U.S. Environmental Protection Agency, Region 2
U.S. Army Corps of Engineers
Brookhaven National Laboratory

BioGenesis℠ Sediment Washing Technology

Full-Scale, 40 cy/hr, Sediment Decontamination Facility for the NY/NJ Harbor Region

Final Report on the Pilot Demonstration Project

December 1999

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BioGenesis^{SM} Sediment Washing Technology
Full-Scale, 40 Cy/Hr,
Sediment Decontamination Facility
For The NY/NJ Harbor

Final Report On The Pilot Demonstration Project

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EXECUTIVE SUMMARY

ES.1 PILOT PROJECT ABSTRACT

Presented in this report are the results of a 700 cubic yard (cy) dredged material pilot demonstration of the BioGenesis^{SM} Sediment Washing Technology. This Pilot Demonstration Project was conducted in Kearny, New Jersey by BioGenesis Enterprises, Inc. (BioGenesis) and Roy F. Weston, Inc. (WESTON®) under Brookhaven National Laboratory (BNL) Contract No. 725044, as part of the Water Resources Development Act (WRDA) Sediment Decontamination Demonstration Program. The purpose of the pilot project was to evaluate the effectiveness of the BioGenesis^{SM} Sediment Washing Technology at a large scale and collect design data for scale-up activities. Data collected through an extensive testing program showed the technology is capable of decontaminating dredged material from the New York/New Jersey (NY/NJ) Harbor. Additional work performed to evaluate end-products for decontaminated dredged material, showed the treated material can be considered a resource and sold in existing markets. Financial projections of commercial-scale operations (500,000 cy/yr) indicate the technology can be an economically viable solution for management of NY/NJ Harbor dredged material at a projected treatment cost of $29 to $35 per cy. BioGenesis and WESTON recommend the BioGenesis^{SM} Sediment Washing Technology proceed to full-scale facility implementation to provide a decontamination option for dredged material in the NY/NJ Harbor.

ES.2 BACKGROUND

Under WRDA of 1992 and 1996, Congress authorized funding to develop a Sediment Decontamination Demonstration Program with a goal of demonstrating one or more facilities with the capacity to commercially decontaminate up to 500,000 cy of contaminated dredged material annually from the NY/NJ Harbor (WRDA Program). The WRDA Program emphasizes rapid development of environmentally responsible and cost-effective methods for decontamination of dredged material. The U.S. Environmental Protection Agency (EPA) – Region 2, and the U.S. Army Corps of Engineers (USACE) – New York District, share joint authority over the management of the WRDA Program with EPA acting as Program Lead. Collaborating with EPA and USACE is the U.S. Department of Energy – Brookhaven National

Laboratory (BNL) who conducts technical project management and contracting/procurement services for the WRDA Program through Interagency Agreements with EPA.

BNL has contracted BioGenesis (BNL Contract No. 725044) to conduct a three phase Sediment Decontamination Demonstration Project:

- Phase 1 – Pilot Demonstration Project (700 cy).
- Phase 2 – Full-Scale Plant Design and Construction.
- Phase 3 – Full-Scale Operations (10,000 to 15,000 cy).

Presented in this report are the results and supporting studies of the Phase 1 – Pilot Demonstration Project work performed by BioGenesis and WESTON. In addition, this report presents plans for future Phase 2 and 3 (full-scale) activities based on the pilot-scale results. The completion of this Pilot Demonstration Project represents a significant milestone achievement for the WRDA Program as it moves towards "fast-track" commercial-scale implementation. These efforts have contributed to the development of the design data that will lead to full-scale (250,000 cy/yr) and commercial-scale (500,000 cy/yr) implementation of the BioGenesis^{SM} Sediment Washing Technology.

ES.3 OVERVIEW OF PILOT DEMONSTRATION PROJECT

From November 1998 through March 1999, BioGenesis and WESTON conducted a 700 cy dredged material pilot demonstration of the BioGenesis^{SM} Sediment Washing Process in Kearny, New Jersey. The project involved a complete *treatment train* approach that included dredging, materials handling, pilot-scale equipment optimization, liquid/solid separation, residual management, extensive analytical testing, demonstration of blending of a manufactured soil end-products, and evaluation of process economics. The objectives of the Pilot Demonstration Project were:

1. Evaluate the effectiveness of the BioGenesis^{SM} Sediment Washing Technology to reduce contaminant concentrations in dredged material.

2. Evaluate pilot-scale equipment performance under different operating conditions and establish optimum operating conditions for the pilot equipment.

3. Collect sufficient data for mass balance calculations and Phase 2 scale-up design activities.

4. Validate pilot-scale system performance by showing data repeatability in multiple process batches.

5. Perform economic cost projections for commercial-scale operations.

The analytical testing program developed for the Pilot Demonstration Project was divided into two tasks; Pilot System Testing, where system operating conditions were altered on a batch-by-batch basis to meet objectives 1, 2, 3, and 5 as outlined above; and Process Validation, where several batches were processed at similar operating conditions to meet objectives 1, 3, and 4 as outlined above.

ES.4 DESCRIPTION OF BIOGENESIS^{SM} SEDIMENT WASHING TECHNOLOGY

The BioGenesis^{SM} Sediment Washing Technology is an innovative technology that has been shown in bench and pilot studies to remove organic and inorganic contaminants from a broad range of sediment particle grain sizes. Conventional soil washing technologies have limited applicability to typical dredged materials because they cannot remove contaminants from fine-grained particles such as silts and clays (FRTR, 1997). The BioGenesis^{SM} Sediment Washing Technology is designed to overcome these limitations and decontaminate fine grained (silt and clay) sediment particles by isolating individual particles and removing the adsorbed contaminants along with the naturally occurring organic material (NOM) coating each particle.

