that one of the mechanical switches inside the Maxon switch was not making contact. This was rectified and the primary burner was ignited.

On Wednesday, Passaic River sediment and modifiers were fed at a rate of 1,400 pounds per hour beginning at about 8:20 a.m. (the sediment feed rate was 1,000 lb/hr; the modifier feed rate was 400 lb/hr). At 10:10 a.m., there was a brief power outage caused by the nose cooling blower that shut the plant down. The problem was rectified and by 11:45 a.m. the system was reheated to operating temperature (the kiln temperature had dropped during the power outage). At 1:00 p.m. the system was at the target temperature of 2400°F and feeding was resumed. During the test, the SCC temperature ranged from 2300° to 2350°F. By 3:30 p.m. enough Ecomelt had been generated to fill the skip hopper (1 yd^3). The skip hopper was transported to the western section of the plant site and the first batch of Ecomelt from Passaic River sediment was placed on a tarp.

The EPA SITE stack and environmental sampling teams took samples during the steady operating period.

During the rest of the day, a devil's tongue was observed forming on the west wall. At about 8:00 p.m. the devil's tongue fell off and jammed the granulator. By running the granulator forward and backward the jam was cleared thereby avoiding a plant shutdown. A photo of the devil's tongue discharged from the granulator is shown in Figure 7. It was about two feet long and about 1½ feet wide.

During Wednesday, a total of about 6 tons of Passaic River sediment was fed to the system. Limestone (Modifier 1) was fed to the pug mill for mixing with sediment at a rate of about 400 pounds per hour.

For the overnight shift, feeding was halted and the kiln temperature was maintained at 2400°F.

On Thursday (December 7), feeding of Passaic River sediment and modifiers was initiated at 7:40 a.m. at a rate of about 1,400 pounds per hour. The EPA SITE stack and environmental sampling teams took samples during the steady operating period.

Figure 7. Slag Chunk Cleared from Granulator and Discharged (December 6)

At one point, the kiln temperature was increased to 2550°F in an effort to dislodge an accretion of slag. Some large chunks of slag were cleared and discharged from the granulator, but the larger fraction of the slag remained. The temperature was then reduced to 2450°F.

During Thursday, about 7 tons of Passaic River sediment were fed to the system. As before, limestone (Modifier 1) was fed to the pug mill for mixing with sediment at a rate of about 400 pounds per hour. This was the most consistent sediment feeding episode to date.

For the overnight shift, feeding was again halted and the kiln temperature was maintained at 2400°F. At about 11:00 p.m. the primary burner experienced a flameout and the kiln temperature dropped to about 1300°F. At first, it was thought that the Maxon switch had again malfunctioned; however, troubleshooting the Maxon switch did not resolve the issue. Finally, after repeated attempts, the primary burner was ignited. The kiln temperature was reheated to the target temperature of 2400°F by about 7:00 a.m. (December 8).

Overnight, the ambient temperature fell to below freezing and by morning, sediment in the pug mill and the V-Ram feeder had frozen solid. It took until past noon to clear the frozen equipment. As a result, the EPA SITE stack and environmental sampling teams were not able to take samples in a timely manner and withdrew from the site.

Feeding sediment to the system was resumed at about 2:00 p.m. at a rate of about 1,000 pound per hour plus modifiers. During this session, however, slag was observed to begin sticking to the south wall. It was posited that slag already in the kiln had cooled sufficiently during the overnight flameout episode to stick to the south wall. A shelf built up on the west wall and from the south wall as shown in the photo (Figure 8). The two slag accumulations joined up during

the day and as more sediment was fed, the effective cross-sectional area of the drop-out box continued to diminish.

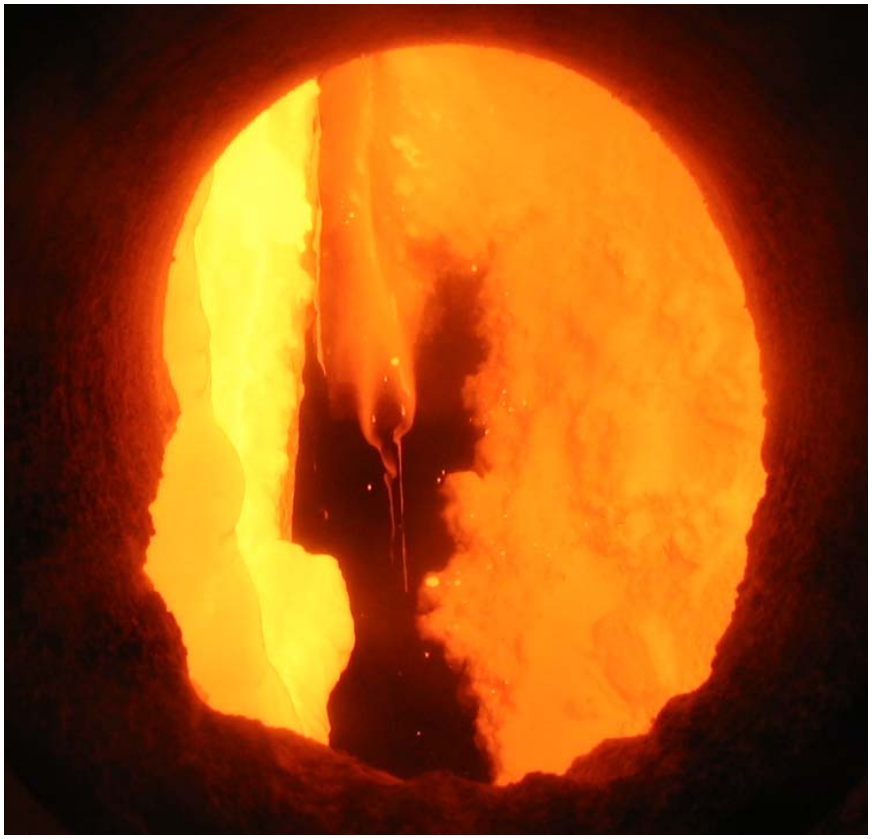

Figure 8. View from Above Drop-Out Box – Molten Slag Dripping from South Wall into the Granulator (kiln nose left, west wall right)

Fluorspar (CaF_2 – a fluxing agent) was added to the kiln in an attempt to make the slag more fluid to dislodge the blockage, but with no effect. At about 9:30 p.m. it was decided to shut the plant down. Later on Saturday (December 9) the kiln was cool enough to allow the access hatchway in the drop-out box to be opened. Looking south the photo (Figure 9) shows the well-formed devil's tongue almost in contact with the kiln nose. Note behind and below the devil's tongue is a massive black accretion of slag adhering to the south wall.

Summary: Significant milestones were achieved during the recent Cement-Lock demo plant campaigns. The equipment modifications implemented during the project extended the slagging mode operating time considerably. Sizable quantities of Ecomelt have been generated from both Stratus Petroleum as well as Passaic River sediment. The demo plant has been operated such that the EPA SITE program could conduct stack and environmental sampling – this time under slagging conditions.

Overall, the feed system performed quite well. The ALLU screening bucket performed as designed. The conveyor belts effectively conveyed the material from the sediment storage area to the pug mill on the charging deck. The mixer and V-Ram feeder also performed as designed (there was a learning curve associated with operating both of these units with sediment).

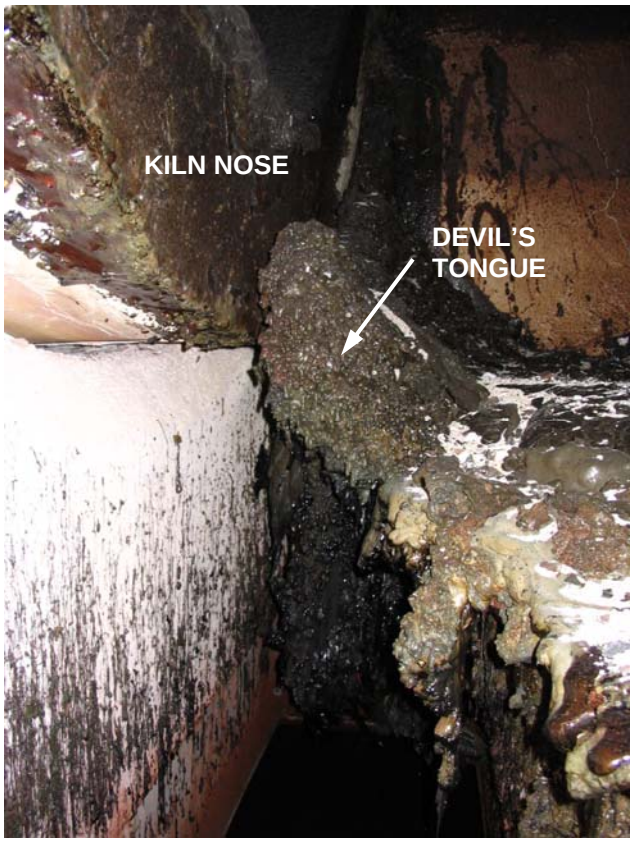

Figure 9. Devil's Tongue Extending from West Wall to Near the Kiln Nose

The modified demo plant has demonstrated the capability to process sediment at about ½ ton per hour in continuous operation. Slag accumulation in the drop-out box was significantly slowed, but not stopped. Best production achieved to date was 7 tons per day. Overall, about 5.1 tons of Stratus Petroleum sediment and about 16.5 tons of Passaic River sediment were processed.

6. DISCUSSION OF ANALYTICAL RESULTS

During the Cement-Lock demonstration campaign with Passaic River sediment, EPA SITE program and subcontractor personnel took stack and environmental samples for process characterization. Stack samples were taken by AirNova during two days of demo plant operation on December 6 and 7. Based on the results, AirNova prepared an Emission Evaluation Test Report (the draft is included in Appendix A; the final version will be forwarded upon receipt).

Samples of Passaic River sediment feed and Ecomelt product as well as other process samples were collected by Tetra Tech personnel. Analyses of these samples were conducted by Accutest Laboratories (Dayton, NJ), SGS Environmental Services (Wilmington, NC), and Element One (Wilmington, NC). The detailed chemical analyses of the feed and product samples for dioxins and furans, PCBs, metals, selected pesticides, and selected PAHs are included in Appendix B.

Leaching tests [Toxicity Characteristic Leaching Procedure (TCLP) and Synthetic Precipitation Leaching Procedure (SPLP)] were also conducted on samples of Ecomelt product and mortar

blocks prepared from blended cement from Ecomelt. The results of the leaching tests are also presented in Appendix B.

Tetra Tech EMI performed the data validation for EPA SITE.

As specified by the project Quality Assurance Project Plant, AirNova took samples of the flue gas in the duct upstream of the Activated Carbon Bed Adsorber and downstream in the stack. The flue gas in the stack was analyzed for SO_2, NOx, CO, and VOCs. The results are these analyses are presented in Table 1.

Table 1. Cement Lock Demonstration Site -- Carbon Bed Outlet:
SO_2, NO_x, CO, and VOCs Test Results Summary (AirNova Report)

Run No.	**1**	**2**	**3**	**Average**
Date	12/06/06	12/06/06	12/07/06	
Time Period	1625-1725	1812-1912	0934-1034	
Exhaust Gas Characteristics				
Oxygen (%-dry)	3.99	5.13	6.19	5.10
Carbon Dioxide (%-dry)	9.83	10.47	9.41	9.90
Temperature (°F)	287	286	304	292
Moisture (%)	51.1	54.4	53.1	52.9
Velocity (fps)	36.4	36.4	35.9	36.2
Flow Rate (ACFM)	14,983	15,002	14,795	14,927
Flow Rate (DSCFM)	5,230	4,898	4,830	4,986
Carbon Monoxide*				
Concentration (ppmVd)	> 100	17.3	4.2	> 40.5
Concentration (ppmVd	> 82.2	15.2	4.0	> 33.8
Emission Rate (lb/hr)	> 2.27	0.37	0.09	> 0.91
Volatile Organic Compounds				
Concentration (ppmVd)	4.7	4.6	0.9	3.4
Concentration (ppmVd	3.9	4.1	0.8	2.9
Emission Rate (lb/hr)	0.06	0.06	0.01	0.04
Nitrogen Oxides (as NO_2)				
Concentration (ppmVd)	94.0	134	149	126
Concentration (ppmVd	77.3	118	141	112
Emission Rate (lb/hr)	3.51	4.69	5.13	4.44
Sulfur Dioxide				
Concentration (ppmVd)	42.2	16.5	8.8	22.5
Concentration (ppmVd	34.7	14.5	8.3	19.2
Emission Rate (lb/hr)	2.19	0.80	0.42	1.14

Standard Conditions: 70°F, 29.92 inches Hg

* CO emissions during Run No. 1 were out of the calibration range of the analyzer which was operated in the 0-100 ppmV range. Therefore, CO emissions could not be quantified for this test run, and were reported as greater than the detectable quantity of 100 ppmV.

The results show that the level of CO in the flue gas during the first test exceeded the calibration limit of the analyzer. This indicates that the demo plant system was being operated at a less than

optimum condition regarding excess air. The oxygen concentration in the first test was 3.99%, which represents about 20% excess air for stoichiometric combustion of natural gas. This level of excess air was expected to provide sufficient oxygen to keep the CO levels low as achieved during the second and third tests. It is apparent from the results that the oxygen concentration in the flue gas should be maintained at about 5% for these process conditions.

The concentration of volatile organic compounds (VOCs) in the three tests was quite low, quite consistent, and averaged 0.04 lb/hour.

The emission of NOx in the flue gas averaged 4.44 lb/hour. This is higher than the 1.53 lb/hour measured during the non-slagging test conducted in March 2005. It should be noted that the current test was operated at a much higher temperature (2400°F compared with 1835°F) than the non-slagging test and that additional NOx formation was expected.

Depending upon the scale of commercial Cement-Lock Technology operations, NOx reduction equipment may need to be incorporated into the processing scheme to maintain NOx emissions within local regulatory limits (see Section 8 – Implications for Commercial Operations). The NOx emission was within the predicted rate for the overall system, which included the NOx contribution predicted for the emergency generator.

The emission of SO_2 averaged 1.14 lb/hour during the three tests. There was considerable variation in the three samples. The concentration in the first test was 42.2 ppm compared with 16.5 and 8.8 ppm during the second and third tests, respectively. The sulfur capture efficiency of the lime added to the bags in the baghouse appears to have increased somewhat during plant operation progressed. The emission limit was within the range allowed by the EIPT permit.

The results of tests to measure hydrogen chloride and chlorine are presented in Table 2.

Table 2. Cement Lock Demonstration Site Carbon Bed Outlet (Stack), HCl and Cl_2 Test Results Summary (AirNova Report)

Run No.	**1**	**2**	**Average**
Date	12/06/06	12/07/06	
Time Period	1700-1832	0959-1110	
Exhaust Gas Characteristics			
Oxygen (%-dry)	5.1	6.3	5.7
Carbon Dioxide (%-dry)	10.5	9.2	9.9
Temperature (°F)	286	307	297
Moisture (%)	54.3	52.6	53.5
Velocity (fps)	36.4	35.8	36.1
Flow Rate (ACFM)	15,001	14,761	14,881
Flow Rate (DSCFM)	4,901	4,843	4,872
Hydrogen Chloride			
Concentration (ppmV)	59.3	51.2	55.3
Emission Rate (lb/hr)	1.64	1.40	1.52

Standard Conditions: 70°F, 29.92 inches Hg

Note: Cl_2 emissions were determined to be non-detectable for both test runs. A detailed analysis of Cl_2 quantities can be found in Appendix C of the AirNova test report.

According to AirNova, Cl_2 was not detectable for both runs. The HCl emission rate averaged 1.52 lb/hour for the two tests. The results are within the permitted emission limits for HCl per the EIPT permit.

AirNova also took samples of flue gas upstream and downstream of the Activated Carbon Adsorber for priority metals. The complete results are included in the AirNova report. AirNova calculated the apparent collection efficiency of the Activated Carbon Bed Adsorber for these priority metal based on the inlet and outlet emission rates. The results are presented in Table 3 as the carbon bed capture efficiency. GTI added the specific results for mercury (Hg) and lead (Pb) to Table 3 to show collection efficiency of the Activated Carbon Bed Adsorber for these to metals.

Table 3. Cement Lock Demonstration Site – Carbon Bed Capture Efficiency for Toxic Metals, Mercury, and Lead – Test Results Summary (AirNova Report)

Run No.	Inlet (lb/hr)	Outlet (lb/hr)	Capture Efficiency (% wt)
1	1.6e-02	3.4e-03	78.8
2	4.5e-03	2.5e-03	44.4
		[Total Toxic Metals] Average	**61.6**
Separate Results for Mercury (added by GTI)			
1 (Hg)	3.0e-3	< 2.6e-05	99.1
2 (Hg)	2.3e-3	5.9e-4	74.3
		Average (Hg)	**86.7**
Separate Results for Lead (added by GTI)			
1 (Pb)	4.5e-4	4.3e-4	4.4
2 (Pb)	2.5e-4	2.0e-4	20.0
		Average (Pb)	**12.2**

$$\text{Capture Efficiency (\%)} = \frac{[\text{(lb/hr) Toxic Metal}_{in} - \text{(lb/hr) Toxic Metal}_{out}]}{\text{(lb/hr) Toxic Metal}_{in}} \times 100\%$$

AirNova also took samples of flue gas upstream and downstream of the Activated Carbon Bed Adsorber for dioxins and furans and PCBs. As above, the complete results are included in the AirNova report. AirNova calculated the collection efficiency of the Activated Carbon Bed Adsorber for dioxins and furans and PCBs based on the inlet and outlet emission rates. The results are presented in Table 4 as carbon bed capture efficiency.

GTI calculated the DREs (destruction and removal efficiency) for dioxins and furans as well as PCBs based on the mass flow rate of each of these contaminants in the feed material compared with the mass flow rate of these contaminants in the flue gas (Please note that as additional data becomes available the presence of these in other process streams will be quantified and reported). The results of these DRE calculations are presented in Table 5. The mass flow rates of contaminants in the flue gas are taken from the AirNova results.

Table 4. Cement Lock Demonstration Site – Carbon Bed Capture Efficiency for Dioxins and Furans and PCBs – Test Results Summary (AirNova Report)

Dioxins and Furans			
Run No.	**Inlet (lb/hr)**	**Outlet (lb/hr)**	**Capture Efficiency (% wt)**
1	7.7e-10	6.7e-11	91.3
2	6.7e-10	1.7e-13	99.9
Average (dioxins and furans)			**95.6**
PCBs			
1	1.9e-03	2.3e-04	87.9
2	1.4e-03	9.7e-05	93.1
Average (PCBs)			**90.5**

* The total emission rate (lb/hr) for the particular component from the entire demo plant including the emergency generator and the Ecomelt Generator.

$$\text{Capture Efficiency (\%)} = \frac{[\text{(lb/hr) D/F or PCBs}_{in} - \text{(lb/hr) D/F or PCBs}_{out}]}{\text{(lb/hr) D/F or PCBs}_{in}} \times 100\%$$

Table 5. DRE (GTI calculation) of Dioxins and Furans and PCBs from Cement-Lock Demo Plant Test with Passaic River Sediment

Dioxins and Furans (total of congeners*)			
Run No.	**Feed (lb/hr)**	**Outlet (lb/hr)**	**DRE (% wt)**
1	2.344e-5	6.7e-11	99.999714
2	2.344e-5	1.7e-13	99.99999927
Average (dioxins and furans)			**99.999856**
PCBs (total of congeners*)			
1	3.539e-03	2.3e-04	93.50
2	3.539e-03	9.7e-05	97.26
Average (PCBs)			**95.38**

*Non-detected congeners were included in the total assuming full detection limit

$$\text{DRE (\%)} = \frac{[\text{(lb/hr) D/F or PCBs}_{\text{feed in}} - \text{(lb/hr) D/F or PCBs}_{\text{flue gas out}}]}{\text{(lb/hr) D/F or PCBs}_{\text{feed in}}} \times 100\%$$

The treatment efficiency (TE) achieved by the Cement-Lock technology for Passaic River sediment is presented in Table 6. Treatment efficiency is the reduction in a particular contaminant, or class of contaminants, in the product (i.e., Ecomelt) compared with that particular contaminant, or class of contaminants, in the feed material.

Table 6. TE (GTI calculation) of Dioxins and Furans and PCBs from Ecomelt from Cement-Lock Demo Plant Test with Passaic River Sediment

Dioxins and Furans (total of congeners*)		
Feed (lb/hr)	**Ecomelt (lb/hr)**	**TE (% wt)**
2.344e-5*	1.0866e-8	99.953
PCBs (total of congeners*)		
3.539e-03	3.9700e-07	99.988

*Non-detected congeners were included in the total assuming full detection limit

$$TE\ (\%) = \frac{[(\text{lb/hr})\ D/F \text{ or } PCBs_{feed\ in} - (\text{lb/hr})\ D/F \text{ or } PCBs_{product\ out}]}{(\text{lb/hr})\ D/F \text{ or } PCBs_{feed\ in}} \times 100\%$$

Additional information on the destruction of semi-volatile organic contaminants (SVOCs) is contained in the AirNova Report. These results show very low or non-detected levels of contaminants of concern in the flue gas from the Cement-Lock demo plant campaign.

The results of compressive strength tests conducted on mortar samples using Ecomelt as a partial replacement for portland cement will be included in the project final report

7. COMPARISON OF AIR EMISSIONS WITH NEW JERSEY REGULATIONS

Table 7 summarizes the air emissions from the Cement-Lock demonstration plant during the campaign with Passaic River sediment in December 2006. The results are compared with the State of New Jersey Air Quality Regulations as promulgated in N.J.A.C. Title 7, Chapter 27, Subchapter 8.

The "NJ Reporting Threshold" is the emission rate that requires notification by the emitter to the NJ-DEP in the appropriate report. The "NJ SOTA Threshold" is the emission rate that can be achieved by the state-of-the-art pollution control technologies.

The "NJ Major Facility Threshold Level" means a facility that has the potential to emit any of the air contaminants in an amount which is equal to or exceeds the applicable major facility threshold level (N.J.A.C. 7:27-8).

The table shows that if the Cement-Lock demo plant were to be operated for a full year (8,760 hours per year) then NOx and HCl emissions would need to be controlled to a higher degree than achieved with the existing air pollution control equipment. NOx was generated at a level that puts the yearly emission into the major facility threshold category. From a process standpoint, there are several commercially available NOx reduction technologies, including some developed by GTI, which can achieve 90+ percent reduction in emissions. Emissions of HCl and SO_2 can be significantly reduced by improving the efficiency of dosing lime into the duct upstream of the bag house. Emission of CO can be reduced by increasing process excess air – an operating parameter. Overall, stringent air pollution control requirements for a commercial-scale Cement-Lock plant facility can be achieved through engineered solutions and best operating practices.

8. IMPLICATIONS FOR COMMERCIAL OPERATIONS

The results of the air emission tests presented above show that the extreme temperatures employed during Cement-Lock processing are very effective in destroying organic contaminants present in the Passaic River sediment. The results also show that the elevated temperatures necessary to destroy organic contaminants also form nitrogen oxides (NOx), which are precursors to acid rain and subject to environmental restrictions. Further, priority inorganic air pollutants, such as mercury and lead, must be carefully monitored and controlled. Operation of any sediment treatment facility must also demonstrate the ability to operate for extended periods without downtime. Issues of process availability are also discussed below.

Table 7. Comparison of Air Emissions from Cement-Lock Demo Plant Operation with Passaic River Sediment with New Jersey Regulations (N.J.A.C. 7:27-8)

	Cement-Lock Demo Plant		**NJ Reporting Threshold**	**NJ SOTA[1] Threshold**	**NJ Major Facility Threshold Level**
Air Contaminant	lb/hour	x 8760 hr	-------- Table A --------		
		ton/year	lb/hour	ton/year	Ton/year
Total VOC	0.04	0.175	0.05	5.0	25
TSP[2]	--[3]	--	0.05	5.0	100
PM-10	--	--	0.05	5.0	100
NOx	4.44	19.4	0.05	5.0	25
CO (excludes outlier)	0.23	1.01	0.05	5.0	100
SO_2 (excludes outlier)	0.61	2.67	0.05	5.0	100
Each HAP[4]	--	--	Table B	Table B	10
All HAPs Collectively	--	--	--	--	25
Any Other (ex. CO_2)	--	--	--	--	100
			-------- Table B --------		
		---------- lb/year ----------			
Cadmium (Cd)	1.4e-5	0.123	2	20	--
Cobalt (Co)	6.0e-6	0.053	20	200	--
Lead (Pb)	3.15e-4	2.76	2	20	10
Manganese (Mn)	9.2e-4	8.06	160	1,600	--
Mercury (Hg)	3.08e-4	2.70	2	20	--
Nickel (Ni)	1.3e-4	1.14	200	2,000	--
Selenium (Se)	1.9e-5	0.17	20	200	--
2,3,7,8-TCDD	ND[7]	ND	1.2e-4	1.2e-3	--
Dioxins/Furans	3.36e-11	2.9e-7	1.2e-4	1.2e-3	--
PCBs	1.64e-4	1.44	1.8	18	--
Hydrogen Chloride	1.52	13,300	2,000	10,000	--
Benzo(a)pyrene[6]	ND	ND	2	20	--
Naphthalene	4.6e-9	4.03e-5	2	20	--

1. SOTA = State-of-the-Art
2. TSP = Total Suspended Particulates
3. -- = Not analyzed
4. HAP = Hazardous Air Pollutant
5. Table B, N.J.A.C. 7:27-8, Appendix 1
6. Same threshold limits for polycyclic organic matter.
7. ND = Below analytical detection limit

The following is a discussion of the potential environmental effects of scaling-up from demo plant to commercial operation assuming that air emissions are proportional to the Passaic River sediment feed rate. The emissions of NOx, mercury, and lead as well as other contaminants of concern are regulated by the State of New Jersey Department of Environmental Protection, which has specified threshold, SOTA, and major facility levels as presented in Table 7. These limits were used in the following discussion.

NOx Emissions: If the average measured NOx emission rate from the Cement-Lock demo plant operation is scaled up to the yearly total (multiplying by 8,760 hours/year), the result – 19.4 ton/year – approaches the Major Facility Threshold Limit of 25 tons per year. As mentioned

above, the Cement-Lock demo plant does not have any NOx reduction equipment installed. However, if it is assumed that commercially available technologies can reduce NOx emissions by 90% and 95%, respectively, then the proportional treatment capacity of a commercial Cement-Lock plant can be 68,800 yd^3/year and 137,600 yd^3/year. Achieving a NOx emission reduction of 99% would permit a treatment capacity of 688,200 yd^3/year.

Hg Emissions: Following the same logic for mercury, if the average measured Hg emission rate (< 3.1e-4 lb/hr) from the Cement-Lock demo plant operation is scaled up to the yearly total, the result – 2.7 lb/year – is above the Reporting Threshold of 2 lb/year, but below the SOTA Threshold of 20 lb/year. Based on the average Hg emission rate and the SOTA Threshold value, the proportional commercial-scale Cement-Lock plant would have a treatment capacity of 39,400 yd^3/year. On the other hand, assuming the Hg emission rate from Run #1 (< 2.6e-5 lb/hr) and the SOTA Threshold value, the proportional commercial-scale Cement-Lock plant would have a treatment capacity of 470,100 yd^3/year. Assuming the Hg emission rate from Run #2 (5.9e-4 lb/hr), the proportional commercial-scale Cement-Lock plant would have a treatment capacity of 20,700 yd^3/year.

Pb Emissions: If the average measured lead emission rate (3.2e-4 lb/hr) from the Cement-Lock demo plant operation is scaled up to the yearly total, the result – 2.76 lb/year – is above the Reporting Threshold of 2 lb/year, but below the SOTA Threshold of 20 lb/year. Based on the average Pb emission rate and the SOTA Threshold value, the proportional commercial-scale Cement-Lock plant would have a treatment capacity of 38,200 yd^3/year. Assuming the Pb emission rate from Run #1 (4.3e-4 lb/hr) and the SOTA Threshold value, the proportional commercial-scale Cement-Lock plant would have a treatment capacity of 28,400 yd^3/year. Assuming the Pb emission rate from Run #2 (2.0e-4 lb/hr), the proportional commercial-scale Cement-Lock plant would have a treatment capacity of 61,100 yd^3/year.

Clearly, the emissions of mercury and lead from large-scale commercial Cement-Lock treatment facilities must be strictly controlled. The technology must be able to operate at a treatment capacity that enables it to achieve economies of scale without countervailing the environmental benefits of sediment remediation.

Sustainable Operations: As described in Sections 3, 4, and 5 above, the Cement-Lock demo plant has undergone considerable equipment modifications and changes. The objectives of these modifications and changes were to improve plant performance and extend operating time in slagging mode. Although considerable improvement has been achieved, the plant was operated for a maximum of 12 hours continuously during the December 2006 campaign. Further, the plant demonstrated resiliency in its ability to recover from large slag accumulations that dropped into the granulator and were discharged. Prior to the equipment modifications, the drop-out box would have plugged leading to an involuntary shutdown.

During the non-slagging demonstration project conducted in March 2005, the Cement-Lock demonstration plant achieved 17 days of continuous elevated temperature operation. The Ecomelt Generator (rotary kiln) and secondary combustion chamber temperatures were maintained at 1835° and 2115°F, respectively. The nominal feed rate of sediment-modifier mixture was 1,000 lb/hour. It should be noted that overnight ambient temperatures during the

March 2005 campaign dipped into the mid to low 20's. Considerable time was spent by operators and laborers to keep some equipment items from freezing up.

Although the equipment was operated at elevated temperature continuously during the campaign, sediment was not fed continuously, but primarily during the day and afternoon shifts. Thermally treated sediment was readily discharged from the drop-out box of the demo plant. The residence time of the sediment-modifier mixture in the rotary kiln averaged 70 to 80 minutes. The March 2005 non-slagging campaign demonstrated that the equipment could be operated in a sustained mode even under inclement weather conditions.

9. ECONOMIC ESTIMATES FOR CEMENT-LOCK TECHNOLOGY

At the request of Malcolm Pirnie Inc. (MPI), GTI prepared several project-based break-even cost estimates for different quantities of Passaic River sediment to be processed through different capacity Cement-Lock plants over different project periods. The quantities of sediment and project periods were from MPI's list of Alternative Case Numbers, specifically, Alternative Case Numbers 1, 2, 3, 8, 9, 11, 12a, and 13a (Per MPI, the Alternative Cases have been since revised).

For these estimates, GTI matched the quantity of sediment to be processed with either the demonstration-scale plant operating with oxygen enrichment (30,000 yd^3/year capacity), a 125,000 yd^3/year capacity plant (1 module), or a 250,000 yd^3/year capacity plant (2 modules).

For comparison purposes, MPI imposed the following assumptions on the cost estimates:

1. That only Passaic sediment be treated – No co-processing of other waste feedstocks
2. That the life of the plant = life of the project – No long-term amortization/capital recovery
3. Break out cost of beneficial use products
4. Provide costs with and without electric power co-generation

The cost estimates were scaled from ENDESCO Clean Harbor's N^{th} plant scenario as presented in the NJ-DOT/OMR Phase I Final Report (2006). The N^{th} plant scenario was for a 500,000 yd^3/year sediment treatment plant operating for an extended period of time with costs amortized over a 20-year period. The cost of natural gas was assumed to be $9.00/million Btu. Oxygen costs were escalated from a previous estimate for the Cement-Lock demo plant. Where applicable, the capital recovery costs were based on 75% debt and 25% equity. The cost of borrowing money was 6.75%. Operating costs were prorated based on the quantity of dredged sediment processed per year compared with the overall plant capacity.

In the cases in which power is generated for export, the electricity cost/price is $100/MW-hr. In the cases in which no power is generated, capital costs for power generation equipment were eliminated. The cost of beneficial use product, specifically pulverized Ecomelt, was assumed at $80/ton.

Table 8 presents the break-even tipping fees required for Cement-Lock processing of different quantities of Passaic River sediment over different project periods as specified in the MPI Alternatives. Where indicated, "P" indicates the break-even tipping fee with co-generation of

electric power; "NP" indicates the break-even tipping fee with no co-generation of electric power.

It should be noted that co-processing of different wastes and utilizing different energy sources for propelling the Cement-Lock technology can significantly enhance the overall economics of the Cement-Lock technology as presented.

Further, as a thermal treatment process, the Cement-Lock technology can achieve destruction and removal efficiencies (DREs) of 99.99% and higher depending upon the principal hazardous organic constituent (PHOC) selected and its original concentration in the sediment.

Table 8. Summary of Break-Even Tipping Fees Required for Cement-Lock Processing of Passaic River Sediment per MPI Alternative Numbers

MPI Alternative Number	Volume of dewatered sediment, yd^3	Project Duration, years	Processing, yd^3/year	Cement-Lock ---- Plant Capacity, yd^3/year ---- 30,000 Demo/w O_2	125,000 1 module	250,000 2 modules
				- Break-Even Tipping Fee, $/$yd^3$ -		
1 P / 1 NP	383,000	5	76,600		$152 / $155	
2 P / 2 NP	707,000	4	176,750			$134 / $136
3 P / 3 NP	1,067,000	7.5	142,267			$88 / $96
8 NP	84,500	3	28,167	$223		
9 NP	52,000	3.5	14,857	$265		
11 P / 11 NP	317,500	4.5	70,556		$178 / $179	
12a P / 12a NP	731,500	5.5	133,000			$125 / $128
13a NP	104,000	7	14,857	$215		

* P = Power Generation; NP = No power generation

10. SUMMARY AND CONCLUSIONS

The Cement-Lock demonstration-scale plant was operated in December 2006 with the overall objective of thermally treating sediment dredged from the Passaic River through the system and producing a beneficial use product. Although some equipment and weather-related problems were encountered during the campaign, the operating team successfully treated some 16.5 tons of Passaic River plus appropriate modifiers through the demo plant under steady conditions. Based on the results, it is estimated that some 15.6 tons of Ecomelt was produced. The EPA SITE program was able to conduct environmental and stack sampling during two operating days.

A considerable amount of analytical work has been completed to date on the samples taken during the December campaign. Not all of the analytical results and data have been validated. However, the results show that the Cement-Lock technology – when operated under slagging

mode – can achieve high destruction and removal efficiencies for contaminants of concern, specifically dioxins and furans and PCBs. Similarly, the Activated Carbon Bed Adsorber, the purpose of which is to capture volatile heavy metals (e.g., mercury), also successfully captured 86.7% of the mercury entering it.

The results showed that the levels of NOx produced during slagging-mode operation may require the addition of NOx reduction equipment to the overall Cement-Lock commercial plant process scheme to achieve local regulatory limits. Best management practices will be followed to enable selection of appropriate catalytic or non-catalytic NOx reduction equipment for the application.

11. FUTURE WORK

Because GTI had been operating the demo plant "at risk" to process the Passaic River sediment and the NJ-DOT/OMR contract funding had been essentially expended during the equipment modification work, GTI halted activities at the site pending receipt of contract. To minimize costs incurred, GTI had all rented equipment dismantled and returned.

During further discussions with sponsors, a roadmap was established for GTI to conduct another test campaign during which time additional Passaic River sediment would be processed through the Cement-Lock demo plant. During the planned test campaign, the plant would be operated for a period of from 5 to 7 days. The preblended sediment-modifier mixture would be fed during two shifts and flame management techniques would be employed during the third shift to address any slag accumulation issues. Also during the third shift, sediment and modifiers would be preblended in the sediment storage area. It is anticipated that the EPA SITE program will again participate in the program to provide analytical support for the environmental characterization of the process. The expected time this test campaign to be initiated is mid May 2007.

April 12, 2007

Respectfully submitted,

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This TECHNICAL MEMORANDUM was issued with the notice that the results included herein are subject to final confirmation and review.

APPENDIX A.

DRAFT

FINAL REPORT BY AIRNOVA, INC., PENNSAUKEN, NEW JERSEY

Project No. 2982

Tetra Tech EM, Inc. @ The Phase II Cement Lock Technology
Demonstration on Passaic River Sediments
Fabric Filter Baghouse Outlet and
Activated Carbon Bed Outlet
Bayonne, New Jersey

Emission Evaluation Test Report

Prepared for:

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Issued: February 2007

Table of Contents

1.0 Introduction

AirNova, Inc. conducted an emission evaluation test program on December 6-7, 2006 at the Cement Lock Technology Demonstration Site located in Bayonne, New Jersey. Emission sampling was conducted at the Fabric Filter Baghouse Outlet (also identified as the Granular Activated Carbon Bed Inlet) and the Granular Activated Carbon Bed Outlet to evaluate air emissions associated with the Cement Lock process for the following emission parameters:

- Nitrogen Oxides (NO_X)*
- Carbon Monoxide (CO)*
- Volatile Organic Compounds (VOCs)*
- Sulfur Dioxide (SO_2)*
- Dioxins and Furans
- Toxic Metals
- Polychlorinated Biphenyls (PCBs)
- Hydrogen Chloride (HCl) and Chlorine (Cl_2)*
- Polycyclic Aromatic Hydrocarbons (PAHs) or Semivolatile Organic Compounds (SVOCs)

* These emissions were determined at the Carbon Bed Outlet only.

Emission sampling was also conducted to determine the destruction and removal efficiency (DRE) for the above emission parameters that were conducted at both the Carbon Bed Inlet and Carbon Bed Outlet.

AirNova, Inc. was responsible for the performance of the on-site sampling and sample analysis as well as preparation of this final test report presenting the test results and discussions of all sampling and analytical methods utilized.

This report contains a description of the emission sources, the test locations, and the test methodologies that were utilized in the performance of this program. Questions or comments concerning this report may be directed to:

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2.0 Source Description

The Cement Lock Technology at the Cement Lock Demonstration Site was developed by Gas Technology Institute (GTI) and is licensed by Endesco Clean Harbors (ECH). The technology is a thermo-chemical environmental remediation process that generates construction-grade cement components as a by-product. A generalized schematic of the Cement Lock process is provided in Figure 2-1 on page 5. According to GTI/ECH, feed stock for the manufacturing process can be hazardous or nonhazardous wastes such as dredged sediments, soils, sludges, municipal solid wastes, debris from Brownfields projects, chemical wastes, and incinerator ash and residues. The manufacturing process creates a calcium-alumino-silicate glass termed Ecomelt, which is expected to have characteristics suitable for incorporation into cement. The process of creating Ecomelt is claimed to destroy organic contaminants and to immobilize inorganic contaminants within the Ecomelt.

2.1 Sampling Port Locations

Emission sampling was conducted at the Granular Activated Carbon Bed Inlet in a round, vertical section of exhaust duct which has an outer diameter (O.D.) of 42 inches and an inner diameter (I.D.) of 36 inches. Two (2) sampling ports located 2.3 duct diameters downstream and 0.8 duct diameters upstream from the nearest flow disturbances were utilized for all emissions sampling. A total of twenty-four (24) traverse points were utilized for all volumetric flow rate determinations and isokinetic sampling. The traverse points were located as follows:

Table 2-1
Cement Lock Demonstration Site
Granular Activated Carbon Bed Inlet
Emission Evaluation Test Program
Traverse Point Locations

Traverse Point	% Stack Diameter	Location (Inches)
1	2.1	0.8
2	6.7	2.4
3	11.8	4.2
4	17.7	6.4
5	25.0	9.0
6	35.6	12.8
7	64.4	23.2
8	75.0	27.0
9	82.3	29.6
10	88.2	31.8
11	93.3	33.6
12	97.9	35.2

Emission sampling was conducted at the Granular Activated Carbon Bed Outlet in a round, vertical section of exhaust duct which is 35.5 inches in diameter. Two (2) sampling ports located 6.3 duct diameters downstream and 3.5 duct diameters upstream from the nearest flow disturbances

were utilized for all emissions sampling. A total of sixteen (16) traverse points were utilized for all volumetric flow rate determinations and isokinetic sampling. The traverse points were located as follows:

Table 2-2
Cement Lock Demonstration Site
Granular Activated Carbon Bed Outlet
Emission Evaluation Test Program
Traverse Point Locations

Traverse Point	% Stack Diameter	Location (Inches)
1	3.2	1.1
2	10.5	3.7
3	19.4	6.9
4	32.3	11.5
5	67.7	24.0
6	80.6	28.6
7	89.5	31.8
8	96.8	34.4

Figure 2-1
Cement Lock Demonstration Site
Cement Lock Technology
Generalized Process Flow Diagram

3.0 Summary of Test Results

A complete summary of the test results conducted at the Cement Lock Demonstration Site at the Granular Activated Carbon Bed Inlet and the Granular Activated Carbon Bed Outlet is provided in tabular format. Emission sampling was conducted on December 6-7, 2006 to evaluate air emissions associated with the Cement Lock process. The list of tables which follows indicates the order in which the summary tables have been provided.

Cement Lock Demonstration Site
Emission Evaluation Test Program
Summary of Test Results Tables

Table 3-1
Cement Lock Demonstration Site
Carbon Bed Outlet
SO_2, NO_x, CO, and VOCs
Test Results Summary

Run No.	1	2	3	Average
Date	12/06/06	12/06/06	12/07/06	
Time Period	1625-1725	1812-1912	0934-1034	
Exhaust Gas Characteristics				
Oxygen (%-dry)	3.99	5.13	6.19	5.10
Carbon Dioxide (%-dry)	9.83	10.47	9.41	9.90
Temperature (° F)	287	286	304	292
Moisture (%)	51.1	54.4	53.1	52.9
Velocity (fps)	36.4	36.4	35.9	36.2
Flow Rate (ACFM)	14,983	15,002	14,795	14,927
Flow Rate (DSCFM)	5,230	4,898	4,830	4,986
Carbon Monoxide*				
Concentration (ppmVd)	> 100	17.3	4.2	> 40.5
Concentration (ppmVd @ 7% O_2)	> 82.2	15.2	4.0	> 33.8
Emission Rate (lb/hr)	> 2.27	0.37	0.09	> 0.91
Volatile Organic Compounds				
Concentration (ppmVd)	4.7	4.6	0.9	3.4
Concentration (ppmVd @ 7% O_2)	3.9	4.1	0.8	2.9
Emission Rate (lb/hr)	0.06	0.06	0.01	0.04
Nitrogen Oxides (as NO_2)				
Concentration (ppmVd)	94.0	134	149	126
Concentration (ppmVd @ 7% O_2)	77.3	118	141	112
Emission Rate (lb/hr)	3.51	4.69	5.13	4.44
Sulfur Dioxide				
Concentration (ppmVd)	42.2	16.5	8.8	22.5
Concentration (ppmVd @ 7% O_2)	34.7	14.5	8.3	19.2
Emission Rate (lb/hr)	2.19	0.80	0.42	1.14

Standard Conditions: 70°F, 29.92 inches Hg

* CO emissions during Run No. 1 were out of the calibration range of the analyzer which was operated in the 0-100 ppmV range. Therefore, CO emissions could not be quantified for this test run, and were reported as greater than the detectable quantity of 100 ppmV.

Table 3-2
Cement Lock Demonstration Site
Carbon Bed Outlet
HCl and Cl_2
Test Results Summary

Run No.	**1**	**2**	**Average**
Date	12/06/06	12/07/06	
Time Period	1700-1832	0959-1110	
Exhaust Gas Characteristics			
Oxygen (%-dry)	5.1	6.3	5.7
Carbon Dioxide (%-dry)	10.5	9.2	9.9
Temperature (° F)	286	307	297
Moisture (%)	54.3	52.6	53.5
Velocity (fps)	36.4	35.8	36.1
Flow Rate (ACFM)	15,001	14,761	14,881
Flow Rate (DSCFM)	4,901	4,843	4,872
Hydrogen Chloride			
Concentration (ppmV)	59.3	51.2	55.3
Emission Rate (lb/hr)	1.64	1.40	1.52

Standard Conditions: 70°F, 29.92 inches Hg

Note: Cl_2 emissions were determined to be non-detectable for both test runs. A detailed analysis of Cl_2 quantities can be found in Appendix C of this test report.