A schematic of the pilot-scale BioGenesis^{SM} Sediment Washing Process is illustrated in Figure ES-1. The pilot-scale process includes seven steps from dredged material preparation, through individual treatment processes, to beneficial use. At the beginning of treatment, the process uses proprietary biodegradable surfactants, specialty chemicals, and chelators for metal separations. Floatable organics are removed in an aeration step, and collision impact forces are used to strip the sorbed contaminants and organic coatings from the solid particles in the sediment washing step. Destruction of the organic material which has been removed from the sediment particles is accomplished in the cavitation and oxidation step. The decontaminated sediment particles are removed from the water phase in the liquid/solid separation step using mechanical methods (centrifuge), with the resulting cake (post-treated material) containing cleaned sand, silt and clay

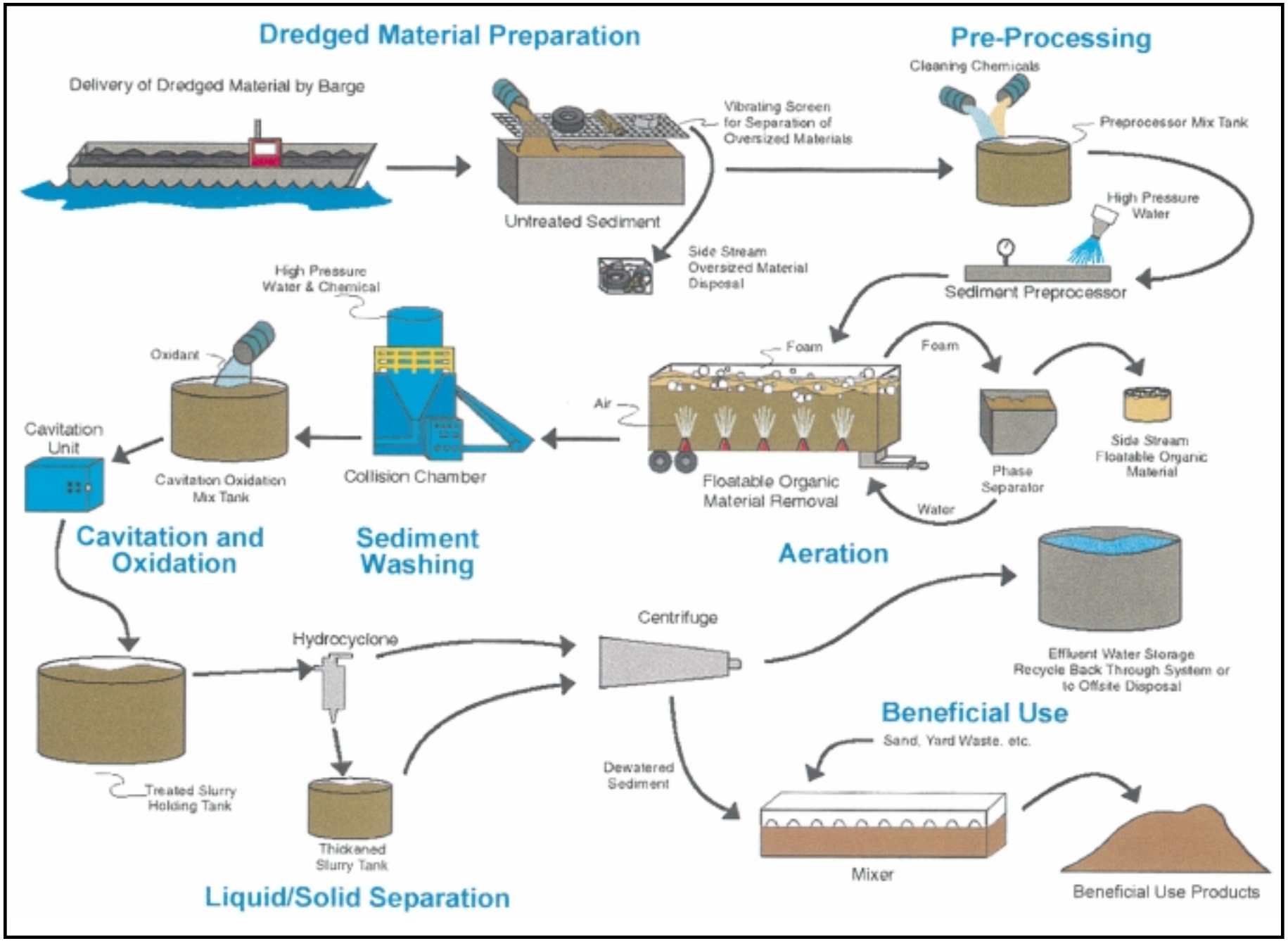

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FIGURE ES-1 BIOGENESIS^{SM} SEDIMENT WASHING PROCESS

particles at approximately 30% moisture. In the beneficial use step, post-treated material is mixed with amendments to create beneficial use soil products. Wastewater from the process can be treated and reused in the process.

ES.5 SUMMARY OF RESULTS

Dredged Material Source

The Pilot Demonstration Project was conducted on dredged material from the Stratus Petroleum Corporation - Newark Terminal Site located in Newark, New Jersey on upper Newark Bay, lower Passaic River. The site was selected by the WRDA Program to be representative of typical NY/NJ Harbor dredged material based on historical testing data showing elevated contaminant concentrations. The material was dredged by the USACE – New York District *Marine Vessel (m/v) Hayward* in cooperation with Stratus and the WRDA Program.

Presented in Table ES-1 is a summary of the physical characteristics and analytical results for the homogenized, raw dredged material compared to typical NY/NJ Harbor sediment. Despite the historical testing results, physical and chemical testing of the sediment dredged from the Stratus Petroleum site showed very fine grained material (52% silt, 42% clay, and 4% sand) with relatively low concentrations of inorganic and organic contaminants compared to typical NY/NJ Harbor sediment. This may have been a result of successive dredging in one area of the site which resulted in cleaner material being dredged with shallower, more contaminated material, with the resulting total being homogenized prior to analytical testing. The challenge of the Pilot Demonstration Project was therefore, decontaminating very fine-grained, dredged material with relatively low levels of contamination.