Table 3-3
Cement Lock Demonstration Site
Carbon Bed Inlet
Toxic Metals
Test Results Summary

Run No.	**1**	**2**	**Average**
Date	12/06/06	12/07/06	
Test Period	1625-1901	0930-1148	
Stack Gas Characteristics			
Oxygen (%-dry)	3.99	6.19	5.09
Carbon Dioxide (%-dry)	9.83	9.41	9.62
Temperature (° F)	337	341	339
Moisture (%)	52.8	54.6	53.7
Velocity (fps)	38.7	37.2	38.0
Flow Rate (ACFM)	16,421	15,784	16,103
Flow Rate (DSCFM)	5,101	4,672	4,887
Toxic Metals (Emission Rate - lb/hr)			
Arsenic	8.0e-05	2.0e-05	5.0e-05
Barium	5.1e-05	4.2e-05	4.7e-05
Cadmium	4.0e-05	3.1e-05	3.6e-05
Chromium	4.0e-04	3.7e-04	3.9e-04
Cobalt	1.4e-05	5.5e-06	9.8e-06
Copper	1.9e-04	1.1e-04	1.5e-04
Lead	4.5e-04	2.5e-04	3.5e-04
Manganese	9.8e-03	2.7e-04	5.0e-03
Nickel	3.4e-04	2.9e-04	3.2e-04
Selenium	1.1e-04	2.3e-05	6.7e-05
Silver	2.4e-05	1.5e-05	2.0e-05
Zinc	1.3e-03	7.9e-04	1.0e-03
Mercury	3.0e-03	2.3e-03	2.7e-03
Total Toxic Metals	**1.6e-02**	**4.5e-03**	**1.0e-02**

Standard Conditions: 70°F, 29.92 inches Hg

Table 3-4
Cement Lock Demonstration Site
Carbon Bed Outlet
Toxic Metals
Test Results Summary

Run No.	**1**	**2**	**Average**
Date	12/06/06	12/07/06	
Test Period	1625-1915	0930-1148	
Stack Gas Characteristics			
Oxygen (%-dry)	3.99	6.19	5.09
Carbon Dioxide (%-dry)	9.83	9.41	9.62
Temperature (° F)	287	304	296
Moisture (%)	51.1	53.1	52.1
Velocity (fps)	36.4	35.9	36.2
Flow Rate (ACFM)	14,983	14,795	14,889
Flow Rate (DSCFM)	5,230	4,830	5,030
Toxic Metals (Emission Rate - lb/hr)			
Arsenic	3.5e-05	4.6e-05	4.1e-05
Barium	4.5e-05	3.5e-05	4.0e-05
Cadmium	1.6e-05	1.1e-05	1.4e-05
Chromium	6.4e-04	2.6e-04	4.5e-04
Cobalt	5.9e-06	6.1e-06	6.0e-06
Copper	1.9e-04	1.3e-04	1.6e-04
Lead	4.3e-04	2.0e-04	3.2e-04
Manganese	1.1e-03	7.4e-04	9.2e-04
Nickel	1.6e-04	9.9e-05	1.3e-04
Selenium	3.1e-05	7.5e-06	1.9e-05
Silver	5.0e-05	6.8e-06	2.8e-05
Zinc	7.1e-04	3.7e-04	5.4e-04
Mercury	< 2.6e-05	5.9e-04	< 3.1e-04
Total Toxic Metals	**3.4e-03**	**2.5e-03**	**3.0e-03**

Standard Conditions: 70°F, 29.92 inches Hg

Table 3-5
Cement Lock Demonstration Site
Carbon Bed Inlet
Dioxins, Furans, and PCBs
Test Results Summary

Run No.	**1**	**2**	**Average**
Date	12/07/06	12/07-08/06	
Time Period	1406-1754	2026-0016	
Exhaust Gas Characteristics			
Oxygen (%-dry)	6.3	10.6	8.5
Carbon Dioxide (%-dry)	9.2	5.3	7.3
Temperature (° F)	345	342	344
Moisture (%)	49.3	48.1	48.7
Velocity (fps)	36.7	37.5	37.1
Flow Rate (ACFM)	15,551	15,890	15,721
Flow Rate (DSCFM)	5,117	5,368	5,243
Dioxins and Furans			
CDD Total Emission Rate (lb/hr)	6.8e-10	4.6e-10	5.7e-10
CDF Total Emissoin Rate (lb/hr)	9.2e-11	2.1e-10	1.5e-10
Dioxins Total Emission Rate (lb/hr)	7.7e-10	6.7e-10	7.2e-10
PCBs			
Total Emission Rate (lb/hr)	1.9e-03	1.4e-03	1.7e-03

Note: An individualized breakdown of the emission calculations for Dioxins, Furans, and PCBs can be found in Appendix B of this test report.

Standard Conditions: 70°F, 29.92 inches Hg

Table 3-6
Cement Lock Demonstration Site
Carbon Bed Outlet
Dioxins, Furans, and PCBs
Test Results Summary

Run No.	**1**	**2**	**Average**
Date	12/07/06	12/07-08/06	
Time Period	1406-1748	2026-0016	
Exhaust Gas Characteristics			
Oxygen (%-dry)	6.3	10.6	8.5
Carbon Dioxide (%-dry)	9.2	5.3	7.3
Temperature (° F)	290	289	290
Moisture (%)	49.5	49.6	49.6
Velocity (fps)	35.6	36.2	35.9
Flow Rate (ACFM)	14,684	14,922	14,803
Flow Rate (DSCFM)	5,252	5,336	5,294
Dioxins and Furans			
CDD Total Emission Rate (lb/hr)	3.4e-13	1.7e-13	2.6e-13
CDF Total Emissoin Rate (lb/hr)	6.7e-11	ND	6.7e-11
Dioxins Total Emission Rate (lb/hr)	6.7e-11	1.7e-13	3.4e-11
PCBs			
Total Emission Rate (lb/hr)	2.3e-04	9.7e-05	1.6e-04

ND = Not Detected

Note: An individualized breakdown of the emission calculations for Dioxins, Furans, and PCBs can be found in Appendix B of this test report.

Standard Conditions: 70°F, 29.92 inches Hg

Table 3-7
Cement Lock Demonstration Site
Carbon Bed Inlet
SVOCs
Test Results Summary

Run No.	**1**	**2**	**Average**
Date	12/07/06	12/07-08/06	
Test Period	1406-1754	2025-0016	
Stack Gas Characteristics			
Oxygen (%-dry)	6.3	10.6	8.45
Carbon Dioxide (%-dry)	9.2	5.3	7.25
Temperature (° F)	346	342	344
Moisture (%)	49.9	48.3	49.1
Velocity (fps)	37.2	37.3	37.3
Flow Rate (ACFM)	15,783	15,800	15,792
Flow Rate (DSCFM)	5,127	5,321	5,224
SVOCs (Emission Rate - lb/hr)			
Benzo(a)pyrene	5.0e-10	ND	< 5.0e-10
1-Methylnaphthalene	1.3e-08	1.9e-09	7.5e-09
2-Methylnaphthalene	1.6e-09	ND	< 1.6e-09
Naphthalene	1.3e-08	8.0e-09	1.1e-08
Phenanthrene	ND	1.0e-09	< 1.0e-09
Total SVOCs	**2.8e-08**	**1.1e-08**	**2.0e-08**

ND = Not Detected

Standard Conditions: 70°F, 29.92 inches Hg

Table 3-8
Cement Lock Demonstration Site
Carbon Bed Outlet
SVOCs
Test Results Summary

Run No.	**1**	**2**	**Average**
Date	12/07/06	12/07-08/06	
Test Period	1406-1748	2016-0018	
Stack Gas Characteristics			
Oxygen (%-dry)	6.3	10.6	8.45
Carbon Dioxide (%-dry)	9.2	5.3	7.25
Temperature (° F)	288	285	287
Moisture (%)	50.2	50.6	50.4
Velocity (fps)	35.4	35.0	35.2
Flow Rate (ACFM)	14,611	14,416	14,514
Flow Rate (DSCFM)	5,167	5,077	5,122
SVOCs (Emission Rate - lb/hr)			
Benzo(a)pyrene	ND	ND	ND
1-Methylnaphthalene	1.2e-08	ND	< 1.2e-08
2-Methylnaphthalene	ND	ND	ND
Naphthalene	4.5e-09	4.7e-09	4.6e-09
Phenanthrene	ND	ND	ND
Total SVOCs	**1.7e-08**	**4.7e-09**	**1.1e-08**

ND = Not Detected

Standard Conditions: 70°F, 29.92 inches Hg

Table 3-9
Cement Lock Demonstration Site
DRE of Toxic Metals
Test Results Summary

Run No.	Inlet (lb/hr)	Outlet (lb/hr)	DRE (% wt)
1	1.6e-02	3.4e-03	78.8
2	4.5e-03	2.5e-03	44.4
		Average	**61.6**

$$\text{DRE (\%)} = \frac{[\text{(lb/hr) Toxic Metal}_{in} - \text{(lb/hr) Toxic Metal}_{out}}{\text{(lb/hr) Toxic Metal}_{in}} \times 100\%$$

Table 3-10
Cement Lock Demonstration Site
DRE of Dioxins and Furans
Test Results Summary

Run No.	Inlet (lb/hr)	Outlet (lb/hr)	DRE (% wt)
1	7.7e-10	6.7e-11	91.3
2	6.7e-10	1.7e-13	99.9
		Average	**95.6**

$$\text{DRE (\%)} = \frac{[\text{(lb/hr) Dioxin}_{in} - \text{(lb/hr) Dioxin}_{out}}{\text{(lb/hr) Dioxin}_{in}} \times 100\%$$

Table 3-11
Cement Lock Demonstration Site
DRE of PCBs
Test Results Summary

Run No.	Inlet (lb/hr)	Outlet (lb/hr)	DRE (% wt)
1	1.9e-03	2.3e-04	87.9
2	1.4e-03	9.7e-05	93.1
		Average	**90.5**

$$\text{DRE (\%)} = \frac{[(\text{lb/hr})\ PCBs_n - (\text{lb/hr})\ PCBs_{out}}{(\text{lb/hr})\ PCBs_{in}} \times 100\%$$

Table 3-12
Cement Lock Demonstration Site
DRE of SVOCs
Test Results Summary

Run No.	Inlet (lb/hr)	Outlet (lb/hr)	DRE (% wt)
1	2.8e-08	1.7e-08	39.3
2	1.1e-08	4.7e-09	57.3
		Average	**48.3**

$$\text{DRE (\%)} = \frac{[(\text{lb/hr})\ SVOCs_{in} - (\text{lb/hr})\ SVOCs_{out}}{(\text{lb/hr})\ SVOCs_{in}} \times 100\%$$

4.0 Test Methodologies

The emission evaluation test program was conducted in determination of the following emission parameters utilizing the specified methodologies.

Table 4-1
Cement Lock Demonstration Site
Emission Evaluation Test Program
Test Methodology Summary

Emission Parameter	No. of Test Runs	Test Location	Sampling and Analytical Methodology
Traverse Point Location	*	Inlet/Outlet	EPA Reference Method 1
Volumetric Flow Rate	*	Inlet/Outlet	EPA Reference Method 2
Oxygen, Carbon Dioxide	*	Inlet/Outlet	EPA Reference Method 3 and 3A
Moisture Content	*	Inlet/Outlet	EPA Reference Method 4
Sulfur Dioxide	3	Outlet	EPA Reference Method 6C
Nitrogen Oxides	3	Outlet	EPA Reference Method 7E
Carbon Monoxide	3	Outlet	EPA Reference Method 10
Volatile Organic Compounds	3	Outlet	EPA Reference Method 25A
Specific Volatile Organic Compounds	2	Inlet/Outlet	Modified EPA Reference Method 5
Dioxins and Furans	2	Inlet/Outlet	EPA Reference Method 23
Polychlorinated Biphenyls	2	Inlet/Outlet	EPA Reference Method 23
Hydrogen Chloride and Chlorine	2	Outlet	EPA Reference Method 26A
Toxic Metals	2	Inlet/Outlet	EPA Reference Method 29

* These parameters were determined concurrently with all other emission parameters.

A description of the above referenced test methodologies is provided below.

4.1 Cyclonic Flow

The absence of cyclonic flow was demonstrated at each sampling location according to

Section 11.4 of EPA Reference Method 1. An S-type pitot was connected to a manometer. The pitot tube was placed in such a position that the openings of the pitot tube were perpendicular to the stack gas flow. An angle finder was placed on the pitot tube which was rotated until a reading of zero (0) is obtained. The 'yaw' angle was then recorded. The cyclonic flow traverse was performed at the traverse point locations specified in Tables 2-1 and 2-2.

4.2 Stack Gas Velocity and Volumetric Flow Rate Determination

The determination of stack gas velocity and volumetric flow rate was performed in accordance with EPA Reference Method 2. Velocity traverses across the stack diameter at each test location were performed using an S-type pitot tube and type-K thermocouple. The S-type pitot tube was connected to an inclined vertical manometer via leak-free connections. The type-K thermocouple was connected to a digital temperature indicator for signal output. These readings were observed and recorded at each traverse point for each test run.

A post-test leak check of the S-type pitot tube, the manometer and the interconnecting tubing was performed in accordance with the procedure described in EPA Reference Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Pitot Tube)."

4.3 Moisture Content

All moisture content determinations followed EPA Reference Method 4, Section 2.2.2 as necessary. Determinations conducted by EPA Method 4 utilized large capacity impingers and collected a minimum volume of 30 DSCF.

4.4 Gaseous Emissions Sampling System

An extractive sampling system was used to continuously determine O_2, CO_2, CO, NO_X, SO_2, and VOC concentrations. A representative sample of the flue gas was extracted through a heated (225°F) stainless steel probe and filter assembly, and transported via a heat-traced Teflon sample

line through a heated glass fiber filter and a Teflon lined diaphragm sample pump to a condensation removal trap located in a mobile laboratory. VOC samples bypassed the condensation trap. A heated out-of-stack filter assembly was maintained at a sufficient temperature to prevent water condensation. A three-way valve was utilized to block sample gas flow and introduce calibration gases to the measurement system at the outlet of the sampling probe during system calibrations. The condensation trap was cooled to approximately 40°F. The sample was exhausted from the trap free of moisture and particulate matter. The sample was introduced into a constant-pressure manifold constructed of stainless steel and Teflon for metered distribution to the respective analyzers.

Output signals from all instrumental analyzers were stored on strip chart recorders as well as a personal computer (PC) based data acquisition system (DAS). All reference method data was reported from the DAS. The strip chart recorders were used for a backup record. All continuous analyzers utilized for the RM testing provided a linear response to the DAS over the calibrated range. This was verified by the pre-test calibration results.

4.4.1 Oxygen and Carbon Dioxide

Oxygen and carbon dioxide concentrations of the stack gases were determined by EPA Reference Method 3A. The sampling system was as described above. Oxygen concentrations were determined using a paramagnetic oxygen analyzer. The oxygen analyzer was operated in the 0-22.05% range. Carbon dioxide concentrations were determined using a non-dispersive infared analyzer which was operated in a range of 0-12.36%. Calibration gases were 0-20% (zero gas), 45-55% and 80-100% of the calibration span, which is defined as the range from zero to the actual high span gas cylinder concentration. All calibration gases were Protocol 1 grade (± 1%). A sampling system bias check was performed prior to the first test run by introducing the zero gas and the mid-

level span gas at the sample probe/sample line interface. The sampling system bias check was repeated after each test run to determine the instrument zero and calibration drift. Oxygen and carbon dioxide concentrations were determined simultaneously with all sampling events.

In addition, oxygen and carbon dioxide concentrations were determined by EPA Reference Method 3. The sampling train consisted of a stainless steel probe with a glass fiber filter for particulate filtration. The sampling probe was attached to a water cooled condenser used to remove excess moisture from the sample stream. The condenser was attached to a leak-free diaphragm pump with an in-line needle valve to adjust the sample flow rate. The sampling train was leak-checked in accordance with the procedure described in EPA Reference Method 3, presampling run. The sample stream then passed through a surge tank (eliminating the pulsation effects of the pump) and a rotameter, which measures the sampling flow rate to within ±2% of the selected flow rate for the test, into a leak-free Tedlar bag.

Determination of percent CO_2 and O_2 was performed using a Fisher Type B No. 10-605 ORSAT gas analyzer which uses the principle of gas absorption in specific absorbing solutions. All Tedlar bags utilized for this sampling underwent the leak check procedure specified in EPA Method 10.

4.4.2 Nitrogen Oxides

Nitrogen oxides concentrations were determined by EPA Reference Method 7E. The principle of this method is to continuously extract a gaseous sample of flue gas and introduce a portion of this sample into a chemiluminescent analyzer for the determination of concentration. The principle of the analyzer is based on the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2 + \text{a photon}$$

The photons emitted by the reaction are measured by a photomultiplier tube. The

photomultiplier signal is proportional to the number of NO molecules; therefore, the photomultiplier signal is recorded as the concentration for NO_x. The sample flowrate is carefully controlled. NO_x is comprised of NO and NO_2. NO_2 present in the sample gas is converted into NO prior to entering the reaction chamber by a NO_2 to NO converter. The NO_2 to NO converter breaks one [1] of the two [2] nitrogen-oxygen bonds by passing the sample gas through capillary tubing into an electronically controlled, heated catalytic converter. Calibration gases were 0-20% (zero gas), 45-55% and 80-100% of the calibration span. All calibration gases were NIST traceable Protocol 1. A zero and midpoint bias calibration was performed from the sample probe both before and after each test run. Output signals were stored and processed by a PC based DAS system as well as a strip chart recorder. The analyzer was operated in the 0-448.1 ppmV range. A NO_X converter calibration was performed immediately prior to the start of sampling.

4.4.3 Carbon Monoxide

Carbon monoxide concentrations were determined by gas filter correlation spectroscopy. A representative sample of stack gas is directed to the analyzer via the sample transport system described above. The sample enters the analyzer and is passed through the sample cell. Radiation from an infrared source is chopped then passed through a gas filter which alternates between CO and N_2 due to the rotation of the filter wheel. The radiation then passes through a narrow band pass interference filter and enters a multiple optical cell where absorption by the sample gas occurs. The IR radiation then exits the sample cell and is focused on the detector. The CO gas filter acts to produce a reference beam which cannot be further attenuated by CO in the sample cell. The N_2 side of the gas filter is transparent to the IR radiation. This beam is absorbed by CO present in the sample. Absorption of the IR beam by CO in the sample causes a proportional

difference in the signals from the sample and reference cell beams. This difference is converted electronically into an output signal that is linearly proportional to the concentration of CO in the sample. Before and after each sample run, the analyzer was calibrated with NIST Protocol 1 Grade (± 1%) traceable calibration gases. Calibration gases were 0-20% (zero gas), 45-55% and 80-100% of the calibration span. The analyzer was operated in the 0-89.6 ppmV range. A zero and midpoint bias calibration was performed from the sample probe both before and after each test run. Output signals were stored and processed by a PC based DAS system as well as a strip chart recorder.

4.4.4 Volatile Organic Compounds

Volatile organic compound emissions were determined by directing a portion of the sample into a total hydrocarbon analyzer equipped with a flame ionization detector (FID). With the total hydrocarbon analyzer, sample gas is transported to the FID via a heated sample train. All hydrocarbon species present are ionized simultaneously to produce the signal output. The THC-FID was calibrated with NIST traceable Protocol 1 grade methane calibration gases. Three (3) calibration gases of 20-30%, 45-55% and 80-90% of span were utilized. A zero and midpoint bias calibration was performed for the continuous FID both before and after each test run. The THC-FID was operated in the 0-100 ppmV range. Output signals from the THC-FID were stored and processed by a PC based DAS system and strip chart recorder.

4.4.5 Sulfur Dioxide

Sulfur dioxide concentrations were determined in accordance with EPA Reference Method 6C utilizing a UV photometric analyzer.

The analyzer is comprised of a single ultraviolet source, a chopper wheel containing two interference filters, a beam splitter, one measuring cell, one reference cell and two matched

photodetectors. During SO_2 measurement, two wavelengths are used - one which is absorbed by SO_2 is used for the measuring wavelength (285 nm) and one which is not absorbed by SO_2 or other components normally in the gas sample stream is used as a reference wavelength (585nm). The sample flows through the measuring cell while the reference cell contains only non-absorbing gases. As the chopper wheel rotates, a flash of radiation passes through the measuring filter to the beam splitter. After a brief period, a flash of radiation passes through the reference filter to reference filter to the beam splitter. These flashes of measuring and reference radiation continue at a nominal frequency of 52 times per second per filter. The beam splitter directs half the radiation through the measuring cell and half through the reference cell to the two detectors which develop electrical signals proportional to the amount of radiation that impinged on the detectors. The detector signals are demultiplexed into two measuring signals and two reference signals. The reference signals are used to automatically control the gain of each detector to independently compensate each path for optical contamination. The detector signal developed from the measuring wavelength radiation that passes through the reference cell is used to control the current to the ultraviolet source. The two detector signals developed from the reference wavelength radiation that pass through the measuring and reference cell are used to produce an analyzer output signal that is proportional to the SO_2 concentration in the measuring cell.

The SO_2 analyzer was calibrated prior to the start of sampling with NIST traceable, Protocol grade calibration gases. The analyzer was operated in the 0-500 ppmV range. A sampling system bias check was performed prior to the first test run by introducing the zero gas and the mid-level span gas at the sample probe/sample line interface. The sampling system bias check was repeated after each test run to determine the instrument

zero and calibration drift.