Dredged Material Preparation

The dredged material was removed from the transport scow using a trackhoe and mixed with water in a roll-off container until the resulting mixture reached approximately 32% solids. The BioGenesis^{SM} Sediment Washing Process has been designed to handle up to ¼ inch material, therefore the sediment slurry was pumped from the roll-off to a vibrating screen which removed oversized material greater than ¼ inch. The screened slurry was homogenized in eight 18,100 gallon capacity raw sediment mixing tanks prior to treatment.

Table ES-1

Comparison of Pilot Project Dredged Material to Typical Ranges of NY/NJ Harbor Federal Navigation and Private Berthing Maintenance Dredged Material

Selected Chemical Physical Characteristics	Typical Range NY/NJ Harbor Federal Navigation Sediment[1]	Pilot Demonstration Project Raw Sediment (Average)
Dioxins/Furans (pg/g)		
2,3,7,8-TCDD	0-529	39.0
TCDD/TCDF TEQ	61-224	57.5
Total Polychlorinated Biphenyls (mg/kg)	0.05-3.32	0.205
Polynuclear Aromatic Hydrocarbons (ug/kg)		
Anthracene	233-57,500	ND (<330)
Benzo(a)anthracene	151-23,400	ND (<330)
Benzo(a)pyrene	214-19,400	ND (<330)
Chrysene	175-23,500	ND (<330)
Fluoranthene	233-57,500	ND (<330)
Total PAHs	2,000-306,000	277
Pesticides (ug/kg)		
4-4'-DDD	0.1-2,070	2.9
4-4'-DDE	2-250	3.3
Metals (mg/kg)		
Arsenic	4-97	11.4
Cadmium	0.2-73	2.6
Chromium	15-245	132
Lead	17-580	137
Mercury	0.2-13.6	3.1
Nickel	10-870	32.3
Silver	0.15-16	2.3
Zinc	41-625	244
Grain Size Distribution		
Sand (>0.0625 mm)	4% - 28%	6%
Silt (0.0039 to 0.0625 mm)	36%-84%	52%
Clay (<0.0039 mm)	12%-36%	42%

[1] Reference for dioxins/furans, total polychlorinated biphenlys (PCBs), polynuclear aromatic hydrocarbons (PAHs), pesticides, herbicides, and metals: Reiss, 1999. Reference for grain size distribution: PANY/NJ, 1996.

Dredged Material Processing

The BioGenesis^{SM} Sediment Washing Technology consists of four main core processes: (1) pre-processing, (2) aeration, (3) sediment washing, and (4) cavitation and oxidation. Following the core processing, the decontaminated sediment is dewatered. During Pilot System Testing, the operating conditions for the pilot-scale process equipment were varied to investigate how process effectiveness was affected by different operating conditions. This was accomplished by changing operating conditions on a batch-by-batch basis and evaluating the impact on the sediment slurry. Presented in Table ES-2 is a summary of the Pilot System Testing results.

Following the Pilot System Testing, Process Validation was conducted using "optimum operating conditions" established for the pilot-scale equipment during Pilot System Testing. Presented in Table ES-3 are the average results for the raw sediment slurry (RAW-SD), the solid fraction of the raw sediment slurry (RAW-SL), and the treated solids (PSD-SL). During Process Validation, slurry samples were separated into solid (SL) and liquid (AQ) fractions and analyzed separately to determine the partitioning of contaminants. As illustrated in Table ES-3, the solid fraction of the untreated sediment (RAW-SL) showed higher concentrations than the raw sediment slurry (RAW-SD) in some cases. Therefore, removal/destruction efficiencies have been calculated for the pilot-scale results between the solid fraction of the raw sediment (RAW-SL) and the treated solids (PSD-SL).

While the objectives of the Pilot Demonstration Project did not require removal/destruction of contaminants to a specific level, the New York and New Jersey soil standards are included in Table ES-3 for comparison. Note that removal/destruction results depend on grain size, initial contaminant concentration levels, total organic carbon content, and the operating conditions of the pilot-scale process equipment (i.e., chemical addition rates, etc.).

Mass Balance

Data collected during the Pilot Demonstration Project was used to perform mass balance calculations to track the fate of the contaminants in the dredged material through the BioGenesis^{SM} Sediment Washing Process. These calculations, provided in Appendix E, showed

Table ES-2

Summary of Pilot System Testing Results

Unit Process	Function	Testing Results/Conclusions
Screening Operations	1. Remove oversized debris greater than ¼ inch.	1. Shaker screen effective in removing oversized material. 2. Less than 1 cy of oversized material was removed from the Stratus Petroleum dredged material.
Pre-processor	1. Physically separate sediment particles from each other. 2. Begin to break up naturally occurring organic material. 3. Blend chemicals with sediment slurry.	1. Pre-processor operated as expected based on visual observations of sediment characteristics (consistency, color, etc.)
Aerator	1. Remove floatable, naturally occurring, organic material broken-up in the pre-processor. 2. Remove free-phase organic contaminants.	1. No floatable or free-phase organic materials were recovered. 2. Visual observations indicated no floatable organics. 3. Aeration to be included in future operations as an inexpensive way to remove floatable organics if present.
Sediment Washer	1. Strip the organic material and contaminants from individual sediment particles using collision forces.	1. Organic and inorganic contaminants were transferred from the solids to the liquid phase. 2. Repetitive processing through the sediment washer can achieve additional removal effectiveness.
Cavitation and Oxidation	1. Destroy complex organic compounds using oxidation and cavitation. 2. Uses oxidants such as hydrogen peroxide and/or sodium percarbonate. 3. Cavitation increases organic oxidation.	1. Effectiveness limited by the amount of oxidant that could be added during the Pilot Demonstration Project due to a limitation of the pilot-scale equipment. 2. Testing Phase sampling did not achieve repeatable results due to the low level of oxidant used. This was partially corrected during Process Validation. 3. Full-scale operations will need the ability to adjust oxidant addition rates and cavitation time.
Liquid/Solid Separation	1. Mechanically remove decontaminated sediment particles from the liquid phase. 2. No chemical precipitation or flocculation.	1. Primary low speed centrifuge produced a cake at 60-70% solids. 2. Primary centrifuge recovered approximately 72% of solid particles. 3. Secondary, high speed centrifuge could recover additional solid particles in the treated sediment cake.

Table ES-3

Summary of Process Validation Results

Selected Contaminants	Average Inlet Sediment (RAW-SD)	Average Inlet Solids (RAW-SL)	Average Treated Sediment (PSD-SL)	Percent Removal	NY Recommended Soil Cleanup Standards[1]	NJ Residential Soil Cleanup Standards[2]	NJ Non-Residential Soil Cleanup Standards[2]
Dioxins/Furans (pg/g)							
2,3,7,8-TCDD	39.0	91.3	35.3	61%	—	—	—
TCDD/TCDF TEQ	57.5	129	49.0	62%	—	—	—
Total PCBs (mg/kg)	0.205	0.398	0.220	45%	1.0	0.49	2
PAHs (ug/kg)							
Anthracene	ND	1,467	ND	89%	50,000	10,000,000	10,000,000
Benzo(a)anthracene	ND	2,433	1,600	34%	224	900	4,000
Benzo(a)pyrene	ND	2,433	1,633	33%	61	660	660
Chrysene	ND	2,767	1,767	36%	400	9,000	40,000
Fluoranthene	ND	6,500	2,933	42%	50,000	2,300,000	10,000,000
Total PAHs	277	33,077	16,537	50%	—	—	—
Pesticides (ug/kg)							
4-4'-DDD	2.9	25.3	15.7	38%	2,900	3,000	12,000
4-4'-DDE	3.3	41.7	20.3	51%	2,100	2,000	9,000
Metals (mg/kg)							
Arsenic	11.4	12.3	7.8	36%	7.5	20	20
Cadmium	2.6	3.1	1.2	61%	1	39	100
Lead	137	157	67.9	57%	Site Bkgnd.	400	600
Mercury	3.1	3.9	0.30	92%	0.1	14	270
Nickel	32.3	32.4	24.6	24%	13	250	2,400
Silver	2.3	3.3	0.93	72%	Site Bkgnd.	110	4,100
Zinc	244	279	131	53%	20	1,500	1,500

[1] Reference: NYDEC, 1994
[2] Reference: NJDEP, 1999

closure within the variability of the data for inorganic compounds (metals of concern). Since organic compounds are oxidized in the BioGenesis^{SM} Sediment Washing Process, the mass balance for organic compounds showed a reduction in mass of organics. This data evaluation will be used during scale-up design activities for full-scale equipment selection and sizing.

Beneficial Use Evaluation

Dredged materials from NY/NJ Harbor can be a valuable resource once they have been decontaminated. BioGenesis proposes to create manufactured soil products from decontaminated sediment during future operations. In order to investigate a commercially viable end product, BioGenesis and WESTON conducted a Beneficial Use Evaluation during the Pilot Demonstration Project. The objective of the evaluation was to gather information needed to develop at least one salable commercial end product with the potential of obtaining an Acceptable Use Determination (AUD) from the New Jersey Department of Environmental Protection (NJDEP). The evaluation consisted of three major components:

- Bench-scale product formulation and testing.
- Full-scale demonstration of blending procedures.
- Market evaluation to determine the product needs of potential customers.

The bench-scale study, conducted by Cornell University, involved using pilot-scale decontaminated dredged material from the BioGenesis^{SM} Sediment Washing Process in several planting mediums. Growth tests with lettuce were performed on this material. Preliminary results indicate that the decontaminated dredged material has no negative impacts on the growth of lettuce.

The market evaluation determined that there is a viable market for manufactured soil products in both bulk and bags. The private label market for a bagged product is estimated to be approximately 15-18 million bags per year in the NY/NJ region. Market survey results indicate that the NY/NJ regional bulk wholesale market for top soil could be as high as six (6) million cy per year. Initially the product could be marketed regionally for the NY and NJ area. By teaming with a national distributor, it is possible to market this product throughout the United States and Canada.

Residuals Management

The primary residuals from the Pilot Demonstration Project include the decontaminated dredged materials and wastewater. Since this was a pilot study, the decontaminated dredged material was placed onsite. The residuals from the Pilot Demonstration Project were managed as follows:

- The dredged material decontaminated during the Pilot Demonstration Project along with the excess dredged materials left in the barge, were stabilized by SK Services (East), L.C. (SK Services) in accordance with placement criteria for the Kopper's Coke/Seaboard Brownfield Site.

- Wastewater generated during the Pilot Demonstration Project was collected in a 20,000-gallon steel tank throughout the course of the field program. Approximately 298,000 gallons of wastewater were generated and disposed at Passaic Valley Sewerage Commission during the Pilot Demonstration Project. This included centrate from the liquid/solid separation activities (water and fines), washwater and process water.

- Oversized material recovered during the screening activities was stabilized by SK Services along with the excess dredged material.

- Solid wastes such as personal protective equipment, trash, etc. generated during the project were disposed in accordance with applicable NJ regulations.

ES.6 FUTURE ACTIVITIES

In order to proceed to Phases 2 and 3 of the BioGenesis Sediment Decontamination Demonstration Program, the following challenges need to be addressed to ensure the ability of the BioGenesis^{SM} Sediment Washing Technology to decontaminate dredged materials from the NY/NJ Harbor in an economic and environmentally responsible manner:

- A comparison of the typical characteristics of the NY/NJ Harbor federal navigation channel sediments to those of the Stratus Petroleum dredged material shows the pilot material to be much finer grained and have concentrations of organic and inorganic contaminants on the low end of the range for typical harbor dredged material. The difference between these materials is significant. In general, a higher level of effort (treatment time, chemical addition, energy, etc.) is required to treat low concentration, fine-grained material because the contaminants are tightly bound to the fine-grained material. The Pilot Demonstration Project showed the BioGenesis^{SM} Sediment Washing Process is effective in reducing organic and inorganic concentrations in the Stratus Petroleum dredged material. This demonstration project represented a conservative scenario for future operations. It is therefore, projected that the BioGenesis^{SM} Sediment Washing Technology can effectively decontaminate

sediment from the NY/NJ Harbor federal navigation channels to acceptable regulatory soil standards with less effort.