4.5 Toxic Metals

Metals in the exhaust gases were determined isokinetically using EPA Reference Method 29 "Methodology for the Determination of Metal Emissions in Exhaust Gases from Hazardous Waste Incinerator Processes".

Metals sampling occurred during 2-hour sampling events. Triplicate test runs were performed with each collecting a minimum volume of 60 DSCF. The sampling train consisted of the following components:

- Quartz glass sample nozzle and probe
- Heated glass fiber filter
- A modified Greenburg Smith impinger containing 100 ml of a 5% HNO_3/10% H_2O_2
- A Greenburg-Smith impinger containing 100 ml 5% HNO_3/10% H_2O_2
- Modified Greenburg-Smith impinger initially empty
- Two (2) modified Greenburg-Smith impingers containing 100 ml 4% $KMnO_4$/10% H_2SO_4 solution
- An impinger containing approximately 225 g of silica gel desiccant
- Dry gas meter equipped with inlet and outlet thermocouples

The sample was extracted from the exhaust stream using a vane-type vacuum pump. Isokinetic sampling conditions were maintained through the use of a type "S" pitot tube to monitor the exhaust gas stream pressure differentials. A type "K" thermocouple was utilized to determine the exhaust gas temperature.

At the completion of sampling, the probe liner, nozzle, and front half of the filter housing were rinsed and brushed with 100 ml of a 0.1N nitric acid reagent and the washings were placed in a glass amber container retained for analysis. The filter was removed from the filter holder and placed in a petri dish and sealed. The contents of impingers 1 and 2 were measured for volume increase and placed in a second glass amber container. Impingers 1 and 2 and the back half of the filter housing

were then rinsed with a total of 100 ml 0.1N nitric acid and the washings were placed in a third glass amber container. The contents of impinger 3 were measured for volume increase and placed in a fourth glass amber container along with a total of 100 ml 0.1N nitric acid washings. Impingers 4 and 5 were measured for volume increase and placed in a fifth glass amber container along with a total of 100 ml each of the fresh permanganate and distilled water rinses of all sample exposed areas for the two (2) impingers. Impingers 4 and 5 were then rinsed with a total of 25 ml of 8N HCl which was placed in a sixth glass amber container. The silica gel was recovered from the last impinger and placed in a sealed container for weight gain determination.

Prior to analysis, the collected front and back half liquid sample volumes were reduced. The filter was acid digested in accordance with the method prior to being combined with the probe rinse for analysis. Arsenic, barium, cadmium, chromium, copper, nickel, lead, selenium, silver, and zinc were determined by graphite furnace atomic absorption spectrophotometry (GFAA). Mercury was determined by cold vapor atomic absorption spectrophotometry (CVAA). Cobalt and manganese were analyzed by inductively coupled plasma-optical emission spectroscopy (ICP).

4.6 Specific Volatile Organic Compounds

SVOCs were determined utilizing a modified EPA Reference Method 5/Solid Waste Method 0010 sampling train. The sampling train consisted of the following apparatus connected in series:

- **Quartz glass probe and stainless steel nozzle**
- **Glass fiber filter contained within a heated filter holder**
- **Glass coil type condenser (water jacketed)**
- **Glass adsorbent trap containing 30 grams of XAD-2 adsorbent resin (water jacketed)**
- **A water-knockout impinger**
- **A modified Greenburg-Smith impinger containing 100 ml of distilled water**
- **A Greenburg-Smith impinger containing 100 ml of distilled water**
- **A modified Greenburg-Smith impinger-empty**
- **A modified Greenburg-Smith impinger containing 250 g of silica gel desiccant**

All glassware utilized in the sampling was pre-cleaned as described in Section 3A of the "Manual of Analytical Methods for the Analysis of Pesticides in Human and Environmental Samples".

Sampling was conducted in duplicate 3-hour sampling events with each collecting a minimum sample volume of 105 DSCF. Prior to the start of sampling, a leak check was conducted at 15 in. Hg vacuum to ensure that all connections were leak free. The following information was recorded at each traverse point:

- **Stack temperature**
- **Dry gas meter temperature**
- **Stack gas pressure differential**
- **Differential pressure across the orifice meter**

At the completion of sampling, a post run leak check was conducted followed by sample recovery. The nozzle and probe were removed from the sampling train and both ends were capped. The filter was removed from the filter holder and placed in an identified container. The adsorbent module was capped and covered with foil. The nozzle, probe, front half of the filter holder, back half of the filter holder and the condenser were brushed and rinsed with acetone three (3) times, followed by three (3) rinses with methylene chloride. Both rinses were collected and stored in an amber glass jar with a Teflon lined lid. All rinses were combined later during analysis. The volume of the first four (4) impingers was determined and each were then rinsed three (3) times with deionized water. The contents were retained for analysis along with the deionized water rinses and the front half acetone and methylene chloride rinses. The silica gel was recovered from the fifth impinger and placed in a sealed polyethylene container.

Analysis of the samples occured by Soxhlet extraction and concentration of the

aqueous matrices, followed by high resolution gas chromatography/mass spectrometry [GC/MS] analysis.

4.7 Dioxins, Furans, and Polychlorinated Biphenyls

Dioxins, furans, and PCBs from each test location were determined according to the procedures detailed in EPA Reference Method 23. The sampling train consisted of the following apparatus connected in series:

- Quartz glass probe and stainless steel nozzle
- Glass fiber filter contained within a heated filter holder
- Glass coil type condenser (water jacketed)
- Glass adsorbent trap containing 30 grams of XAD-2 adsorbent resin (water jacketed)
- A water-knockout impinger
- A modified Greenburg-Smith impinger containing 100 ml of distilled water
- A Greenburg-Smith impinger containing 100 ml of distilled water
- A modified Greenburg-Smith impinger-empty
- A modified Greenburg-Smith impinger containing 250 g of silica gel desiccant

All glassware utilized in the sampling was pre-cleaned as described in Section 3A of the "Manual of Analytical Methods for the Analysis of Pesticides in Human and Environmental Samples".

Sampling was conducted in duplicate 3-hour sampling events with each event collecting a minimum sample volume of 105 DSCF. Prior to the start of sampling, a leak check was conducted at 15 in. Hg vacuum to ensure that all connections were leak free. The following information was recorded at each traverse point:

- Stack temperature
- Dry gas meter temperature
- Stack gas pressure differential
- Differential pressure across the orifice meter
- Sample box temperature
- Impinger temperature
- Condenser exit temperature

At the completion of sampling, a post run leak check was conducted followed by sample recovery. The nozzle and probe was removed from the sampling train and both ends were capped.

The filter was removed from the filter holder and placed in an identified container. The adsorbent module was capped and covered with foil. The nozzle, probe, front half of the filter holder, back half of the filter holder and the condenser were brushed and rinsed with acetone three (3) times and were collected and stored in an amber glass jar with a Teflon lined lid. The glassware was then rinsed with toluene and stored in a separate amber glass jar with a Teflon lid. All rinses were combined later during analysis. The volume of impingers 1, 2, 3, and 4 was determined for moisture gain and the contents placed in an amber glass jar with a Teflon lined lid. The pH was measured of the impinger solution, and was found to be greater than 4.5. Therefore, the impinger solution was not neutralized with 0.1N NaOH. The four impingers were rinsed three (3) times each with deionized water and were collected and stored in an amber glass jar with a Teflon lined lid. The silica gel was recovered from the fifth impinger and placed in a sealed polyethylene container.

Analysis of the samples for dioxins, furans, and PCBs involved Soxhlet extraction and concentration of the aqueous matrices, followed by high resolution gas chromatography/mass spectrometry [GC/MS] analysis.

Emissions calculations for dioxins, furans, and PCBs can be found in Appendix B of this test report.

A full list of each PCB compound can also be found in Appendix B directly before the dioxins, furans, and PCBs emission calculation spreadsheets.

4.8 Hydrogen Chloride and Chlorine

Emissions of hydrogen chloride and chlorine were determined using an EPA Reference Method 26A sampling train. The samples were collected isokinetically. The sample train consisted of the following apparatus connected in series:

- Quartz probe and nozzle
- A desiccated, tared quartz filter within a heated borosilicate glass filter holder with a Teflon frit

- A modified Greenburg-Smith impinger containing 100 ml of 0.1 N H_2SO_4
- A Greenburg-Smith impinger containing 100 ml of 0.1 N H_2SO_4
- A Greenburg-Smith impinger containing 100 ml of 0.1 NaOH
- A modified Greenburg-Smith impinger containing 100 ml of 0.1 NaOH
- A modified Greenburg-Smith impinger containing approximately 250 g of silica gel desiccant
- Vane type pump
- Dry gas meter equipped with thermocouples

An S-type pitot tube was attached to the sample probe to monitor exhaust gas stream pressure differentials in order to maintain isokinetic sampling conditions and determine the volumetric flow rate. A type-K thermocouple was also attached to measure the exhaust gas temperature. The glass fiber filter was maintained at a temperature greater than 248 °F.

Two (2) 1-hour test runs were conducted with each event collecting a minimum of 30 DSCF. Prior to the start of sampling, a leak check was conducted at 15 in. Hg vacuum to insure that all connections were leak free. The following information was recorded at each traverse point:

- Dry gas meter volume
- Stack Temperature
- Dry gas meter temperature (inlet and outlet)
- Stack gas pressure differentials
- Differential pressure across the orifice meter
- Filter temperature in heated compartment
- Gas temperature exiting the fourth impinger (silica gel desiccant)

At the completion of sampling, the sampling train was post run leak checked at the maximum vacuum encountered during the test run and then disassembled and the sample fractions recovered. The quartz filter was removed and placed in a polyethylene container. All sample exposed areas of the front half of the sampling train (nozzle, probe and front half of the filter holder) were brushed and rinsed three (3) times with acetone and placed in a polyethylene container. The volume of impingers 1 and 2 was measured with a graduated cylinder and the contents were placed in a polyethylene container. The volume of impingers 3 and 4 was measured with a graduated cylinder and the contents were placed in a separate polyethylene container. The back half of the filter holder,

impinger 1, and impinger 2 were washed with distilled/deionized water and placed in the same polyethylene container as the original contents of impingers 1 and 2. Impingers 3 and 4 were washed with distilled/deionized water and placed in the same polyethylene container as the original contents of impingers 3 and 4. The silica gel desiccant was removed from the last impinger and placed in its original tared polyethylene container. The samples were then transported to the AirNova, Inc. laboratory facility for subsequent analysis.

Analysis of the HCl samples was performed using a Bacharach TriDet HPLC equipped with a nonsuppressed conductivity detector. An Alltech Anion/R 10 um, 250 x 4.1 mx (or equivalent) column was used for separation of ionic species. A 4.0 g/l p-HBA (2.5% MeOH) buffer solution adjusted to a pH of 4.0 - 4.4 with LiOH was used as the eluent.

Prior to calibration and sample analysis, a stable baseline was established. The calibration curve was generated using four (4) concentrations of Cl plus a zero standard. The standards were prepared using IC high quality standards.

During the analysis of the HCl, the four (4) calibration standards were prepared for each contaminant in concentrations that were within the linear range of the field samples. The calibration standards, starting at the lowest first, were injected both before and after injection of the quality control check sample, reagent blanks, and field samples.

Chlorine was determined to be non-detectable after analysis of the samples.

4.9 Process Operating Data

The process operating conditions were documented by the plant control room personnel. The data included information such as: production rate, fuel use and any other applicable process data. All process data is included in Appendix E of this test report.

During the testing period on December 7, 2006, the following abnormal process operations had occurred:

- For a few hours after 14:45, no sediment material was fed into the unit for processing.
- At 22:45, there was a flame out on the burner and it was never reignited. At 02:00 on December 8, 2006, the unit was shut down.

5.0 Quality Assurance/Quality Control Procedures

All of the source sampling and analytical procedures were performed in accordance with the US EPA's 'Good Laboratory Practice' guidelines. AirNova, Inc. followed the requirements of the individual test methods to ensure the precision and accuracy of the source testing procedures. In addition, AirNova, Inc. followed the procedures provided in the 'Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Sources'. Sampling equipment that was utilized in the test program was calibrated prior to the test performance. The following procedures were utilized.

5.1 S-Type Pitot Tubes

The S-type pitot tubes were visually inspected to verify dimension requirements. Pitot tubes meeting requirements were assigned a pitot tube coefficient of 0.84. Pitot tubes which did not meet the requirements were not utilized.

5.2 Dry Gas Meters and Orifice Meters

All dry gas meters used in the field were calibrated against a transfer standard dry gas meter that is maintained in AirNova's calibration data. The transfer standard gas meter is calibrated annually and certified against an NIST traceable Bell-type Prover which operates by liquid displacement.

Field dry gas meters and orifice meters are calibrated at two month intervals at the following

orifice meter settings:

- 0.5 in. H_2O
- 1.0 in. H_2O
- 2.0 in. H_2O
- 3.0 in. H_2O
- 4.0 in. H_2O
- 5.0 in. H_2O

The initial and final volume readings and temperature readings were recorded for the dry gas meter and the secondary standard test meter at each orifice meter setting. A dry gas meter correction factor (DGMCF) was calculated for each setting and the average DGMCF was recorded.

All calibration documentation is stored in a designated filing cabinet for future reference. All repair and maintenance documentation for each meter is stored in files that provide a history of each meter and aid in our preventative maintenance program.

AirNova, Inc. also participates in the EPA Method 5 Dry Gas Meter Audit Program.

5.3 Nozzles

Probe nozzles selected for isokinetic sampling were calibrated according to section 3.4.2 of the "Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III" Upon receipt, the inner diameter of each nozzle is measured across three (3) distinct diameters with a micrometer caliper. The calibrated nozzle diameter is the average of these measurements. Each nozzle is identified uniquely and its calibrated diameter is checked prior to use.

5.4 Thermocouples

Thermocouples and thermometers utilized in the sampling program were calibrated according to section 3.4.2 of the "Quality Assurance for Air Pollution Measurement Systems: Volume III" every two months. The calibration method includes comparing each field thermometer and thermocouple at different temperatures to an ASTM certified mercury-in-glass thermometer. The temperatures

must agree within the tolerances mentioned for the type of sampling equipment being calibrated. All the calibration data is stored in a designated filing cabinet for future reference.

1. Stack Gas and Filter Housing Thermocouples and Thermometers
   Three temperatures are measured and extrapolated over the range of temperatures encountered in field operations. The three temperatures used for calibration are:
   1. Ice bath
   2. Boiling point of water
   3. Boiling point of cooking oil (or equivalent in solid salt bath)

2. Impinger Thermometers and Thermocouples
   Two temperatures are required to calibrate:
   1. Ice bath
   2. Stabilized room temperature

3. Dry Gas Thermometers
   Two temperatures are required to calibrate:
   1. Stabilized hot water bath at approximately 104 - 122°F (40 - 50°C)
   2. Stabilized room temperature

5.5 Labels

All samples collected as part of the sampling program (silica gel desiccant samples) were affixed with labels which identify the following: 1) Project No., 2) Date, 3) Type of sample, 4) Run No., 5) Sample location, and 6) Sample fraction.

5.6 Chain-of-Custody Documentation

Chain-of-custody documentation for all samples was implemented at the completion of sampling and sample clean-up and was documented until the samples were received by the laboratory for analysis.

5.7 Calibration Gases

- NIST Traceable Protocol 1 grade (±1%) gas standards were utilized for calibration of the NO_x, O_2, CO_2, CO, $\mathbf{SO_2}$ and THC analyzers.

APPENDIX B.

DETAILED CHEMICAL ANALYSES OF PASSAIC RIVER SEDIMENT FEED AND ECOMELT PRODUCT

(Includes SPLP and TCLP test results on Ecomelt and Ecomelt mortar samples)

TABLE 1. ANALYTICAL RESULTS OF INPUT SEDIMENT SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SS-01	P2-SS-02	P2-SS-03	P2-SS-03 (Dup)	P2-SS-04	P2-SS-05	P2-SS-06	Average**
PCBs										
1-MoCB	Congeners	pg/g	1,370 J	1,370 J	1,820 J	2,380 J	2,720	1,640	2,180 J	1,926
2-MoCB	Congeners	pg/g	1,350 J	1,220 J	1,130 J	1,550 J	1,320	1,710	1,930 J	1,459
3-MoCB	Congeners	pg/g	1,910 J	1,920 J	2,270 J	3,250 J	3,220 J	2,680	2,980 J	2,604
4-DiCB	Congeners	pg/g	10,100 J	7,810 J	9,780 J	11,500 J	9,520 J	9,730 J	8,870	9,616
5-DiCB	Congeners	pg/g	2,880	1,950	3,330 U	3,920	3,960	2,170	2,830	3,006
6-DiCB	Congeners	pg/g	7,120	5,320	8,800	11,100	11,400	6,290	6,700	8,104
7-DiCB	Congeners	pg/g	1,570	1,070	1,320	1,270	1,610	1,340	1,480	1,380
8-DiCB	Congeners	pg/g	26,500	20,000	21,000	26,900	25,700	24,800	26,600	24,500
9-DiCB	Congeners	pg/g	1,710	1,250	1,880	2,520	2,370	1,450	1,610	1,827
10-DiCB	Congeners	pg/g	223 U	387	1,310	1,480	1,310	207 U	388 U	758
11-DiCB	Congeners	pg/g	44,500	30,400	38,100	46,200	44,500	37,500	39,200	40,057
12-DiCB	Congeners	pg/g	7,460 C	6,010 C	8,430 C	10,200 C	10,100 C	7,220 C	7,430 C	8,121 C
13-DiCB	Congeners	pg/g	C12	C12	C12	C12	C12	C12	C12	
14-DiCB	Congeners	pg/g	349 U	149 U	352 U	540 U	471 U	216 U	220 U	328 U
15-DiCB	Congeners	pg/g	32,200	27,600	30,500	40,100 J	36,900	31,100	33,000 J	33,057
17-TrCB	Congeners	pg/g	34,200	25,000	36,100	35,200	38,200	26,300	29,100	32,014
18-TrCB	Congeners	pg/g	55,500 C	41,400 C	63,300 C	61,800 C	69,600 C	42,000 C	49,700 C	54,757 C
19-TrCB	Congeners	pg/g	9,920	7,230	11,300 J	13,900	12,500 J	8,830	10,400	10,583
20-TrCB	Congeners	pg/g	120,000 C	95,700 C	121,000 C	124,000 C	126,000 C	97,700 C	106,000 C	112,914 C
21-TrCB	Congeners	pg/g	42,900 C	33,100 C	45,200 C	45,900 C	49,000 C	34,500 C	34,300 C	40,700 C
22-TrCB	Congeners	pg/g	37,900	27,200	33,000	32,200	35,100	29,900	32,300	32,514
23-TrCB	Congeners	pg/g	69 U	89 U	91 U	135 U	110 U	76 U	74 U	92 U
24-TrCB	Congeners	pg/g	1,910	12,000	2,610	17,700	19,900	1,080	1,260	8,066
25-TrCB	Congeners	pg/g	15,000	11,600	15,200	15,500	17,200	12,500	12,500	14,214
26-TrCB	Congeners	pg/g	20,300 C	15,500 C	20,100 C	18,300 C	20,600 C	17,300 C	17,800 C	18,557 C
27-TrCB	Congeners	pg/g	6,620	5,470	7,390	149 U	6,770	5,330	6,040	5,396
28-TrCB	Congeners	pg/g	C20	C20	C20	C20	C20	C20	C20	
29-TrCB	Congeners	pg/g	C26	C26	C26	C26	C26	C29	C26	
30-TrCB	Congeners	pg/g	C18	C18	C18	C18	C18	C18	C18	
31-TrCB	Congeners	pg/g	97,700	77,700	91 U	135 U	110 U	84,000	85,300	49,291
32-TrCB	Congeners	pg/g	28,200	22,500	26,600	25,900	26,900	19,700	25,500	25,043
33-TrCB	Congeners	pg/g	C21	C21	C21	C21	C21	C21	C21	
34-TrCB	Congeners	pg/g	879	642	105 U	155 U	127 U	656	652	459
35-TrCB	Congeners	pg/g	3,840	3,280	222 U	5,550	3,870	3,770	3,970	3,500 U
36-TrCB	Congeners	pg/g	180 U	174 U	208 U	319 U	248 U	132 U	175 U	205 U
37-TrCB	Congeners	pg/g	34,800	31,100	31,300	31,100	30,100	28,600	33,200	31,457
38-TrCB	Congeners	pg/g	190 U	184 U	223 U	342 U	266 U	140 U	184 U	218 U
39-TrCB	Congeners	pg/g	899	615	912	906	1,090	741	164 U	761
40-TeCB	Congeners	pg/g	61,900 C	56,100 C	53,400	66,000 C	62,600 C	59,100 C	67,200 C	60,900 C
41-TeCB	Congeners	pg/g	4,080	3,570	6,040 C	5,450	6,040	4,050	5,630	4,980
42-TeCB	Congeners	pg/g	37,700	35,500	33,400	39,100	37,400	35,800	41,000	37,129
43-TeCB	Congeners	pg/g	4,690	4,170	3,690	4,400	5,870	4,530	4,700	4,579
44-TeCB	Congeners	pg/g	156,000 C	135,000 C	132,000 C	158,000 C	147,000 C	141,000 C	164,000 C	147,571 C
45-TeCB	Congeners	pg/g	42,700 C	41,200 C	44,500 C	49,000 C	43,500 C	41,300 C	45,200 C	43,914 C
46-TeCB	Congeners	pg/g	8,570	8,190	9,260	10,900	10,200	8,870	9,070	9,294
47-TeCB	Congeners	pg/g	C44	C44	C44	C44	C44	C44	C44	
48-TeCB	Congeners	pg/g	23,100	18,300	21,300	24,900	26,400	20,200	22,200	22,343
49-TeCB	Congeners	pg/g	93,900 C	81,100 C	79,500 C	96,800 C	92,900 C	84,700 C	95,300 C	89,171 C

TABLE 1. ANALYTICAL RESULTS OF INPUT SEDIMENT SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SS-01	P2-SS-02	P2-SS-03	P2-SS-03 (Dup)	P2-SS-04	P2-SS-05	P2-SS-06	Average**
50-TeCB	Congeners	pg/g	23,500 C	23,000 C	25,700 C	29,400 C	26,800 C	24,900 C	25,900 C	25,600 C
51-TeCB	Congeners	pg/g	C45	C45	C45	C45	C45	C45	C45	
52-TeCB	Congeners	pg/g	145,000	125,000	140,000	165,000	152,000	132,000	151,000	144,286
53-TeCB	Congeners	pg/g	C50	C50	C50	C50	C50	C50	C50	
54-TeCB	Congeners	pg/g	3,260	2,750	2,820	3,810	2,860	72 U	3,230 J	2,686
55-TeCB	Congeners	pg/g	254 U	202 U	2,220	4,250	279 U	1,700	2,440	1,621
56-TeCB	Congeners	pg/g	52,300	43,100	32,800	39,800	39,000	44,400	52,500	43,414
57-TeCB	Congeners	pg/g	667	678	543	663	725	234 U	610	589
58-TeCB	Congeners	pg/g	247 U	641	3,930	4,520	4,160	4,670	365 U	2,648
59-TeCB	Congeners	pg/g	12,700 C	12,600 C	13,500 C	15,900 C	14,000 C	12,400 C	14,000 C	13,586 C
60-TeCB	Congeners	pg/g	14,500	12,000	10,800	14,300	13,900	12,600	14,200	13,186
61-TeCB	Congeners	pg/g	231,000 C	187,000 C	171,000 C	210,000 C	209,000 C	200,000 C	234,000 C	206,000 C
62-TeCB	Congeners	pg/g	C59	C59	C59	C59	C59	C59	C59	
63-TeCB	Congeners	pg/g	4,350	4,010	4,080	4,890	298 U	4,150	397 U	3,168
64-TeCB	Congeners	pg/g	54,600	48,400	51,700	63,200	58,200	50,100	58,600	54,971
65-TeCB	Congeners	pg/g	C44	C44	C44	C44	C44	C44	C44	
66-TeCB	Congeners	pg/g	108,000	94,200	89,600	111,000	105,000	96,300	107,000	101,586
67-TeCB	Congeners	pg/g	4,060	3,510	3,410	4,430	4,630	3,980	4,470	4,070
68-TeCB	Congeners	pg/g	245 U	1,320	1,070	1,330	1,290	208 U	1,280	963
69-TeCB	Congeners	pg/g	C49	C49	C49	C49	C49	C49	C49	
70-TeCB	Congeners	pg/g	C61	C61	C61	C61	C61	C61	C61	
71-TeCB	Congeners	pg/g	C40	C40	C40	C40	C40	C40	C40	
72-TeCB	Congeners	pg/g	1,420	1,280	265 U	1,590	1,460	1,480	372 U	1,124
73-TeCB	Congeners	pg/g	4,970	1,120	3,190 U	5,330	4,470	1,250	1,780	3,159
74-TeCB	Congeners	pg/g	C61	C61	C61	C61	C61	C61	C61	
75-TeCB	Congeners	pg/g	C59	C59	C59	C59	C59	C59	C59	
76-TeCB	Congeners	pg/g	C61	C61	C61	C61	C61	C61	C61	
77-TeCB	Congeners	pg/g	11,000 J	10,300	10,300	24,400 J	12,500	10,900	11,300 J	12,957
78-TeCB	Congeners	pg/g	279 U	222 U	271 U	332 U	302 U	237 U	412 U	294 U
79-TeCB	Congeners	pg/g	1,570	185 U	1,310	1,930	1,330	1,430	2,050	1,401
80-TeCB	Congeners	pg/g	241 U	191 U	232 U	284 U	258 U	205 U	355 U	252 U
81-TeCB	Congeners	pg/g	261 U	201 U	217 U	270 U	249 U	201 U	374 U	253
82-PeCB	Congeners	pg/g	13,100	13,300	12,400	14,100	13,400	13,100	14,000	13,343
83-PeCB	Congeners	pg/g	6,670	6,370	4,800	5,250	8,360	3,030	6,450	5,847
84-PeCB	Congeners	pg/g	33,700	32,700	28,700	35,300	30,000	31,000	35,500	32,414
85-PeCB	Congeners	pg/g	18,100 C	17,900 C	15,000 C	20,400 C	19,600 C	17,000 C	19,600 C	18,229 C
86-PeCB	Congeners	pg/g	74,400 C	70,200 C	65,800 C	79,300 C	70,700 C	68,700 C	74,500 C	71,943 C
87-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
88-PeCB	Congeners	pg/g	11,100 C	22,500 C	22,700 C	27,100 C	23,200 C	23,100 C	25,500 C	22,171 C
89-PeCB	Congeners	pg/g	1,820	1,530	1,950	2,240	1,850	1,590	2,000	1,854
90-PeCB	Congeners	pg/g	117,000 C	111,000 C	109,000 C	126,000 C	113,000 C	108,000 C	121,000 C	115,000 C
91-PeCB	Congeners	pg/g	C88	C88	C88	C88	C88	C88	C88	
92-PeCB	Congeners	pg/g	22,500	21,600	20,900	24,500	21,700	21,000	23,700	22,271
93-PeCB	Congeners	pg/g	14,000 C	80 U	10,100 C	12,700 C	10,300 C	11,600 C	11,000 C	9,969 C
94-PeCB	Congeners	pg/g	100 U	2,350	2,360	2,740	2,490	2,610	2,640	2,184
95-PeCB	Congeners	pg/g	91,200	92,300	92,600	110,000	95,900	88,900	98,500	95,629
96-PeCB	Congeners	pg/g	2,020	2,030	2,010	2,370	1,950	1,910	2,170	2,066
97-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
98-PeCB	Congeners	pg/g	9,040 C	8,070 C	7,200 C	9,500 C	7,920 C	8,210 C	9,160 C	8,443 C

TABLE 1. ANALYTICAL RESULTS OF INPUT SEDIMENT SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SS-01	P2-SS-02	P2-SS-03	P2-SS-03 (Dup)	P2-SS-04	P2-SS-05	P2-SS-06	Average**
99-PeCB	Congeners	pg/g	53,200	55,000	54,200	63,200	54,700	57,300	59,800	56,771
100-PeCB	Congeners	pg/g	C93	C93	C93	C93	C93	C93	C93	
101-PeCB	Congeners	pg/g	C90	C90	C90	C90	C90	C90	C90	
102-PeCB	Congeners	pg/g	C98	C98	C98	C98	C98	C98	C98	
103-PeCB	Congeners	pg/g	3,950	3,900	3,580	4,530	3,690	3,790	4,190	3,947
104-PeCB	Congeners	pg/g	1,270	1,020	1,470 U	1,730	1,080	1,070	1,190	1,261
105-PeCB	Congeners	pg/g	32,000	27,700	27,300	33,600	32,800	29,000	32,600	30,714
106-PeCB	Congeners	pg/g	219 U	170 U	284 U	206 U	218 U	182 U	270 U	221 U
107-PeCB	Congeners	pg/g	3,710 C	176 U	3,200 C	4,240 C	3,520 C	3,370 C	3,550 C	3,109
108-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
109-PeCB	Congeners	pg/g	8,030	7,170	7,020	8,790	8,000	7,810	8,390	7,887
110-PeCB	Congeners	pg/g	123,000 C	122,000 C	105,000 C	121,000 C	112,000 C	120,000 C	127,000 C	118,571 C
111-PeCB	Congeners	pg/g	74 U	64 U	94 U	100 U	179 U	54 U	107 U	96 U
112-PeCB	Congeners	pg/g	3,740	1,160	92 U	99 U	175 U	1,030	1,560	1,122
113-PeCB	Congeners	pg/g	C90	C90	C90	C90	C90	C90	C90	
114-PeCB	Congeners	pg/g	1,820	175 U	1,570	1,980	1,950	192 U	1,700	1,341
115-PeCB	Congeners	pg/g	C110	C110	C110	C110	C110	C110	C110	
116-PeCB	Congeners	pg/g	C85	C85	C85	C85	C85	C85	C85	
117-PeCB	Congeners	pg/g	C85	C85	C85	C85	C85	C85	C85	
118-PeCB	Congeners	pg/g	80,700	71,900	73,900	90,400	84,400	71,300	79,100	78,814
119-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
120-PeCB	Congeners	pg/g	73 U	432	608	748	568	603	525	508
121-PeCB	Congeners	pg/g	72 U	63 U	94 U	100 U	178 U	181	105 U	113
122-PeCB	Congeners	pg/g	1,070	1,250	1,330	218 U	1,650	207 U	1,350	1,011
123-PeCB	Congeners	pg/g	1,500	150 U	1,710 J	2,170	1,980	189 U	1,340	1,291
124-PeCB	Congeners	pg/g	C107	C107	C107	C107	C107	C107	C107	
125-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
126-PeCB	Congeners	pg/g	238 U	180 U	250 U	189 U	1,000	1,160	965	569
127-PeCB	Congeners	pg/g	227 U	176 U	266 U	193 U	204 U	189 U	280 U	219 U
128-HxCB	Congeners	pg/g	16,900 C	16,400 C	15,900 C	19,600 C	16,500 C	17,600 C	17,600 C	17,214
129-HxCB	Congeners	pg/g	392 U	115,000 C	112,000 C	132,000 C	116,000 C	128,000 C	131,000 C	104,913
130-HxCB	Congeners	pg/g	7,090	6,430	7,100	515 U	597 U	7,140	7,460	5,190
131-HxCB	Congeners	pg/g	1,710	499 U	1,220	1,630	1,290	1,560	1,880	1,398
132-HxCB	Congeners	pg/g	39,200	35,800	33,800	40,500	36,300	38,800	40,500	37,843
133-HxCB	Congeners	pg/g	2,330	447 U	2,210	3,040	559 U	263 U	2,680	1,647
134-HxCB	Congeners	pg/g	5,840	6,570	6,830	8,580	6,960	5,980	7,190	6,850
135-HxCB	Congeners	pg/g	45,000 C	42,100 C	42,400 C	49,900 C	45,300 C	46,500 C	48,400 C	45,657 C
136-HxCB	Congeners	pg/g	17,000	16,000	16,500	19,300	17,200	17,900	18,400	17,471
137-HxCB	Congeners	pg/g	4,720	4,210	4,210	419 U	4,510	7,200	7,920	4,741
138-HxCB	Congeners	pg/g	C129	C129	C129	C129	C129	C129	C129	
139-HxCB	Congeners	pg/g	2,320 C	2,090 C	2,260 C	2,460 C	509 U	2,250 C	2,260 C	2,021
140-HxCB	Congeners	pg/g	C139	C139	C139	C139	C139	C139	C139	
141-HxCB	Congeners	pg/g	21,100	18,300	19,300	22,900	19,800	20,100	21,100	20,371
142-HxCB	Congeners	pg/g	433 U	464 U	497 U	513 U	594 U	273 U	564 U	477 U
143-HxCB	Congeners	pg/g	419 U	449 U	448 U	462 U	535 U	264 U	547 U	446 U
144-HxCB	Congeners	pg/g	5,700	5,160	5,250	6,410	5,720	5,870	6,140	5,750
145-HxCB	Congeners	pg/g	213 U	106 U	127 U	155 U	191 U	95 U	153 U	149 U
146-HxCB	Congeners	pg/g	19,900	19,000	18,700	21,200	19,300	20,700	20,600	19,914
147-HxCB	Congeners	pg/g	107,000 C	102,000 C	94,500 C	114,000 C	102,000 C	109,000 C	113,000 C	105,929 C

TABLE 1. ANALYTICAL RESULTS OF INPUT SEDIMENT SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SS-01	P2-SS-02	P2-SS-03	P2-SS-03 (Dup)	P2-SS-04	P2-SS-05	P2-SS-06	Average**
148-HxCB	Congeners	pg/g	631	136 U	729 U	671	262 U	1,000	663	585
149-HxCB	Congeners	pg/g	C147	C147	C147	C147	C147	C147	C147	
150-HxCB	Congeners	pg/g	193 U	873	853	1,060	1,030	1,130	1,010	878
151-HxCB	Congeners	pg/g	C135	C135	C135	C135	C135	C135	C135	
152-HxCB	Congeners	pg/g	205 U	102 U	466 U	395	203 U	91 U	590	293
153-HxCB	Congeners	pg/g	337 U	108,000 C	101,000 C	115,000 C	107,000 C	122,000 C	121,000 C	96,334
154-HxCB	Congeners	pg/g	223 U	3,860	4,120	4,780	5,160	99 U	4,230	3,210
155-HxCB	Congeners	pg/g	5,640	5,610	5,500	7,370	6,290	6,440 J	6,820	6,239
156-HxCB	Congeners	pg/g	11,700 C	10,000 C	10,900 C	12,300 C	11,000 C	11,400 JC	11,500 C	11,257 C
157-HxCB	Congeners	pg/g	C156	C156	C156	C156	C156	C156	C156	
158-HxCB	Congeners	pg/g	11,100	10,300	10,500	12,200	10,900	11,200	11,300	11,071
159-HxCB	Congeners	pg/g	1,730	1,470	1,740	1,940	1,640	2,400	285 U	1,601
160-HxCB	Congeners	pg/g	297 U	319 U	308 U	318 U	1,760	188 U	388 U	511 U
161-HxCB	Congeners	pg/g	311 U	333 U	336 U	346 U	401 U	196 U	406 U	333 U
162-HxCB	Congeners	pg/g	206 U	197 U	1,281 U	1,193 U	1,315 U	320 U	271 U	683 U
163-HxCB	Congeners	pg/g	C129	C129	C129	C129	C129	C129	C129	
164-HxCB	Congeners	pg/g	8,420	7,410	7,770	9,170	8,040	6,270	6,060	7,591
165-HxCB	Congeners	pg/g	333 U	358 U	350 U	361 U	418 U	210 U	435 U	352 U
166-HxCB	Congeners	pg/g	C128	C128	C128	C128	C128	C128	C128	
167-HxCB	Congeners	pg/g	4,050	3,720	4,270 J	4,470	4,390	4,080	4,050	4,147
168-HxCB	Congeners	pg/g	C153	C153	C153	C153	C153	C153	C153	
169-HxCB	Congeners	pg/g	208 UJ	174 U	1,137 U	1,121 U	1,220 U	291 U	278 U	633 U
16-TrCB	Congeners	pg/g	22,300	20,100	15,800	17,800	20,000	16,900	20,600	19,071
170-HpCB	Congeners	pg/g	32,400	30,300	31,500	37,800	33,500	37,600	32,500	33,657
171-HpCB	Congeners	pg/g	10,800 C	11,000 C	9,550 C	10,800 C	10,500 C	12,400 C	11,400 C	10,921 C
172-HpCB	Congeners	pg/g	5,820	5,870	6,170	6,860	6,400	6,830	6,140	6,299
173-HpCB	Congeners	pg/g	C171	C171	C171	C171	C171	C171	C171	
174-HpCB	Congeners	pg/g	36,400	34,700	31,600	40,500	38,900	44,000	38,500	37,800
175-HpCB	Congeners	pg/g	1,600	1,610	1,390	1,680	204 U	1,800	1,800	1,441
176-HpCB	Congeners	pg/g	5,410	4,710	5,030	5,460	5,220	5,750	5,390	5,281
177-HpCB	Congeners	pg/g	21,400	21,600	20,100	24,700	23,300	25,200	23,800	22,871
178-HpCB	Congeners	pg/g	8,140	7,860	8,120	9,380	8,260	9,510	8,240	8,501
179-HpCB	Congeners	pg/g	18,200	17,000	17,600	18,900	17,800	20,200	18,700	18,343
180-HpCB	Congeners	pg/g	72,900 C	72,200 C	70,200 C	85,200 C	75,800 C	90,800 C	76,800 C	77,700 C
181-HpCB	Congeners	pg/g	313 U	241 U	370 U	250 U	455 U	220 U	196 U	292 U
182-HpCB	Congeners	pg/g	167 U	130 U	219 U	151 U	194 U	185 U	192 U	177 U
183-HpCB	Congeners	pg/g	23,900 C	22,200 C	25,100 C	30,000 C	25,800 C	28,000 C	25,900 C	25,843 C
184-HpCB	Congeners	pg/g	129 U	277	224 U	306	283	143 U	271	233
185-HpCB	Congeners	pg/g	C183	C183	C183	C183	C183	C183	C183	
186-HpCB	Congeners	pg/g	132 U	103 U	117 U	122 U	157 U	147 U	152 U	133 U
187-HpCB	Congeners	pg/g	47,200	45,500	42,000	52,700	47,400	59,000	48,800	48,943
188-HpCB	Congeners	pg/g	133 U	239	211 U	295	136 U	142 U	307	209
189-HpCB	Congeners	pg/g	1,080	999	1,160	1,220	1,290	1,250	1,110	1,158
190-HpCB	Congeners	pg/g	7,380	6,690	6,420	7,610	6,820	179 U	160 U	5,037
191-HpCB	Congeners	pg/g	1,440	196 U	1,330	1,590	1,670	1,610	1,540	1,339
192-HpCB	Congeners	pg/g	253 U	195 U	320 U	216 U	393 U	178 U	159 U	245 U
193-HpCB	Congeners	pg/g	C180	C180	C180	C180	C180	C180	C180	
194-OcCB	Congeners	pg/g	19,600	17,800	18,700	21,300	19,500	36,700	21,300	22,129
195-OcCB	Congeners	pg/g	7,870	6,860	7,520	8,880	8,180	12,800	7,940	8,579

TABLE 1. ANALYTICAL RESULTS OF INPUT SEDIMENT SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SS-01	P2-SS-02	P2-SS-03	P2-SS-03 (Dup)	P2-SS-04	P2-SS-05	P2-SS-06	Average**
196-OcCB	Congeners	pg/g	10,900	9,750	9,930	12,000	11,200	20,800	11,300	12,269
197-OcCB	Congeners	pg/g	1,040 C	2,990 C	2,650 C	3,070 C	2,550 C	5,000 C	3,450 C	2,964 C
198-OcCB	Congeners	pg/g	22,100 C	21,200 C	21,600 C	25,500 C	22,500 C	33,500 C	23,700 C	24,300 C
199-OcCB	Congeners	pg/g	C198	C198	C198	C198	C198	C198	C198	
200-OcCB	Congeners	pg/g	C197	C197	C197	C197	C197	C197	C197	
201-OcCB	Congeners	pg/g	3,250	2,780	2,480	3,440	2,900	4,480	3,160	3,213
202-OcCB	Congeners	pg/g	4,630 J	4,240	4,940	5,490	5,030	7,420	5,110	5,266
203-OcCB	Congeners	pg/g	12,500	12,100	12,800	14,500	13,600	16,800	13,300	13,657
204-OcCB	Congeners	pg/g	103 U	239 U	255 U	217 U	243 U	160 U	177 U	199 U
205-OcCB	Congeners	pg/g	161 U	769	1,030 J	220 U	1,050 J	90 U	154 U	496
206-NoCB	Congeners	pg/g	9,670	9,170	10,600	11,800	11,100	17,400	11,500	11,606
207-NoCB	Congeners	pg/g	1,360	1,420	1,400	1,720	1,590	2,750	1,520	1,680
208-NoCB	Congeners	pg/g	3,480	3,500	3,650	191 U	4,450 J	4,610	4,370	3,464
209-DeCB	Congeners	pg/g	8,110	7,820	8,410 J	8,060	7,930	8,180	10,300	8,401
Total of PCB Congeners*			3,252,077	3,114,840	3,109,518	3,644,480	3,417,274	3,371,196	3,551,332	3,351,531
TEQ (PCB)	TEQ	ng/kg	32	27	36	37	126	135	117	73