- BioGenesis proposes to use decontaminated sediment from the BioGenesis^{SM} Sediment Washing Process as an amendment to a manufactured soil product. A beneficial use bench study showed the viability of using sediment in a manufactured soil product, and a market evaluation showed the marketability of that manufactured soil product.

- In order to be able to market the soil product manufactured from dredged materials in New Jersey, BioGenesis and WESTON will need to apply for and receive an AUD from the state of New Jersey. It is BioGenesis' and WESTON's intent to propose a "sliding scale" series of treatment goals, each with specific acceptable end products, under an AUD for the full-scale facility. The results of the Pilot Demonstration Project have shown that the level of decontamination of the sediment depends on the amount of treatment effort applied (i.e., treatment time, chemical addition, energy, etc.) and during full-scale operations, an economic evaluation of system performance will drive the amount of treatment and resulting end product.

- BioGenesis has leased a 27 acre site in South Kearny, New Jersey from the BASF Corporation as the location for Phase 3 – Operations of the BioGenesis Sediment Decontamination Demonstration Project and future commercial-scale operations. The site is a vacant, demolished manufacturing facility, which is a candidate for brownfields redevelopment activities.

- In fulfillment of requirements of BNL Contract No. 725044, BioGenesis in conjunction with WESTON, the WRDA Program, and the State of NJ, has identified the following two sources of dredged material as potential sources of material for Phase 3 – Operations, of the BioGenesis Sediment Decontamination Demonstration Project.

  – NJ Office of Maritime Resources (NJMR), *Sediment Decontamination Demonstration Project.* (approximately 80,000 cy)

  – NJDEP, USACE, *Joseph G. Minish Passaic River Waterfront Development Park Project*. (approximately 1,650 cy)

- Financial projections of treatment costs for the full-scale BioGenesis^{SM} Sediment Washing Process facility have been made based on the results of the Pilot Demonstration Project. A summary of the projected treatment costs for the initial 80,000 cy NJMR demonstration project in collaboration with the WRDA program along with future commercial-scale (500,000 cy/yr) treatment costs is presented in Table ES-4.

Table ES-4

Cost Projections

	WRDA/NJMR Demonstration Project 80,000 cy (40 cy/hr Facility)	**Commercial-Scale Facility 500,000 cy/yr (80 cy/hr Facility)**
Analytical Costs	$6/cy	$2 /cy
Operating Expenses Field Offices Utilities Maintenance Waste Disposal Beneficial Use Sale	$18/cy	$3-9 /cy
Equipment Rentals/Lease	$13/cy	$3 /cy
Labor and Expenses Union Labor Management Labor	$35/cy	$10 /cy
Chemical Costs	$17/cy	$11 /cy
Total "Tipping Fee"	$89 /cy	$29-35 /cy

ES.7 CONCLUSIONS

The following conclusions can be drawn from the results of the Pilot Demonstration Project of the BioGenesis^{SM} Sediment Washing Technology discussed in this report:

- The BioGenesis^{SM} Sediment Washing Technology can effectively reduce concentrations of organic and inorganic contaminants from NY/NJ Harbor dredged materials to regulatory soil standards for beneficial use.
- The BioGenesis^{SM} Sediment Washing Technology pilot-scale equipment has the ability to adjust the level of treatment by varying retention times, chemical addition ratios, etc. This agrees with results from previous bench-scale testing conducted under the WRDA Program (BioGenesis, 1998).
- Treated sediment can be beneficially used in a manufactured soil product which can be marketed in the NY/NJ Harbor area.
- BioGenesis has leased a site in Kearny, NJ for Phase 3 – Operations and future commercial-scale activities.
- As required under BNL Contract No. 725044, BioGenesis has identified sources of material for Phase 2 and 3 activities.
- BioGenesis and WESTON have joined to perform Phase 2 and 3 activities for the collaboration of the NJMR and WRDA programs.
- Financial projections of commercial-scale operations indicate the BioGenesis^{SM} Sediment Washing Process can be an economically viable solution for management of NY/NJ Harbor dredged material at a treatment cost of $29-35 per cy.

Based on these conclusions BioGenesis and WESTON recommend the BioGenesis^{SM} Sediment Washing Technology proceed to Phases 2 and 3 of the Sediment Decontamination Demonstration Project.

1. INTRODUCTION

Presented in this report are the results of a 700 cubic yard (cy) dredged material pilot demonstration of the BioGenesis^{SM} Sediment Washing Technology. This Pilot Demonstration Project was conducted by BioGenesis Enterprises, Inc. (BioGenesis) and Roy F. Weston, Inc. (WESTON®) under Brookhaven National Laboratory (BNL) Contract No. 725044 as part of the Water Resources Development Act (WRDA) Sediment Decontamination Demonstration Program. This is a final report of the Pilot Demonstration activities and it provides the basis to proceeding to a full-scale, 40 cy/hr, facility demonstration.

1.1 BACKGROUND

Since the nineteenth century, routine dredging of the New York/New Jersey (NY/NJ) Harbor, in the New York metropolitan region, has been necessary to maintain the water passages and berthing channels to accommodate modern shipping. These water channels, which have a natural depth of approximately 19 ft, require sediment removal to depths of at least 40 ft to allow for safe navigation of vessels through the harbor. Historically, this maintenance dredged material, which amounted to approximately 6 to 7 million cy annually, has been disposed of at a designated location in the Atlantic Ocean off the New Jersey coast (the "Mud Dump" site). However, changes to the ocean disposal testing criteria in 1991 have set stricter standards as to which sediment material may be disposed at sea and in 1997, EPA terminated the use of the historic Mud Dump site. The Mud Dump currently referred to as the Historical Area Remediation Site (HARS) is now being "capped" with available clean or "unrestricted category 1" dredged material from current and future NY/NJ Harbor navigation maintenance projects. Based on the concentrations of heavy metals, organic compounds, and other chemical constituents present in the NY/NJ Harbor sediments, the USACE estimates that approximately 2.3 million cy of material projected to be dredged annually through 2040 is not suitable as HARS remediation material and will require an alternate disposal and/or treatment method (USACE, 1999).