TABLE 1. ANALYTICAL RESULTS OF INPUT SEDIMENT SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SS-01	P2-SS-02	P2-SS-03	P2-SS-03 (Dup)	P2-SS-04	P2-SS-05	P2-SS-06	Average**
DIOXINS/FURANS										
1,2,3,4,6,7,8-HpCDD	Dioxins-Furans	pg/g	1,170	1,100	1,010	969	1,080	1,020	1,060 J	1,058
1,2,3,4,6,7,8-HpCDF	Dioxins-Furans	pg/g	1,130	1,660	1,010	917	1,200	1,010	1,020 J	1,135
1,2,3,4,7,8,9-HpCDF	Dioxins-Furans	pg/g	36	44 J	32 J	28 J	35 J	36	35	35
1,2,3,4,7,8-HxCDD	Dioxins-Furans	pg/g	12	10 J	11 J	9 J	10 J	11	11	11
1,2,3,4,7,8-HxCDF	Dioxins-Furans	pg/g	276	279	214	201	242	241	237	241
1,2,3,6,7,8-HxCDD	Dioxins-Furans	pg/g	80	70	62 J	62 J	66 J	70	68	68
1,2,3,6,7,8-HxCDF	Dioxins-Furans	pg/g	71	76	55 J	55 J	65 J	71	64	65
2,3,4,6,7,8-HxCDF	Dioxins-Furans	pg/g	49	45 J	41 J	37 J	41 J	40	40	42
1,2,3,7,8,9-HxCDD	Dioxins-Furans	pg/g	39	34 J	33 J	30 J	36 J	33	32	34
1,2,3,7,8,9-HxCDF	Dioxins-Furans	pg/g	13	11 J	10	10 J	11 J	11	10	11
1,2,3,7,8-PeCDD	Dioxins-Furans	pg/g	71.1J Q	6 U	13 J	12 J	8 U	16 J	20	12
1,2,3,7,8-PeCDF	Dioxins-Furans	pg/g	26.6J Q	24 JQ	22 J	20 J	22 JQ	26 J	26	23
2,3,4,7,8-PeCDF	Dioxins-Furans	pg/g	112J JQ	98	90	85	90 JQ	73 J	91 J	88
2,3,7,8-TCDD	Dioxins-Furans	pg/g	2,330 JQ	704	644	589	569	571 J	994 J	914
2,3,7,8-TCDF	Dioxins-Furans	pg/g	58 JQ	2 U	39	40	36	30 J	270 J	68
OCDD	Dioxins-Furans	pg/g	12,600 JE	11,400	10,400	10,100	11,200	10,600 J	11,300 J	11,086
OCDF	Dioxins-Furans	pg/g	1,900	2,490	1,580	1,360	1,950	1,780	1,940 J	1,857
Total HpCDDs	Dioxins-Furans	pg/g	2,580	2,370	2,170	2,110	2,320	2,260 J	2,370	2,311
Total HpCDFs	Dioxins-Furans	pg/g	1,660	2,150	1,440	1,340	1,680	1,530	1,530	1,619
Total HxCDDs	Dioxins-Furans	pg/g	576 J	524	480 J	469	504 J	513 J	551	517
Total HxCDFs	Dioxins-Furans	pg/g	846 J	1,080 J	915 J	847	955 J	939 J	889 J	924
Total PeCDDs	Dioxins-Furans	pg/g	404 J	136 J	140 J	130 J	113 J	138 J	208	181
Total PeCDFs	Dioxins-Furans	pg/g	1,220 J	1,280 J	1,140 J	1,070 J	1,120 J	1,090 J	1,140 J	1,151
Total TCDDs	Dioxins-Furans	pg/g	3,550 J	944	847	766	768	806 J	1,670 J	1,336
Total TCDFs	Dioxins-Furans	pg/g	1,280 J	1,180 J	1,140 J	1,080	1,140	1,170 J	1,520 J	1,216
Total of TCDD/DF Congeners*			26,616	23,554	20,252	19,272	21,750	20,826	23,118	22,198
TEQ (Dioxin)	TEQ	ng/kg	2,543.1	844.7	771.1	709.2	694.1	696.8	1,157.0	1,059
Total TEQ	TEQ	ng/kg	2,575.4	871.2	807.0	746.7	820.1	831.6	1,274.1	1,132
METALS										
Arsenic	Metals	mg/kg	15.3	15.2	14.7	14.1	14.1	14	13.7	14
Barium	Metals	mg/kg	185	189	187	190	174	190	193	187
Cadmium	Metals	mg/kg	7.9	7.6 J	7.9 J	7.8 J	6.9 J	8.3 J	8.5 J	8 J
Chromium	Metals	mg/kg	207	210	219	212	211	204	205	210
Cobalt	Metals	mg/kg	12.7	12.2	12.7	12.4	12.2	12.6	12.7	13
Copper	Metals	mg/kg	262	269	264	274	239	247	260	259
Lead	Metals	mg/kg	395	384	399	388	358	381	379	383
Manganese	Metals	mg/kg	418	446	455	431	453	474	432	444
Mercury	Metals	mg/kg	4.8	5.3	5.6	5.5	5.4	5.4	4.9	5
Nickel	Metals	mg/kg	58.6 J	54.7 J	57.7 J	53.8 J	54.6 J	55.2 J	53.3 J	55 J
Selenium	Metals	mg/kg	3.1 U	3.2 U	3.4 U	3.2 U	3.1 U	3.3 U	3.7	3 U
Silver	Metals	mg/kg	5.6	5.8	6	5.9	5.3	5.9	6.4	6
Zinc	Metals	mg/kg	649 J	651 J	674 J	666 J	605 J	671 J	662 J	654 J

TABLE 1. ANALYTICAL RESULTS OF INPUT SEDIMENT SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SS-01	P2-SS-02	P2-SS-03	P2-SS-03 (Dup)	P2-SS-04	P2-SS-05	P2-SS-06	Average**
PESTICIDES										
4,4'-DDD	Pest	ug/kg	19.6	19	18.4	22.4	20.8	29.7	32.2 J	23
4,4'-DDE	Pest	ug/kg	32 J	31.9 J	26.7 J	34.9 J	29.1 J	47.9	46.6 J	36
4,4'-DDT	Pest	ug/kg	28.2 J	25.2 J	28	34.4 J	27.7 J	29.7 J	87.9 J	37
Dieldrin	Pest	ug/kg	0.53 U	0.54 U	0.55 U	0.54 U	0.53 U	0.54 U	0.54 U	1
SVOCs										
Acenaphthene	SVOC	ug/kg	61.9	69.3	51.1	51.3	72.2	76.8	79.9	66
Acenaphthylene	SVOC	ug/kg	178	221	236	243	283	251	292	243
Anthracene	SVOC	ug/kg	212	221	219	215	262	352	369	264
Benzo(a)anthracene	SVOC	ug/kg	643	697	700	709	790	1140	1110	827
Benzo(a)pyrene	SVOC	ug/kg	675	658	649	648	879	1120	1090 J	817
Benzo(b)fluoranthene	SVOC	ug/kg	701	751	712	700	937	1280	1200	897
Benzo(g,h,i)perylene	SVOC	ug/kg	143	140	193	170	250	484	408	255
Benzo(k)fluoranthene	SVOC	ug/kg	599	694	691	639	754	1110	1050	791
bis(2-Ethylhexyl)phthalate	SVOC	ug/kg	15700	15700	12300	12500	13200	17900	37300 J	17,800
Chrysene	SVOC	ug/kg	526	588	586	613	708	1010	985	717
Dibenzo(a,h)anthracene	SVOC	ug/kg	70.4	68.4	97.9	82.3	115	231	205	124
Di-n-octyl phthalate	SVOC	ug/kg	670	647	674	232	10 U	960	2150 J	763
Fluoranthene	SVOC	ug/kg	1190	1300	1180	1090	1460	1900	1860	1,426
Fluorene	SVOC	ug/kg	123	145	131	58.6	80.1	183	196	131
Indeno(1,2,3-cd)pyrene	SVOC	ug/kg	145	142	182	170	236	440	379	242
Naphthalene	SVOC	ug/kg	40.9	48.5	37.7	33.5	39.1	71.1	58.3	47
Phenanthrene	SVOC	ug/kg	466	523	448	423	656	717	706	563
Pyrene	SVOC	ug/kg	1410	1640	1460	1310	1710	2430	2370	1,761

Notes:

U - Analyte was not detected. The associated value is the estimated detection limit.

J - The analyte is present, but the concentration is below the quantitation limit. The concentration is estimated

UJ - The detection limit is estimated.

C - The isomer coeluted with another of its homologue group. If followed by a number, the number indicates the lowest numbered congener among the coelution set.

"-" The sample was not analyzed for that analyte.

* The total of these analytes includes non-detected values at the detection limit

** Average includes "U", "C", or "J" only if all 6 samples include the modifier

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04 (Dup)	P2-SEM-05	P2-SEM-06	Average
PCBs										
1-MoCB	Congeners	pg/g	0.499 UJ	0.33 UJ	0.586 U	0.557 U	0.454 U	1.25	0.278 UJ	0.56
2-MoCB	Congeners	pg/g	0.463 U	0.324 UJ	0.627 U	0.612 U	0.56 U	2.62	0.724 U	0.85
3-MoCB	Congeners	pg/g	0.402 U	0.297 UJ	0.922 JQ	0.367 UJ	0.652 J	0.432 U	0.25 UJ	0.47
4-DiCB	Congeners	pg/g	1.78 U	2.85 U	1.09 U	1.34 U	0.864 U	1.97 U	1.74 U	1.66 U
5-DiCB	Congeners	pg/g	0.459 U	0.54 U	0.976 U	1.45 U	0.834 U	2 U	2.62 U	1.27 U
6-DiCB	Congeners	pg/g	0.393 U	0.462 U	0.656 U	0.977 U	0.56 U	2.17 U	2.09 U	1.04 U
7-DiCB	Congeners	pg/g	0.363 U	0.426 U	0.611 U	0.91 U	0.522 U	2.06 U	1.98 U	0.98 U
8-DiCB	Congeners	pg/g	0.35 U	0.412 U	0.529 U	0.788 U	1.4	2.55 U	1.8 U	1.12
9-DiCB	Congeners	pg/g	0.441 UJ	0.518 UJ	0.838 U	-	0.715 U	2.98 U	2.86 U	1.39
10-DiCB	Congeners	pg/g	1.14 U	1.71 U	0.677 U	0.856 U	0.555 U	1.35 U	2.34 U	1.23
11-DiCB	Congeners	pg/g	0.424 U	0.498 U	0.748 U	1.11 U	0.639 U	2.52 U	66.1	10.29
12-DiCB	Congeners	pg/g	0.39 U	1.85 J	0.68 U	1.01 U	0.581 U	2.3 U	2.13 U	1.28
13-DiCB	Congeners	pg/g	C12	C12	C12	C12	C12	C12	C12	
14-DiCB	Congeners	pg/g	0.426 U	0.501 U	0.743 U	1.11 U	0.634 U	2.48 U	2.4 U	1.18
15-DiCB	Congeners	pg/g	0.504 U	0.573 U	0.769 U	1.16 U	0.669 U	2.54 U	1.28 U	1.07
16-TrCB	Congeners	pg/g	0.936 U	0.7 U	0.65 U	0.623 U	0.612 UJ	0.464 U	0.619 U	0.66
17-TrCB	Congeners	pg/g	0.907 U	0.678 U	0.778 U	0.746 U	0.733 U	0.547 U	0.803 U	0.74 U
18-TrCB	Congeners	pg/g	0.789 U	0.59 U	2.4 C	0.659 U	0.648 U	0.508 U	0.7 U	0.90
19-TrCB	Congeners	pg/g	1.13 U	0.895 U	0.821 U	0.826 U	0.759 U	0.58 U	0.476 U	0.78 U
20-TrCB	Congeners	pg/g	0.567 U	0.424 U	0.597 U	0.572 U	0.562 U	0.398 U	17.2 C	2.90
21-TrCB	Congeners	pg/g	0.549 U	0.41 U	0.559 U	2.76 CJ	2.49 C	0.376 U	0.579 U	1.10
22-TrCB	Congeners	pg/g	0.623 U	0.465 U	0.613 U	0.587 U	0.577 U	0.423 U	0.594 U	0.55 U
23-TrCB	Congeners	pg/g	0.562 U	0.42 U	0.56 U	0.536 U	0.527 U	0.402 U	0.546 U	0.51 U
24-TrCB	Congeners	pg/g	0.713 U	0.532 U	0.531 U	0.509 U	0.5 U	0.443 U	0.62 U	0.55 U
25-TrCB	Congeners	pg/g	0.466 U	0.348 U	0.602 JQ	0.47 UJ	0.462 U	0.308 UJ	1.68	0.62
26-TrCB	Congeners	pg/g	0.564 U	0.422 U	0.581 U	0.556 UJ	0.547 U	0.417 U	0.599 U	0.53 U
27-TrCB	Congeners	pg/g	0.699 U	0.522 U	0.694 U	0.664 U	0.653 U	0.451 U	0.642 U	0.62 U
28-TrCB	Congeners	pg/g	C20	C20	C20	C20	C20	C20	C20	
29-TrCB	Congeners	pg/g	C26	C26	C26	C26	C26	C20	C20	
30-TrCB	Congeners	pg/g	C18	C18	C18	C18	C18	C18	C18	
31-TrCB	Congeners	pg/g	0.595 U	0.444 U	0.606 U	0.58 U	0.57 U	0.427 U	11.5	2.10
32-TrCB	Congeners	pg/g	0.613 U	0.458 U	1.12	0.542 U	0.533 UJ	0.418 U	2.44	0.87
33-TrCB	Congeners	pg/g	C21	C21	C21	C21	C21	C21	C21	
34-TrCB	Congeners	pg/g	0.689 U	0.515 U	0.638 U	0.611 U	0.601 U	0.463 U	0.707 U	0.60 U
35-TrCB	Congeners	pg/g	0.74 U	0.524 U	0.677 U	0.632 U	0.624 U	0.683 U	0.576 U	0.64 U
36-TrCB	Congeners	pg/g	0.675 U	0.478 U	0.721 U	0.673 U	0.664 U	0.599 U	0.484 U	0.61 U
37-TrCB	Congeners	pg/g	0.78 U	0.529 U	0.693 U	0.625 U	0.648 U	0.749 U	0.281 U	0.62 U
38-TrCB	Congeners	pg/g	0.737 U	0.521 U	0.642 U	0.6 U	0.591 U	0.71 U	0.561 U	0.62 U
39-TrCB	Congeners	pg/g	0.645 U	0.456 U	0.563 U	0.525 U	0.518 U	0.59 U	0.457 U	0.54 U
40-TeCB	Congeners	pg/g	14.1 C	11.4 C	1.09 U	1.22 CJ	1.23 CJ	0.762 U	0.968 U	4.40
41-TeCB	Congeners	pg/g	0.458 U	0.84 U	1.6 U	1.27 U	1.36 U	1.16 U	1.8 U	1.21 U
42-TeCB	Congeners	pg/g	9	6.45	1.18 U	0.937 U	1 U	0.899 U	2.76	3.18
43-TeCB	Congeners	pg/g	1.74	0.776 UJ	1.03 U	0.82 U	0.877 U	0.753 U	0.906 U	0.99
44-TeCB	Congeners	pg/g	34.6 C	27.8 C	1.04 U	0.827 U	0.885 UJ	0.773 U	0.974 U	9.56
45-TeCB	Congeners	pg/g	6 C	0.782 U	1.26 U	1.1 U	1.12 U	0.827 U	0.887 U	1.71
46-TeCB	Congeners	pg/g	0.713 U	0.827 U	1.28 U	1.12 U	1.14 U	0.843 U	0.881 U	0.97 U
47-TeCB	Congeners	pg/g	C44	C44	C44	C44	C44	C44	C44	
48-TeCB	Congeners	pg/g	5.69	0.616 U	1.15 U	0.91 U	0.973 U	0.825 U	1.07 U	1.60
49-TeCB	Congeners	pg/g	20.8 C	15.9 C	2.05 C	2.28 CJ	1.84 CJ	4.17 C	8.28 C	7.90 C
50-TeCB	Congeners	pg/g	0.663 U	0.769 U	1.21 U	1.06 U	1.08 U	0.798 U	0.856 U	0.92 U
51-TeCB	Congeners	pg/g	C45	C45	C45	C45	C45	C45	C45	
52-TeCB	Congeners	pg/g	35.2	0.638 U	1.43 U	1.13 U	1.21 U	0.942 U	22.5	9.01

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04 (Dup)	P2-SEM-05	P2-SEM-06	Average
53-TeCB	Congeners	pg/g	C50	C50	C50	C50	C50	C50	C50	
54-TeCB	Congeners	pg/g	0.691 UJ	1.02 U	0.766 U	0.7 U	0.706 U	0.397 U	0.243 U	0.65 U
55-TeCB	Congeners	pg/g	28.9	0.446 U	1.8 U	0.618 U	0.701 U	0.506 U	1.18 U	4.88
56-TeCB	Congeners	pg/g	0.569 U	0.43 U	1.46 U	0.503 U	0.916 J	0.432 U	1.01 U	0.76
57-TeCB	Congeners	pg/g	0.585 U	0.442 U	1.84 U	0.634 U	0.719 U	0.562 U	1.35 U	0.88 U
58-TeCB	Congeners	pg/g	0.553 UJ	0.418 U	1.76 U	0.605 U	0.686 U	0.519 U	1.23 U	0.82 U
59-TeCB	Congeners	pg/g	2.99 J	2.37 CJ	0.894 U	0.71 U	0.759 U	0.688 UJ	0.958 CJ	1.34
60-TeCB	Congeners	pg/g	0.543 U	0.411 U	1.61 U	1.18	0.628 U	0.488 UJ	1.13 U	0.86
61-TeCB	Congeners	pg/g	0.565 U	0.427 U	5.25 C	4.84 CJ	3.47 CJ	0.487 U	14.6 C	4.23
62-TeCB	Congeners	pg/g	C59	C59	C59	C59	C59	C59	C59	
63-TeCB	Congeners	pg/g	0.617 U	0.467 U	1.88 U	0.646 U	0.733 U	0.568 U	1.33 U	0.89 U
64-TeCB	Congeners	pg/g	13.3	0.468 U	0.86 U	0.682 U	0.73 U	0.595 U	0.798 U	2.49 U
65-TeCB	Congeners	pg/g	C44	C44	C44	C44	C44	C44	C44	
66-TeCB	Congeners	pg/g	0.57 U	0.431 U	3.08	0.605 U	2.07	0.534 U	8.22	2.22
67-TeCB	Congeners	pg/g	1.16	0.952 J	1.46 U	0.502 U	0.57 U	0.431 U	1.02 U	0.87
68-TeCB	Congeners	pg/g	0.494 U	0.373 UJ	1.56 U	0.538 U	0.61 U	0.487 U	1.12 U	0.74 U
69-TeCB	Congeners	pg/g	C49	C49	C49	C49	C49	C49	C49	
70-TeCB	Congeners	pg/g	C61	C61	C61	C61	C61	C61	C61	
71-TeCB	Congeners	pg/g	C40	C40	C40	C40	C40	C40	C40	
72-TeCB	Congeners	pg/g	0.546 U	0.413 U	1.64 U	0.564 U	0.64 U	0.535 U	1.27 U	0.80 U
73-TeCB	Congeners	pg/g	0.248 UJ	0.455 U	0.858 U	0.681 U	0.728 U	0.662 U	0.899 U	0.65 U
74-TeCB	Congeners	pg/g	C61	C61	C61	C61	C61	C61	C61	
75-TeCB	Congeners	pg/g	C59	C59	C59	C59	C59	C59	C59	
76-TeCB	Congeners	pg/g	C61	C61	C61	C61	C61	C61	C61	
77-TeCB	Congeners	pg/g	2.73	0.392	1.53 U	0.551 U	0.62 U	0.476 U	0.589 U	0.98
78-TeCB	Congeners	pg/g	0.561 U	0.424 U	1.75 U	0.603 U	0.684 U	0.499 U	1.24 U	0.82 U
79-TeCB	Congeners	pg/g	0.459 U	0.347 U	1.52 U	0.522 U	0.593 U	0.426 U	1.02 U	0.70 U
80-TeCB	Congeners	pg/g	0.502 U	0.38 U	1.54 U	0.528 U	0.6 U	0.464 U	1.04 U	0.72 U
81-TeCB	Congeners	pg/g	0.518 U	0.38 U	1.77 U	0.569 U	0.651 U	0.483 U	0.576 U	0.71 U
82-PeCB	Congeners	pg/g	3.82	0.75 U	1.36 U	1.16 U	1.5 U	0.768 U	1.91 U	1.61
83-PeCB	Congeners	pg/g	0.652 U	0.906 U	1.61 U	1.38 U	1.78 U	1.08 U	2.94 U	1.48 U
84-PeCB	Congeners	pg/g	8.22	0.679 U	1.31 U	1.12 U	1.45 U	0.812 U	4.68	2.61
85-PeCB	Congeners	pg/g	0.371 U	4.12 C	1 U	0.856 U	1.11 U	0.576 U	2.46 C	1.50
86-PeCB	Congeners	pg/g	23 C	0.548 U	1.03 UJ	3.72 CJ	1.13 UJ	0.591 U	14.8 C	6.40
87-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
88-PeCB	Congeners	pg/g	5.62 C	2.01 C	2.11 U	1.8 U	2.33 U	0.773 U	1.87 U	2.36
89-PeCB	Congeners	pg/g	0.502 UJ	0.698 U	1.39 U	1.19 U	1.54 U	0.865 U	2.02 U	1.17
90-PeCB	Congeners	pg/g	30.3 C	22.2 C	1.11 U	0.948 U	1.23 U	0.642 U	12.6 C	9.86
91-PeCB	Congeners	pg/g	C88	C88	C88	C88	C88	C88	C88	
92-PeCB	Congeners	pg/g	6.68	4.41	1.31 U	1.12 U	1.44 U	0.77 U	2.73	2.64
93-PeCB	Congeners	pg/g	0.467 U	1.97 CJ	1.21 U	1.03 U	1.33 U	0.748 U	1.77 U	1.22
94-PeCB	Congeners	pg/g	0.461 UJ	0.641 U	1.25 U	1.07 U	1.38 U	0.788 U	1.82 U	1.06
95-PeCB	Congeners	pg/g	0.45 U	18.8	1.27 U	1.08 U	1.4 U	0.808 U	16.2	5.72
96-PeCB	Congeners	pg/g	0.483 UJ	0.444 U	1.29 U	1.11 U	1.3 U	1.06 U	1.68 U	1.05 U
97-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
98-PeCB	Congeners	pg/g	2.3 C	1.56 J	1.07 U	0.913 U	1.18 U	0.663 U	1.59 U	1.33
99-PeCB	Congeners	pg/g	13.1	8.99	1.41	1.81	1.16 U	0.609 U	5.29	4.62
100-PeCB	Congeners	pg/g	C93	C93	C93	C93	C93	C93	C93	
101-PeCB	Congeners	pg/g	C90	C90	C90	C90	C90	C90	C90	
102-PeCB	Congeners	pg/g	C98	C98	C98	C98	C98	C98	C98	
103-PeCB	Congeners	pg/g	0.416 U	0.578 UJ	1.2 U	1.02 U	1.32 U	0.751 U	1.8 U	1.01
104-PeCB	Congeners	pg/g	0.344 UJ	0.308 U	0.893 U	0.81 U	0.859 U	0.607 U	0.555 U	0.63
105-PeCB	Congeners	pg/g	8.31	7.71	1.28	0.88 U	1.28 U	0.882 U	1.37	3.10