1.2 WRDA PROGRAM BACKGROUND

Under the WRDA of 1992 (Section 405C) and 1996 (Section 226), Congress authorized funding to develop a Sediment Decontamination Demonstration Program with a goal of demonstrating one or more facilities with the capacity to commercially decontaminate up to 500,000 cy of contaminated dredged material annually from the NY/NJ Harbor (WRDA Program). The WRDA Program emphasizes rapid development of environmentally responsible and cost-effective methods for decontamination of dredged material. The U.S. Environmental Protection Agency (EPA) – Region 2, and the U.S. Army Corps of Engineers (USACE) – New York District, share joint authority over the management of the WRDA Program with EPA acting as Program Lead. Collaborating with EPA and USACE is the U.S. Department of Energy (DOE) – Brookhaven National Laboratory (BNL), who conducts technical project management and contracting/procurement services for the WRDA Program through Interagency Agreements with EPA.

The WRDA Program has progressed through demonstrations of varying technologies at bench- and pilot-scales and is now moving toward construction of commercial-scale facilities. This step-wise procedure has resulted in a reduction of the number of participants through several factors, including technical performance, demonstration costs, private-public cost sharing, beneficial use of treated material, and evaluations of the business potential for commercial-scale decontamination. The BioGenesis^{SM} Sediment Washing Technology has been designated to proceed from bench- to pilot-scale demonstrations. These efforts have contributed to the development of design data that will lead to full-scale (250,000 cy/yr) and commercial-scale (500,000 cy/yr) implementation of the BioGenesis^{SM} Sediment Washing Technology.

BioGenesis has teamed with WESTON for the demonstration program. WESTON provides the engineering, construction, and operational skills needed to move the technology into the commercial marketplace. Federal funding from the WRDA legislation provides assistance to the commercialization process, while the private sector will provide the capital needed for facility construction and operations.

1.3 OBJECTIVES

1.3.1 WRDA Program

The ultimate objective of the WRDA program is to establish one or more technologies/firms with the capability to commercially decontaminate 500,000 cy of contaminated dredged materials annually from the NY/NJ Harbor in a cost effective and environmentally responsible manner. Towards this objective, BNL has contracted BioGenesis (BNL Contract No. 725044) to conduct a three phase Sediment Decontamination Demonstration Project:

1. Phase 1 – Pilot Demonstration Project: Processing of a total of 700 cy of contaminated dredged material through the BioGenesis^{SM} Sediment Washing Process pilot-scale equipment.

2. Phase 2 – Full-Scale Plant Design and Construction: Full-scale (40 cy/hr) equipment will be selected and procured, and a full-scale plant will be designed and constructed based on Phase 1 results.

3. Phase 3 – Full-Scale Operations: The full-scale plant (40 cy/hr) will be used to demonstrate treatment of a minimum of 10,000 to 15,000 cy of dredged material from the NY/NJ Harbor.

1.3.2 Pilot Demonstration Project

The objective of the Pilot Demonstration Project is to demonstrate that reduction/removal of contaminants in sediment could be achieved by the BioGenesis^{SM} Sediment Washing Technology at large scale and that the results could be reproduced.

The following specific objectives were established for the Pilot Demonstration Project:

1. Evaluate the effectiveness of the BioGenesis^{SM} Sediment Washing Technology to reduce contaminant concentrations in dredged material.

2. Evaluate pilot-scale equipment performance under different operating conditions and establish optimum operating conditions for the pilot equipment.

3. Collect sufficient data for mass balance calculations and Phase 2 scale-up design activities.

4. Validate pilot-scale system performance by showing data repeatability in multiple process batches.

5. Perform economic cost projections for commercial-scale operations.

The following testing program was developed to meet these objectives.

- Startup/Shakedown – Mechanical checkout of processing equipment, no testing/sampling performed.
- Pilot System Testing – System operating conditions were altered for each batch to meet objectives 1, 2, 3, and 5 as outlined above. Analytical testing of indicator compounds was performed.
- Process Validation – Several batches of dredged material were processed at similar operating conditions based on Pilot System Testing results. A extensive analytical testing program was performed. Samples were collected throughout the process to meet objectives 1, 3, and 4 as outlined above.

1.4 NY/NJ HARBOR CHARACTERISTICS

1.4.1 Overview

The NY/NJ Harbor is a complex marine and estuarine system that combines river currents with tidal effects, causing changes in salinity and mixing of the fresh and salt water. The significance of this interplay between river and estuarine systems is the effect on transport of sediments and contaminants in the system. As erosion on the land occurs, sediment particles enter the water and are transported with the current until they eventually settle on the bottom. Contaminants that have also entered the water column from point and non-point sources and are attracted to suspended sediment particles and also eventually settle to the bottom.

Under authorization by Congress, the USACE – NY District has built and maintains a system of over 240 miles of federal navigational channels in the NY/NJ region that require depths up to 40 feet to enable the passage of ships. Without dredging, some of these channels are naturally only 19 feet deep. The USACE projects to dredge an average of 3.7 million cy per year to maintain safe navigation of federal navigation channels approximately 2.3 million cy per year of this material is not suitable for HARS. (USACE, 1999)

1.4.2 Harbor Contaminants

The origin of organic and inorganic contaminants in the NY/NJ Harbor is primarily due to industrial activities in New Jersey and New York. This includes point sources such as historical industrial discharges and sewage treatment plants as well as non-point sources such as urban runoff, landfill leachate, and atmospheric fallout. Because of the wide range of activities in this heavily industrialized area, a wide variety of contaminants are found in the harbor sediment.

Presented in Table 1-1 is a comparison of typical ranged of selected chemical and physical characteristics of NY/NJ Harbor dredged material from federal navigation channels and private berthing areas to NY and NJ soil cleanup standards. As illustrated in this table, nearly all this dredged material from the NY/NJ Harbor exceeds NY and NJ soil cleanup standards. This implies that alternative disposal options must be developed for this dredged material. Decontamination and beneficial use of the sediment is one component of an overall dredged material management solution for the NY/NJ Harbor.

Table 1-1

Comparison of Typical Ranges of NY/NJ Harbor Federal Navigation and Private Berthing Maintenance Material to NY/NJ Soil Standards

Selected Chemical and Physical Characteristics	Typical Range NY/NJ Harbor Federal Navigation Sediment[1]	NY Recommended Soil Cleanup Standards[2]	NJ Residential Soil Cleanup Standards[3]
Dioxins/Furans (pg/g)			
2,3,7,8-TCDD	0-529	—	—
TCDD/TCDF TEQ	61-224	—	—
Total Polychlorinated Biphenyls (mg/kg)	0.05-3.32	1.0	0.49
PAHs (ug/kg)			
Anthracene	233-57,500	50,000	10,000,000
Benzo(a)anthracene	151-23,400	224	900
Benzo(a)pyrene	214-19,400	61	660
Chrysene	175-23,500	400	9,000
Fluoranthene	233-57,500	50,000	2,300,000
Total PAHs	2,000-306,000	—	—
Pesticides (ug/kg)			
4-4'-DDD	0.1-2,070	2,900	3,000
4-4'-DDE	2-250	2,100	2,000
Metals (mg/kg)			
Arsenic	4-97	7.5	20
Cadmium	0.2-73	1	39
Lead	17-580	Site Bkgrnd	40
Mercury	0.2-13.6	0.1	14
Nickel	10-870	13	250
Silver	0.15-16	Site Bkgrnd	110
Zinc	41-625	20	1,500
Grain Size Distribution			
Sand (>0.0625 mm)	4% - 28%	—	—
Silt (0.0039 to 0.0625 mm)	36%-84%	—	—
Clay (<0.0039 mm)	12%-36%	—	—

1 Reference for dioxins/furans, total polychlorinated biphenyls, polynuclear aromatic hydrocarbons, pesticides, herbicides and metals: Reiss, 1999. Reference for grain size distribution: PANY/NJ, 1996

2 Reference: NYDEC, 1994

3 Reference: NJDEP 1999

2. SEDIMENT WASHING TECHNOLOGY

2.1 BACKGROUND

The BioGenesis^{SM} Sediment Washing Technology is an innovative, emerging technology that has been shown in bench and pilot studies to be able to remove organic and inorganic contaminants such as dioxins/furans, polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), pesticides, herbicides, and heavy metals from a broad range of sediment particle grain sizes. (BioGenesis, 1998). The technology is designed to overcome the limitations of conventional soil washing methods that have difficulty in decontaminating silt and clay mixtures. (FRTR, 1997).

In 1993, the BioGenesis^{SM} Sediment Washing Technology was first tested at bench-scale under the sponsorship of Environment Canada's Wastewater Technology Centre. Prior to that, testing of BioGenesis's Soil Washing Technology under the EPA Superfund Innovative Technologies Evaluation (SITE) Program indicated a technology needed to be developed for treating fine-grained material in sediments. Starting in 1995, the technology was evaluated under the WRDA Program. Additional bench-scale testing has been performed for the State of Michigan, Department of Environmental Quality. Table 2-1 presents a summary of the bench-scale testing conducted to date. (BioGenesis, 1998).

2.2 NATURE OF THE SEDIMENT DECONTAMINATION PROBLEM

Natural sediments consist of a variety of components dispersed across a spectrum of particle grain sizes. These components include aluminosilicate minerals, aluminosilicates, quartz, hydrous oxides of aluminum (Al), iron (Fe), and manganese (Mn), as well as various reactive and refractory (i.e. resistant to further breakdown) organic carbon components *(Chester, 1990)*. In addition to the discrete oxides (e.g., Al-oxides) and organic solids (e.g., small organisms, dead plant and animal residues), many of the sediment particle surfaces are 'coated' with hydrous Mn and Fe oxides and/or organic substances (Szalòki et al., 1999). In turn, these hydrous Mn and Fe oxides and organic substances have a strong tendency to scavenge (i.e. attract) other chemical species. This scavenging process is an important mechanism for accumulation and transport of