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04 (Dup)	P2-SEM-05	P2-SEM-06	Average
106-PeCB	Congeners	pg/g	0.603 U	0.477 U	0.911 U	0.899 U	1.23 U	0.866 U	0.666 U	0.81
107-PeCB	Congeners	pg/g	1.02 J	0.494 U	0.908 U	0.896 U	1.23 U	0.817 U	0.69 U	0.87
108-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
109-PeCB	Congeners	pg/g	2.13	0.482 U	0.926 U	0.914 U	1.25 U	0.808 U	0.669 U	1.03
110-PeCB	Congeners	pg/g	33.9 C	25.7 C	0.853 U	0.728 U	0.942 U	0.454 U	1.15 U	9.10
111-PeCB	Congeners	pg/g	0.335 U	0.466 U	0.849 U	0.725 U	0.937 U	0.472 U	1.18 U	0.71
112-PeCB	Congeners	pg/g	0.323 U	0.448 UJ	0.876 U	0.748 U	0.967 U	0.48 U	1.23 U	0.72
113-PeCB	Congeners	pg/g	C90	C90	C90	C90	C90	C90	C90	
114-PeCB	Congeners	pg/g	0.653 U	0.583 J	0.919 U	0.875 U	1.23 U	0.87 U	0.339 U	0.78
115-PeCB	Congeners	pg/g	C110	C110	C110	C110	C110	C110	C110	
116-PeCB	Congeners	pg/g	C85	C85	C85	C85	C85	C85	C85	
117-PeCB	Congeners	pg/g	C85	C85	C85	C85	C85	C85	C85	
118-PeCB	Congeners	pg/g	22.4	17	0.908 U	2.06	1.41	2.6	0.336 U	6.67
119-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
120-PeCB	Congeners	pg/g	0.336 U	0.467 U	0.885 U	0.755 U	0.976 U	0.488 U	1.24 U	0.74
121-PeCB	Congeners	pg/g	0.334 U	0.464 U	0.907 U	0.774 U	1 U	0.539 U	1.31 U	0.76
122-PeCB	Congeners	pg/g	0.668 U	0.528 U	1.1 U	1.08 U	1.48 U	0.936 U	0.768 U	0.94
123-PeCB	Congeners	pg/g	0.651 U	0.491 U	0.842 U	0.844 U	1.24 U	0.78 U	0.331 U	0.74
124-PeCB	Congeners	pg/g	C107	C107	C107	C107	C107	C107	C107	
125-PeCB	Congeners	pg/g	C86	C86	C86	C86	C86	C86	C86	
126-PeCB	Congeners	pg/g	0.801 U	0.582 U	1.02 U	1.02 U	1.33 U	0.92 U	0.392 U	0.87
127-PeCB	Congeners	pg/g	0.683 U	0.541 U	0.922 U	0.91 U	1.25 U	0.764 U	0.699 U	0.82
128-HxCB	Congeners	pg/g	4.24 C	3.52 C	1.29 U	2.01 U	1.85 U	0.704 U	1.34 UJ	2.14
129-HxCB	Congeners	pg/g	26 C	21.6 C	1.28 U	2 U	2.56 J	0.708 U	8.24 C	8.91
130-HxCB	Congeners	pg/g	0.805 U	0.925 U	1.7 U	2.65 U	2.44 U	0.964 U	1.88 U	1.62
131-HxCB	Congeners	pg/g	0.746 U	0.857 U	1.72 U	2.7 U	2.48 U	1.05 U	1.83 U	1.63
132-HxCB	Congeners	pg/g	0.719 U	0.827 U	1.55 U	2.41 U	2.22 U	0.933 U	2.88	1.65
133-HxCB	Congeners	pg/g	0.702 U	0.807 U	1.68 U	2.63 U	2.42 U	0.988 U	1.77 U	1.57
134-HxCB	Congeners	pg/g	1.7	1.48	1.76 U	2.74 U	2.53 U	1.18 U	1.96 U	1.91
135-HxCB	Congeners	pg/g	9.8	0.784 U	2.32 U	2.35 U	3.36 U	0.912 U	2.71 C	3.18
136-HxCB	Congeners	pg/g	3.23	0.583 U	1.86 U	1.88 U	2.69 U	0.839 U	1.94	1.86
137-HxCB	Congeners	pg/g	1.63	1.01 J	1.44 U	2.24 U	2.06 U	0.823 U	1.58 U	1.54
138-HxCB	Congeners	pg/g	C129	C129	C129	C129	C129	C129	C129	
139-HxCB	Congeners	pg/g	0.618 U	0.711 U	1.41 U	2.21 U	2.03 U	0.838 U	1.56 U	1.34
140-HxCB	Congeners	pg/g	C139	C139	C139	C139	C139	C139	C139	
141-HxCB	Congeners	pg/g	4.74	3.76	1.4 U	2.19 U	2.01 U	0.807 U	1.47 U	2.34
142-HxCB	Congeners	pg/g	0.74 U	0.851 U	1.63 U	2.54 U	2.34 U	1.03 U	1.81 U	1.56
143-HxCB	Congeners	pg/g	1.35	0.74 U	1.54 U	2.41 U	2.22 U	0.899 U	1.65 U	1.54
144-HxCB	Congeners	pg/g	0.665 U	0.795 U	2.25 U	2.28 U	3.26 U	0.927 U	1.58 U	1.68
145-HxCB	Congeners	pg/g	0.472 U	0.564 U	1.66 U	1.68 U	2.41 U	0.796 U	1.27 U	1.26
146-HxCB	Congeners	pg/g	0.572 U	0.658 U	1.33 U	2.08 U	1.91 U	0.77 UJ	1.55	1.27
147-HxCB	Congeners	pg/g	21.6 C	16.3 C	2.82 C	2.19 C	1.96 U	0.835 U	6.76 C	7.50
148-HxCB	Congeners	pg/g	0.653 U	0.78 U	2.26 U	2.29 U	3.28 U	1.01 U	1.68 U	1.71
149-HxCB	Congeners	pg/g	C147	C147	C147	C147	C147	C147	C147	
150-HxCB	Congeners	pg/g	0.511 U	0.611 U	1.65 U	1.67 U	2.4 U	0.734 U	1.18 U	1.25
151-HxCB	Congeners	pg/g	C135	C135	C135	C135	C135	C135	C135	
152-HxCB	Congeners	pg/g	0.53 U	0.634 U	1.86 U	1.88 U	2.7 U	0.846 U	1.34 U	1.40
153-HxCB	Congeners	pg/g	22.8 C	17.5 C	3.67 C	2.36 C	2.47 C	0.692 U	7.34 C	8.12
154-HxCB	Congeners	pg/g	0.55 UJ	0.794 J	1.79 U	1.81 U	2.6 U	0.785 U	1.29 U	1.37
155-HxCB	Congeners	pg/g	0.372 U	0.399 UJ	0.899 U	0.918 U	1.29 U	0.396 U	0.369 U	0.66
156-HxCB	Congeners	pg/g	3.01 C	2.29 C	2.06 U	1.67 U	1.61 U	0.976 U	0.53 UJ	1.74
157-HxCB	Congeners	pg/g	C156	C156	C156	C156	C156	C156	C156	
158-HxCB	Congeners	pg/g	0.478 U	2.18	1.03 U	1.61 U	1.48 U	0.541 U	1.05 U	1.20

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04 (Dup)	P2-SEM-05	P2-SEM-06	Average
159-HxCB	Congeners	pg/g	0.914 U	0.611 U	2.07 U	1.65 U	1.59 U	0.901 U	0.906 U	1.23
160-HxCB	Congeners	pg/g	0.534 U	0.614 U	1.11 U	1.73 U	1.59 U	0.623 U	1.13 U	1.05
161-HxCB	Congeners	pg/g	0.516 U	0.593 U	1.22 U	1.9 U	1.75 U	0.67 U	1.28 U	1.13
162-HxCB	Congeners	pg/g	0.853 U	0.57 U	1.85 U	1.48 U	1.43 U	0.818 U	0.829 U	1.12
163-HxCB	Congeners	pg/g	C129	C129	C129	C129	C129	C129	C129	
164-HxCB	Congeners	pg/g	1.91	0.597 U	1.07 U	1.67 U	1.54 U	0.589 U	1.13 U	1.22
165-HxCB	Congeners	pg/g	0.567 U	0.652 U	1.23 U	1.93 U	1.77 U	0.707 U	1.31 U	1.17
166-HxCB	Congeners	pg/g	C128	C128	C128	C128	C128	C128	C128	
167-HxCB	Congeners	pg/g	1.17	0.916 J	1.68 U	1.32 U	1.25 U	0.778 U	0.396 U	1.07
168-HxCB	Congeners	pg/g	C153	C153	C153	C153	C153	C153	C153	
169-HxCB	Congeners	pg/g	0.937 U	0.672 U	1.82 U	1.45 U	1.43 U	0.879 U	0.412 U	1.09
170-HpCB	Congeners	pg/g	9.08	6.38	1.49 U	1.54 U	2.41 U	0.936 U	2.55	3.48
171-HpCB	Congeners	pg/g	0.695 U	2.64 C	1.45 U	1.51 U	2.36 U	0.965 U	1.66 U	1.61
172-HpCB	Congeners	pg/g	0.674 U	2.31	1.51 U	1.57 U	2.46 U	0.932 U	1.71 U	1.60
173-HpCB	Congeners	pg/g	C171	C171	C171	C171	C171	C171	C171	
174-HpCB	Congeners	pg/g	8.93	7.33	1.4 U	1.45 U	2.27 U	0.881 U	2.19	3.49
175-HpCB	Congeners	pg/g	0.77 U	0.784 U	2.03 U	1.53 U	1.87 U	0.867 U	1.74 U	1.37 U
176-HpCB	Congeners	pg/g	0.605 U	1	1.64 U	1.24 U	1.51 U	0.748 U	1.42 U	1.17
177-HpCB	Congeners	pg/g	6.25	0.73 U	1.63 U	1.7 U	2.65 U	0.967 U	1.64 U	2.22
178-HpCB	Congeners	pg/g	0.786 U	2.37	2.13 U	1.61 U	1.96 U	0.921 U	1.81 U	1.66
179-HpCB	Congeners	pg/g	3.66	0.585 U	1.64 U	1.24 U	1.51 U	0.803 U	1.42 U	1.55
180-HpCB	Congeners	pg/g	19.2 C	13.7 C	1.9 JQ	1.2 U	1.87 U	1.79 J	4.02 C	6.24
181-HpCB	Congeners	pg/g	0.664 U	0.692 U	1.34 U	1.39 U	2.17 U	0.84 U	1.46 U	1.22 U
182-HpCB	Congeners	pg/g	0.712 U	0.725 U	1.94 U	1.47 U	1.79 U	0.83 U	1.58 U	1.29 U
183-HpCB	Congeners	pg/g	5.34 C	0.643 U	1.42 U	1.48 U	2.31 U	0.858 U	1.48 U	1.93
184-HpCB	Congeners	pg/g	0.499 U	0.508 U	1.46 U	1.1 U	1.35 U	0.653 U	1.26 U	0.98 U
185-HpCB	Congeners	pg/g	C183	C183	C183	C183	C183	C183	C183	
186-HpCB	Congeners	pg/g	0.576 U	0.587 U	1.57 U	1.19 U	1.45 U	0.685 U	1.33 U	1.06 U
187-HpCB	Congeners	pg/g	10.6	8.54	1.79 U	1.35 U	1.65 U	0.767 U	2.61	3.90
188-HpCB	Congeners	pg/g	0.508 U	0.515 U	1.34 U	1.03 U	1.2 U	0.592 U	0.583 U	0.82 U
189-HpCB	Congeners	pg/g	0.392 U	0.729 U	1.11 U	1.33 U	1.84 U	0.774 U	0.436 U	0.94 U
190-HpCB	Congeners	pg/g	2.23	0.534 U	1.12 U	1.16 U	1.81 U	0.703 U	1.2 U	1.25
191-HpCB	Congeners	pg/g	0.516 U	0.537 U	1.12 U	1.17 U	1.82 U	0.72 U	1.25 U	1.02 U
192-HpCB	Congeners	pg/g	0.547 U	0.57 U	1.12 U	1.16 U	1.82 U	0.71 U	1.2 U	1.02 U
193-HpCB	Congeners	pg/g	C180	C180	C180	C180	C180	C180	C180	
194-OcCB	Congeners	pg/g	0.575 U	4.14	2.07 U	1.74 U	2.51 U	1.19 U	1.73 U	1.99 U
195-OcCB	Congeners	pg/g	0.623 U	1.02 U	2.42 U	2.03 U	2.94 U	1.28 U	1.91 U	1.75 U
196-OcCB	Congeners	pg/g	2.29	0.787 U	2.19 U	2.28 U	1.99 U	1.1 U	1.67 U	1.76
197-OcCB	Congeners	pg/g	0.619 U	0.583 U	3.55 U	3.7 U	3.23 U	0.806 U	1.27 U	1.97 U
198-OcCB	Congeners	pg/g	5.77 C	0.788 U	2.12 U	2.21 U	1.93 U	1.07 U	2.51 C	2.34
199-OcCB	Congeners	pg/g	C198	C198	C198	C198	C198	C198	C198	
200-OcCB	Congeners	pg/g	C197	C197	C197	C197	C197	C197	C197	
201-OcCB	Congeners	pg/g	0.645 UJ	0.607 U	1.75 U	1.82 U	1.59 U	0.887 U	1.35 U	1.24 U
202-OcCB	Congeners	pg/g	0.641 U	0.659 U	1.52 U	1.65 U	1.41 U	0.766 U	0.61 U	1.04 U
203-OcCB	Congeners	pg/g	3.09	0.723 U	1.9 U	1.98 U	1.73 U	0.93 U	1.45 U	1.69
204-OcCB	Congeners	pg/g	0.652 U	0.614 U	1.79 U	1.87 U	1.63 U	0.89 U	1.38 U	1.26 U
205-OcCB	Congeners	pg/g	0.498 U	0.764 U	1.76 U	1.42 U	2.1 U	0.986 U	0.671 U	1.17 U
206-NoCB	Congeners	pg/g	3.45	2.76	2.13 U	2.51 U	2.62 U	1.23 U	0.803 U	2.21
207-NoCB	Congeners	pg/g	0.789 U	0.69 U	1.89 U	2.28 U	2.25 U	1.08 U	1.52 U	1.50 U
208-NoCB	Congeners	pg/g	1.57	0.738 U	1.73 U	2.15 U	2.01 U	0.987 U	0.709 U	1.41
209-DeCB	Congeners	pg/g	2.49	1.29 U	2.23 U	1.74 U	2.61 U	0.945 U	1.02 U	1.76
Total of PCB Congeners			591.98100	381.66800	229.68400	218.57100	238.73800	147.79300	421.55000	318.56929

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04 (Dup)	P2-SEM-05	P2-SEM-06	Average
TEQ (PCB)	TEQ	ng/kg	0.050	0.037	0.061	0.059	0.075	0.051	0.022	0.051
DIOXINS-FURANS										
1,2,3,4,6,7,8-HpCDD	Dioxins-Furans	pg/g	1.31 JA	2.63 U	0.548 JA	0.425 U	0.394 U	0.474 J	0.31 J	0.870
1,2,3,4,6,7,8-HpCDF	Dioxins-Furans	pg/g	0.72 JA	1.38 U	0.38 U	0.425 U	0.252 JA	0.292 J	0.425 U	0.553
1,2,3,4,7,8,9-HpCDF	Dioxins-Furans	pg/g	0.887 U	1.72 U	0.454 U	0.425 U	0.394 U	0.496 U	0.425 U	0.686
1,2,3,4,7,8-HxCDD	Dioxins-Furans	pg/g	0.469 U	0.434 U	0.385 U	0.425 U	0.394 U	0.421 U	0.425 U	0.422
1,2,3,4,7,8-HxCDF	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	0.108 J	0.425 U	0.373
1,2,3,6,7,8-HxCDD	Dioxins-Furans	pg/g	0.486 U	0.434 U	0.399 U	0.425 U	0.394 U	0.421 U	0.425 U	0.426
1,2,3,6,7,8-HxCDF	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	0.121 J	0.425 U	0.375
1,2,3,7,8,9-HxCDD	Dioxins-Furans	pg/g	0.474 U	0.434 U	0.388 U	0.425 U	0.394 U	0.421 U	0.425 U	0.423
1,2,3,7,8,9-HxCDF	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	0.421 U	0.425 U	0.418
1,2,3,7,8-PeCDD	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	0.421 U	0.43 U	0.418
1,2,3,7,8-PeCDF	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	0.123 J	0.425 U	0.375
2,3,4,6,7,8-HxCDF	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	0.421 U	0.425 U	0.418
2,3,4,7,8-PeCDF	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	0.174 J	0.425 U	0.382
2,3,7,8-TCDD	Dioxins-Furans	pg/g	0.833 U	0.625 U	0.72 U	0.338 U	0.287 U	0.461 U	0.248 U	0.502
2,3,7,8-TCDF	Dioxins-Furans	pg/g	0.502 U	0.336 U	0.369 U	0.184 U	0.15 A	0.322 U	0.189 U	0.293
OCDD	Dioxins-Furans	pg/g	8.74 A	1.13 U	5.97 A	0.851 U	0.788 U	2.08	0.851 U	2.916
OCDF	Dioxins-Furans	pg/g	1.31 U	0.932 U	1.11 U	0.851 U	0.788 U	1.24 U	0.851 U	1.012
Total HpCDDs	Dioxins-Furans	pg/g	2.84	2.63 U	1.11	0.237	0.394 U	0.958	0.31	1.211
Total HpCDFs	Dioxins-Furans	pg/g	0.72	1.72 U	0.454 U	0.425 U	0.252	0.292	0.425 U	0.613
Total HxCDDs	Dioxins-Furans	pg/g	0.486 U	0.434 U	0.399 U	0.425 U	0.394 U	0.722	0.425 U	0.469
Total HxCDFs	Dioxins-Furans	pg/g	0.522	0.434 U	0.38 U	0.425 U	0.394 U	0.686	0.425 U	0.467
Total PeCDDs	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	0.951 J	0.43 U	0.494
Total PeCDFs	Dioxins-Furans	pg/g	0.444 U	0.434 U	0.38 U	0.425 U	0.394 U	1.13 J	0.425 U	0.519
Total TCDDs	Dioxins-Furans	pg/g	0.833 U	0.625 U	0.72 U	0.338 U	0.287 U	0.494	0.248 U	0.506
Total TCDFs	Dioxins-Furans	pg/g	0.502 U	0.336 U	0.369 U	0.184 U	0.15	1.83	0.189 U	0.509
Total of D/F Congener Categories*			16.84	9.11	11.27	4.59	4.24	10.38	4.58	8.72
TEQ (Dioxin)	TEQ	ng/kg	0.972	0.998	0.818	0.663	0.608	0.690	0.622	0.767
Total TEQ (D/F+PCBs)	TEQ	ng/kg	1.021	1.034	0.879	0.722	0.683	0.741	0.644	0.818
METALS										
Arsenic	Metals	mg/kg	2.3 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.2 U	2.1 U
Barium	Metals	mg/kg	159	166	235	222	216	20 U	22 U	148.6
Cadmium	Metals	mg/kg	0.66	0.58	0.83	0.8	0.77	0.51 U	0.55 U	0.7
Chromium	Metals	mg/kg	101	103	125	116	114	7.2	11.6	82.5
Cobalt	Metals	mg/kg	7.6	7.6	10.7	10.2	9.3	5.1 U	5.5 U	8.0
Copper	Metals	mg/kg	93.5	101	150	141	138	7.3	12.9	92.0
Lead	Metals	mg/kg	25.2	18	45.1	41.6	40.2	8.9	11.3	27.2
Manganese	Metals	mg/kg	242	237	315	300	290	14.7	27.9	203.8
Mercury	Metals	mg/kg	0.035 U	0.034 U	0.033 U	0.033 U	0.033 U	0.031 U	0.032 U	0.0 U
Nickel	Metals	mg/kg	29.7	27.7	38.2	36.1	34	4.1 U	4.4 U	24.9
Selenium	Metals	mg/kg	2.3 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.2 U	2.1 U
Silver	Metals	mg/kg	1.1 U	1 U	1.1 U	1 U	0.99 U	1 U	1.1 U	1.0 U
Zinc	Metals	mg/kg	88.1	79.6	220	203	200	14.1	20.9	118.0
PESTICIDES										
4,4'-DDD	Pest	ug/kg	0.36 U	0.35 U	0.33 U	0.32 U	0.32 U	0.34 U	0.33 UJ	0.336 U
4,4'-DDE	Pest	ug/kg	0.37 U	0.36 U	0.34 U	0.33 U	0.34 U	0.35 U	0.34 U	0.347 U
4,4'-DDT	Pest	ug/kg	0.45 U	0.44 U	0.42 U	0.41 U	0.41 U	0.43 U	0.42 U	0.426 U
Dieldrin	Pest	ug/kg	0.37 U	0.37 U	0.35 U	0.34 U	0.34 U	0.36 U	0.35 U	0.354 U

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04 (Dup)	P2-SEM-05	P2-SEM-06	Average
SVOCs										
Acenaphthene	SVOC	ug/kg	0.6 U	0.59 U	0.56 U	0.56 U	0.56 U	0.57 U	0.57 U	0.57 U
Acenaphthylene	SVOC	ug/kg	0.37 U	0.37 U	0.35 U	0.35 U	0.35 U	0.36 U	0.36 U	0.36 U
Anthracene	SVOC	ug/kg	0.26 U	0.26 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	0.25 U
Benzo(a)anthracene	SVOC	ug/kg	0.23 U	0.22 U	0.21 U	0.21 U	0.21 U	0.22 U	0.22 U	0.22 U
Benzo(a)pyrene	SVOC	ug/kg	0.55 U	0.54 U	0.51 U	0.51 U	0.51 U	0.52 U	0.52 U	0.52 U
Benzo(b)fluoranthene	SVOC	ug/kg	1.4 UJ	1.4 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.33 U
Benzo(g,h,i)perylene	SVOC	ug/kg	0.62 U	0.61 U	0.58 U	0.58 U	0.58 U	0.59 U	0.59 U	0.59 U
Benzo(k)fluoranthene	SVOC	ug/kg	0.62 U	0.61 U	0.58 U	0.57 U	0.57 U	0.59 U	0.59 U	0.59 U
bis(2-Ethylhexyl)phthalate	SVOC	ug/kg	24 U	24 U	22 U	22 U	22 U	23 U	23 U	22.86 U
Chrysene	SVOC	ug/kg	0.41 U	0.41 U	0.38 U	0.38 U	0.38 U	0.39 U	0.39 U	0.39 U
Dibenzo(a,h)anthracene	SVOC	ug/kg	0.48 U	0.47 U	0.45 U	0.44 U	0.44 U	0.46 U	0.46 U	0.46 U
Di-n-octyl phthalate	SVOC	ug/kg	7.3 U	7.2 U	6.8 U	6.8 U	6.8 U	7 U	7 U	6.99 U
Fluoranthene	SVOC	ug/kg	0.27 U	0.26 U	0.25 U	0.25 U	0.25 U	0.26 U	0.26 U	0.26 U
Fluorene	SVOC	ug/kg	0.68 U	0.67 U	0.63 U	0.63 U	0.63 U	0.65 U	0.65 U	0.65 U
Indeno(1,2,3-cd)pyrene	SVOC	ug/kg	0.57 U	0.56 U	0.53 U	0.53 U	0.53 U	0.55 U	0.55 U	0.55 U
Naphthalene	SVOC	ug/kg	0.44 U	0.43 U	0.41 U	0.41 U	0.41 U	0.42 U	0.42 U	0.42 U
Phenanthrene	SVOC	ug/kg	0.39 U	0.39 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U
Pyrene	SVOC	ug/kg	0.29 U	0.29 U	0.27 U	0.27 U	0.27 U	0.28 U	0.28 U	0.28 U
Arsenic	SPLP/Metals	mg/l	0.008 U	-	0.008 U	-	-	-	0.008 U	0.00800 U
Barium	SPLP/Metals	mg/l	1 U	-	1 U	-	-	-	1 U	1.00000 U
Cadmium	SPLP/Metals	mg/l	0.004 U	-	0.004 U	-	-	-	0.004 U	0.00400 U
Chromium	SPLP/Metals	mg/l	0.01 U	-	0.01 U	-	-	-	0.01 U	0.01000 U
Cobalt	SPLP/Metals	mg/l	0.05 U	-	0.05 U	-	-	-	0.05 U	0.05000 U
Copper	SPLP/Metals	mg/l	0.025 U	-	0.025 U	-	-	-	0.025 U	0.02500 U
Lead	SPLP/Metals	mg/l	0.01 U	-	0.017	-	-	-	0.032	0.01967
Manganese	SPLP/Metals	mg/l	0.084	-	0.021	-	-	-	0.023	0.04267
Mercury	SPLP/Metals	mg/l	0.0002 U	-	0.00029	-	-	-	0.0002 U	0.00023
Nickel	SPLP/Metals	mg/l	0.043	-	0.04 U	-	-	-	0.04 U	0.04100
Selenium	SPLP/Metals	mg/l	0.05 U	-	0.05 U	-	-	-	0.05 U	0.05000 U
Silver	SPLP/Metals	mg/l	0.01 U	-	0.01 U	-	-	-	0.01 U	0.01000 U
Zinc	SPLP/Metals	mg/l	0.13	-	0.1 U	-	-	-	0.12	0.11667
4,4'-DDD	SPLP/Pest	mg/l	0.000017 U	-	0.000017 U	-	-	-	0.000017 U	0.00002 U
4,4'-DDE	SPLP/Pest	mg/l	0.0000041 U	-	0.0000041 U	-	-	-	0.0000041 U	0.00000 U
4,4'-DDT	SPLP/Pest	mg/l	0.000018 U	-	0.000018 U	-	-	-	0.000018 U	0.00002 U
Dieldrin	SPLP/Pest	mg/l	0.000013 U	-	0.000013 U	-	-	-	0.000013 U	0.00001 U
Benzo(a)anthracene	SPLP/SVOC	mg/l	0.000019 U	-	0.000019 U	-	-	-	0.000019 U	0.00002 U
Benzo(a)pyrene	SPLP/SVOC	mg/l	0.0000039 U	-	0.0000039 U	-	-	-	0.0000039 U	0.00000 U
Benzo(b)fluoranthene	SPLP/SVOC	mg/l	0.000017 U	-	0.000017 U	-	-	-	0.000017 U	0.00002 U
Benzo(k)fluoranthene	SPLP/SVOC	mg/l	0.000021 U	-	0.000021 U	-	-	-	0.000021 U	0.00002 U
bis(2-Ethylhexyl)phthalate	SPLP/SVOC	mg/l	0.00013 U	-	0.00013 U	-	-	-	0.00013 U	0.00013 U
Chrysene	SPLP/SVOC	mg/l	0.0000093 U	-	0.0000093 U	-	-	-	0.0000093 U	0.00001 U
Indeno(1,2,3-cd)pyrene	SPLP/SVOC	mg/l	0.0000085 U	-	0.0000085 U	-	-	-	0.0000085 U	0.00001 U

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04 (Dup)	P2-SEM-05	P2-SEM-06	Average
Arsenic	TCLP/Metals	mg/l	0.5 U	0.5 U	0.5 U	0.5 U	-	0.5 U	0.5 U	0.5 U
Barium	TCLP/Metals	mg/l	1 U	1 U	1 U	1 U	-	1	1 U	1.0
Cadmium	TCLP/Metals	mg/l	0.0092	0.005 U	0.005 U	0.005 U	-	0.005 U	0.005 U	0.0
Chromium	TCLP/Metals	mg/l	0.01	0.01 U	0.01 U	0.01 U	-	0.014	0.011	0.0
Cobalt	TCLP/Metals	mg/l	0.05 U	0.05 U	0.05 U	0.05 U	-	0.05 U	0.05 U	0.1 U
Copper	TCLP/Metals	mg/l	0.15	0.025 U	0.025	0.025 U	-	0.034	0.026	0.0
Lead	TCLP/Metals	mg/l	0.5 U	0.5 U	0.5 U	0.5 U	-	0.5 U	0.5 U	0.5 U
Manganese	TCLP/Metals	mg/l	0.21	0.071	0.037	0.032	-	0.037	0.034	0.1
Mercury	TCLP/Metals	mg/l	0.0002 U	0.0002 U	0.0002 U	0.0002 U	-	0.0002 U	0.0002 U	0.0 U
Nickel	TCLP/Metals	mg/l	0.12	0.04	0.04 U	0.04 U	-	0.04 U	0.04 U	0.1
Selenium	TCLP/Metals	mg/l	0.5 U	0.5 U	0.5 U	0.5 U	-	0.5 U	0.5 U	0.5 U
Silver	TCLP/Metals	mg/l	0.01 U	0.01 U	0.01 U	0.01 U	-	0.01 U	0.01 U	0.0 U
Zinc	TCLP/Metals	mg/l	0.7	0.31	0.16	0.13	-	0.22	0.17	0.3
4,4'-DDD	TCLP/Pest	mg/l	0.00017 U	0.00017 U	0.000017 UJ	0.00017 U	-	0.00017 U	0.00017 U	0.000145 U
4,4'-DDE	TCLP/Pest	mg/l	0.000041 U	0.000041 U	0.000041 U	0.000041 U	-	0.000041 U	0.000041 U	0.000041 U
4,4'-DDT	TCLP/Pest	mg/l	0.00018 U	0.00018 U	0.00018 U	0.00018 U	-	0.00018 U	0.00018 U	0.000180 U
Dieldrin	TCLP/Pest	mg/l	0.000013 U	0.00013 U	0.00013 U	0.00013 U	-	0.00013 U	0.00013 U	0.000111 U
Acenaphthene	TCLP/SVOC	mg/l	0.000054 U	0.000054 U	0.000054 U	0.000054 U	-	0.000054 U	0.000054 U	0.0000540 U
Acenaphthylene	TCLP/SVOC	mg/l	0.000021 U	0.000021 U	0.000021 U	0.000021 U	-	0.000021 U	0.000021 U	0.0000210 U
Anthracene	TCLP/SVOC	mg/l	0.000029 U	0.000029 U	0.000029 U	0.000029 U	-	0.000029 U	0.000029 U	0.0000290 U
Benzo(a)anthracene	TCLP/SVOC	mg/l	0.00019 U	0.00019 U	0.00019 U	0.00019 U	-	0.00019 U	0.00019 U	0.0001900 U
Benzo(a)pyrene	TCLP/SVOC	mg/l	0.000039 U	0.000039 U	0.000039 U	0.000039 U	-	0.000039 U	0.000039 U	0.0000390 U
Benzo(b)fluoranthene	TCLP/SVOC	mg/l	0.00017 U	0.00017 U	0.00017 U	0.00017 U	-	0.00017 U	0.00017 U	0.0001700 U
Benzo(g,h,i)perylene	TCLP/SVOC	mg/l	0.000088 U	0.000088 U	0.000088 U	0.000088 U	-	0.000088 U	0.000088 U	0.0000880 U
Benzo(k)fluoranthene	TCLP/SVOC	mg/l	0.00021 U	0.00021 U	0.00021 U	0.00021 U	-	0.00021 U	0.00021 U	0.0002100 U
bis(2-Ethylhexyl)phthalate	TCLP/SVOC	mg/l	0.0013 U	0.0013 U	0.0013 U	0.0013 U	-	0.0013 U	0.0013 U	0.0013000 U
Chrysene	TCLP/SVOC	mg/l	0.000093 U	0.000093 U	0.000093 U	0.000093 U	-	0.000093 U	0.000093 U	0.0000930 U
Dibenzo(a,h)anthracene	TCLP/SVOC	mg/l	0.00012 U	0.00012 U	0.00012 U	0.00012 U	-	0.00012 U	0.00012 U	0.0001200 U
Di-n-octyl phthalate	TCLP/SVOC	mg/l	0.002 U	0.002 U	0.002 U	0.002 U	-	0.002 U	0.002 U	0.0020000 U
Fluoranthene	TCLP/SVOC	mg/l	0.0002 U	0.0002 U	0.0002 U	0.0002 U	-	0.0002 U	0.0002 U	0.0002000 U
Fluorene	TCLP/SVOC	mg/l	0.000077 U	0.000077 U	0.000077 U	0.000077 U	-	0.000077 U	0.000077 U	0.0000770 U
Indeno(1,2,3-cd)pyrene	TCLP/SVOC	mg/l	0.000085 U	0.000085 U	0.000085 U	0.000085 U	-	0.000085 U	0.000085 U	0.0000850 U
Naphthalene	TCLP/SVOC	mg/l	0.000082 U	0.000082 U	0.000082 U	0.000082 U	-	0.000082 U	0.000082 U	0.0000820 U
Phenanthrene	TCLP/SVOC	mg/l	0.000099 U	0.000099 U	0.000099 U	0.000099 U	-	0.000099 U	0.000099 U	0.0000990 U
Pyrene	TCLP/SVOC	mg/l	0.00011 U	0.00011 U	0.00011 U	0.00011 U	-	0.00011 U	0.00011 U	0.0001100 U

Notes:
U - Analyte was not detected. The associated value is the estimated detection limit.
J - The analyte is present, but the concentration is below the quantitation limit. The concentration is estimated
UJ - The detection limit is estimated.
C - The isomer coeluted with another of its homologue group. If followed by a number, the number indicates the lowest numbered congener among the coelution set.
"-" The sample was not analyzed for that analyte.
* The total of these analytes includes non-detected values at the detection limit

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES LEACHING TESTS
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04	P2-SEM-05	P2-SEM-06	Average
SPLP METALS										
Arsenic	SPLP/Metals	mg/l	0.008 U	-	0.008 U	-	-	-	0.008 U	0.00800 U
Barium	SPLP/Metals	mg/l	1 U	-	1 U	-	-	-	1 U	1.00000 U
Cadmium	SPLP/Metals	mg/l	0.004 U	-	0.004 U	-	-	-	0.004 U	0.00400 U
Chromium	SPLP/Metals	mg/l	0.01 U	-	0.01 U	-	-	-	0.01 U	0.01000 U
Cobalt	SPLP/Metals	mg/l	0.05 U	-	0.05 U	-	-	-	0.05 U	0.05000 U
Copper	SPLP/Metals	mg/l	0.025 U	-	0.025 U	-	-	-	0.025 U	0.02500 U
Lead	SPLP/Metals	mg/l	0.01 U	-	0.017	-	-	-	0.032	0.01967
Manganese	SPLP/Metals	mg/l	0.084	-	0.021	-	-	-	0.023	0.04267
Mercury	SPLP/Metals	mg/l	0.0002 U	-	0.00029	-	-	-	0.0002 U	0.00023
Nickel	SPLP/Metals	mg/l	0.043	-	0.04 U	-	-	-	0.04 U	0.04100
Selenium	SPLP/Metals	mg/l	0.05 U	-	0.05 U	-	-	-	0.05 U	0.05000 U
Silver	SPLP/Metals	mg/l	0.01 U	-	0.01 U	-	-	-	0.01 U	0.01000 U
Zinc	SPLP/Metals	mg/l	0.13	-	0.1 U	-	-	-	0.12	0.11667
SPLP PESTICIDES										
4,4'-DDD	SPLP/Pest	mg/l	0.000017 U	-	0.000017 U	-	-	-	0.000017 U	0.00002 U
4,4'-DDE	SPLP/Pest	mg/l	0.0000041 U	-	0.0000041 U	-	-	-	0.0000041 U	0.00000 U
4,4'-DDT	SPLP/Pest	mg/l	0.000018 U	-	0.000018 U	-	-	-	0.000018 U	0.00002 U
Dieldrin	SPLP/Pest	mg/l	0.000013 U	-	0.000013 U	-	-	-	0.000013 U	0.00001 U
SPLP SVOCs										
Benzo(a)anthracene	SPLP/SVOC	mg/l	0.000019 U	-	0.000019 U	-	-	-	0.000019 U	0.00002 U
Benzo(a)pyrene	SPLP/SVOC	mg/l	0.0000039 U	-	0.0000039 U	-	-	-	0.0000039 U	0.00000 U
Benzo(b)fluoranthene	SPLP/SVOC	mg/l	0.000017 U	-	0.000017 U	-	-	-	0.000017 U	0.00002 U
Benzo(k)fluoranthene	SPLP/SVOC	mg/l	0.000021 U	-	0.000021 U	-	-	-	0.000021 U	0.00002 U
bis(2-Ethylhexyl)phthalate	SPLP/SVOC	mg/l	0.00013 U	-	0.00013 U	-	-	-	0.00013 U	0.00013 U
Chrysene	SPLP/SVOC	mg/l	0.0000093 U	-	0.0000093 U	-	-	-	0.0000093 U	0.00001 U
Indeno(1,2,3-cd)pyrene	SPLP/SVOC	mg/l	0.0000085 U	-	0.0000085 U	-	-	-	0.0000085 U	0.00001 U
TCLP METALS										
Arsenic	TCLP/Metals	mg/l	0.5 U	0.5 U	0.5 U	0.5 U	-	0.5 U	0.5 U	0.5 U
Barium	TCLP/Metals	mg/l	1 U	1 U	1 U	1 U	-	1	1 U	1.0
Cadmium	TCLP/Metals	mg/l	0.0092	0.005 U	0.005 U	0.005 U	-	0.005 U	0.005 U	0.0
Chromium	TCLP/Metals	mg/l	0.01	0.01 U	0.01 U	0.01 U	-	0.014	0.011	0.0
Cobalt	TCLP/Metals	mg/l	0.05 U	0.05 U	0.05 U	0.05 U	-	0.05 U	0.05 U	0.1 U
Copper	TCLP/Metals	mg/l	0.15	0.025 U	0.025	0.025 U	-	0.034	0.026	0.0
Lead	TCLP/Metals	mg/l	0.5 U	0.5 U	0.5 U	0.5 U	-	0.5 U	0.5 U	0.5 U
Manganese	TCLP/Metals	mg/l	0.21	0.071	0.037	0.032	-	0.037	0.034	0.1

TABLE 2. ANALYTICAL RESULTS ECOMELT® SAMPLES LEACHING TESTS
PHASE 2 CEMENT-LOCK DEMONSTRATION
Bayonne, New Jersey

Compound	Class	Units	P2-SEM-01	P2-SEM-02	P2-SEM-03	P2-SEM-04	P2-SEM-04	P2-SEM-05	P2-SEM-06	Average
Mercury	TCLP/Metals	mg/l	0.0002 U	0.0002 U	0.0002 U	0.0002 U	-	0.0002 U	0.0002 U	0.0 U
Nickel	TCLP/Metals	mg/l	0.12	0.04	0.04 U	0.04 U	-	0.04 U	0.04 U	0.1
Selenium	TCLP/Metals	mg/l	0.5 U	0.5 U	0.5 U	0.5 U	-	0.5 U	0.5 U	0.5 U
Silver	TCLP/Metals	mg/l	0.01 U	0.01 U	0.01 U	0.01 U	-	0.01 U	0.01 U	0.0 U
Zinc	TCLP/Metals	mg/l	0.7	0.31	0.16	0.13	-	0.22	0.17	0.3
TCLP PESTICIDES										
4,4'-DDD	TCLP/Pest	mg/l	0.00017 U	0.00017 U	0.000017 UJ	0.00017 U	-	0.00017 U	0.00017 U	0.000145 U
4,4'-DDE	TCLP/Pest	mg/l	0.000041 U	0.000041 U	0.000041 U	0.000041 U	-	0.000041 U	0.000041 U	0.000041 U
4,4'-DDT	TCLP/Pest	mg/l	0.00018 U	0.00018 U	0.00018 U	0.00018 U	-	0.00018 U	0.00018 U	0.000180 U
Dieldrin	TCLP/Pest	mg/l	0.000013 U	0.00013 U	0.00013 U	0.00013 U	-	0.00013 U	0.00013 U	0.000111 U
TCLP SVOCs										
Acenaphthene	TCLP/SVOC	mg/l	0.000054 U	0.000054 U	0.000054 U	0.000054 U	-	0.000054 U	0.000054 U	0.0000540 U
Acenaphthylene	TCLP/SVOC	mg/l	0.000021 U	0.000021 U	0.000021 U	0.000021 U	-	0.000021 U	0.000021 U	0.0000210 U
Anthracene	TCLP/SVOC	mg/l	0.000029 U	0.000029 U	0.000029 U	0.000029 U	-	0.000029 U	0.000029 U	0.0000290 U
Benzo(a)anthracene	TCLP/SVOC	mg/l	0.00019 U	0.00019 U	0.00019 U	0.00019 U	-	0.00019 U	0.00019 U	0.0001900 U
Benzo(a)pyrene	TCLP/SVOC	mg/l	0.000039 U	0.000039 U	0.000039 U	0.000039 U	-	0.000039 U	0.000039 U	0.0000390 U
Benzo(b)fluoranthene	TCLP/SVOC	mg/l	0.00017 U	0.00017 U	0.00017 U	0.00017 U	-	0.00017 U	0.00017 U	0.0001700 U
Benzo(g,h,i)perylene	TCLP/SVOC	mg/l	0.000088 U	0.000088 U	0.000088 U	0.000088 U	-	0.000088 U	0.000088 U	0.0000880 U
Benzo(k)fluoranthene	TCLP/SVOC	mg/l	0.00021 U	0.00021 U	0.00021 U	0.00021 U	-	0.00021 U	0.00021 U	0.0002100 U
bis(2-Ethylhexyl)phthalate	TCLP/SVOC	mg/l	0.0013 U	0.0013 U	0.0013 U	0.0013 U	-	0.0013 U	0.0013 U	0.0013000 U
Chrysene	TCLP/SVOC	mg/l	0.000093 U	0.000093 U	0.000093 U	0.000093 U	-	0.000093 U	0.000093 U	0.0000930 U
Dibenzo(a,h)anthracene	TCLP/SVOC	mg/l	0.00012 U	0.00012 U	0.00012 U	0.00012 U	-	0.00012 U	0.00012 U	0.0001200 U
Di-n-octyl phthalate	TCLP/SVOC	mg/l	0.002 U	0.002 U	0.002 U	0.002 U	-	0.002 U	0.002 U	0.0020000 U
Fluoranthene	TCLP/SVOC	mg/l	0.0002 U	0.0002 U	0.0002 U	0.0002 U	-	0.0002 U	0.0002 U	0.0002000 U
Fluorene	TCLP/SVOC	mg/l	0.000077 U	0.000077 U	0.000077 U	0.000077 U	-	0.000077 U	0.000077 U	0.0000770 U
Indeno(1,2,3-cd)pyrene	TCLP/SVOC	mg/l	0.000085 U	0.000085 U	0.000085 U	0.000085 U	-	0.000085 U	0.000085 U	0.0000850 U
Naphthalene	TCLP/SVOC	mg/l	0.000082 U	0.000082 U	0.000082 U	0.000082 U	-	0.000082 U	0.000082 U	0.0000820 U
Phenanthrene	TCLP/SVOC	mg/l	0.000099 U	0.000099 U	0.000099 U	0.000099 U	-	0.000099 U	0.000099 U	0.0000990 U
Pyrene	TCLP/SVOC	mg/l	0.00011 U	0.00011 U	0.00011 U	0.00011 U	-	0.00011 U	0.00011 U	0.0001100 U

Notes:

U - Analyte was not detected. The associated value is the estimated detection limit.

J - The analyte is present, but the concentration is below the quantitation limit. The concentration is estimated

UJ - The detection limit is estimated.

C - The isomer coeluted with another of its homologue group. If followed by a number, the number indicates the lowest numbered congener among the coelution set.

"-" The sample was not analyzed for that analyte.

* The total of these analytes includes non-detected values at the detection limit