Table 2-1

Summary of BioGenesis^{SM} Sediment Washing Process Bench-Scale Testing

Test Designation	Date	Sponsor	Contaminants	Matrix	Grain Size Distribution of BioGenesis^{SM} Technology Tests				Principal Results and Interpretation of BioGensis^{SM} Testing		
					% Gravel (>2,000 microns)	% Sand (75-2,000 microns)	% Silt (35-75 microns)	% Clay (1-35 microns)	Result	Interpretation	Conclusion
SITE	11/92	EPA SITE PROGRAM	TRPH	Crude oil in sandy soil	13	76	6	5	1. High contamination of TRPH cleaned from sandy soil (85 to 95%) 2. Weathered organics on fines resistant to cleaning 3. Residual biodegradation of TRPH proved	a. Aeration with chemicals is efficient for larger grain sizes.	Additional technology is needed for fines.
SEDTECH	3/93	Wastewater Technology Centre, Canada	PAHs	Wood treating waste in Thunder Bay Harbor sediments	0	0	18	82	4. Heavy concentration of PAH cleaned from fines (90 - 94%). 5. Partial removal of metals observed.	b. Collision technology validated.	First proof that fines can be cleaned with washing.
BNL 1	10/95	WRDA EPA Region 2 DOE-Brookhaven	PAHs, PCBs, dioxins, metals	NY/NJ Harbor sediment	0	19	35	46	6. Use of polymer as a separation aid interfered with analytical testing for organics. 7. High organic level required preprocessing.	c. Eliminate polymer usage. d. Organic material must be fractionated prior to desorption using collision impact.	Additional test validation needed to demonstrate removals from high biomass sediments.
BN 2	2/97	WRDA EPA Region 2 DOE-Brookhaven	PAHs, PCBs, dioxins, metals	NY/NJ Harbor sediment	3	68	26	3	8. Particles larger than 400 mesh cleaned at 85 - 99%, including PAHs, PCBs, dioxins/furans, and metals.	e. Organic/inorganic contaminant removal demonstrated on silt. f. Further demonstration needed for fines.	Effectiveness is validated on NY/NJ Harbor sediment levels of contamination.
Detroit 1	4/97	EPA GLNPO, Mich. DEQ	Metals, PCBs	Trenton Channel Detroit River sediments	0	11	76	13	9. 50 - 60% of high inorganic contamination removed.	g. High iron oxide levels interfere with cleaning. Remove iron/iron oxide prior to collision step.	Additional test validation needed to verify solution to iron oxide removal.
BNL 3	8/97	WRDA EPA Region 2 DOE-Brookhaven	PAHs, PCBs, dioxin, metals	NY/NJ Harbor sediment	0	14	33	53	10. Cavitation effective in fractionating organic material prior to collision. 11. Samples exceeded laboratory holding time prior to extraction.	h. Samples for organic testing must be extracted without delay to prevent readsorption of organic contamination. i. In the field, liquid-solid separation must be timely for the same reason.	Reprocess to desorb the contaminants resorbed during long holding time and to test the effect of repetitive processing.
BNL 4	11/97	WRDA EPA Region 2 DOE-Brookhaven	PAHs, PCBs, dioxin, metals	NY/NJ Harbor sediment	0	14	33	53	12. High chemical concentrations impeded cavitation and collision processes. 13. Reduced chemical concentration, cavitation during preprocessing, then collision produced extraction percents of about 90%.	j. Preprocessing, collision, cavitation, and chelation effectiveness revalidated on small grain size materials.	Process is ready for large-scale field demonstration and selection of sediment handling, liquid-solid separation, and water treatment technologies.
Detroit 2	11/97	EPA GLNPO, Michigan DEQ	Metals, PAHs	Trenton Channel Detroit River sediments	1	8	54	37	14. Average metal extraction - 78% on RCRA and Priority Pollutant metals. Average PAH removal - 88%.	k. Preprocessing, collision, cavitation, and chelation effectiveness revalidated on small grain size materials.	Readiness for demonstration reconfirmed.

particle-reactive (i.e. preferentially associating to the particles rather than staying in the water phase) contaminants in an urban riverine/estuarine aquatic system, because contaminants such as PAHs, PCBs, dioxins, and heavy metals have a strong affinity for these solid particles. This affinity is expressed by the term *partitioning coefficient (K_d)*, which defines the ratio of the concentration of a constituent on particles (µg/g) to that "dissolved" in solution (µg/cm^3). For example, for PCBs and heavy metal contaminants, K_d values are ~ 10^4 to 10^7 cm^3/g (Achman et al., 1996; Feng et al., 1999). In practical terms, this means that such contaminants prefer to be associated with solid surfaces by a factor of 10,000 to 10,000,000 instead of remaining in the water phase. This example illustrates the effort that must be expended to remove these contaminants.

Thus, contaminated sediment is created when excessive industrial chemicals or other contaminated material from land-based point and non-point sources, and atmospheric fallout, are released into the water column. These contaminants are then scavenged by suspended particles, which include both organic and inorganic particles, coalesce with other suspended particles, and subsequently settle to the bottom to form in-place contaminated sediment.

BioGenesis uses the following model to describe contaminant distribution at the particle level. This is the basis for the design of the individual processing steps in the BioGenesis^{SM} Sediment Washing Technology.

> *During the sediment formation and aging process, naturally occurring organic material (NOM), such as humic substances and living microorganisms of various types (biota), colonize surfaces of suspended particles (McMahon and Chapelle, 1991; Green et al., 1993). This complex coating is termed the "biofilm" by BioGenesis. The sediment formation process continues as additional organisms and NOM accumulate on the particle.*
>
> *Both organic and inorganic components (e.g., NOM, biota, ligands, and Fe-, Mn-oxides) in suspended particles can adsorb or scavenge various chemical species including organic and inorganic contaminants from the water column by organic complexation and/or forming metal oxides (Chester, 1990; Trefry et al., 1996; Sañudo-Wilhelmy et al, 1996). The amount of contaminants in organic and inorganic phases depends on their*

partitioning and kinetics in these two phases, as determined by their physical and chemical characteristics (Olsen et al., 1982; Li et al., 1984; Feng et al., 1999). Thus, the task of decontamination involves disaggregating the cohesive structure of the sediments, stripping/shearing the various organic components including biota, biofilm and associated contaminants, removing metal contaminants from inorganic phases in the solid sediment particle, and subsequently removing the "clean" sediment particle from the resulting slurry via liquid/solid separation.

2.3 WASHING TECHNOLOGY APPLIED TO ESTUARINE SEDIMENTS

As described above, contaminants are scavenged by the suspended particles in the water column during transport, and then removed from the water column to the bottom sediments when the particles settle due to gravity. Thus, BioGenesis considers that the nature of these base materials (e.g., organic substances and hydrous oxides) holds the key to contaminant binding within these complex particles. In theory, the more specific surface area the particle has, the more contaminants that particle can adsorb. In other words, the amount of contaminant that can be adsorbed is related to the size of individual soil particles (i.e., grain size) and the attendant surface area, i.e., more contaminant can be adsorbed to fine particles than to coarse particles.

In any complex soil mixture, there is a range of grain sizes resulting in a wide range of surface areas. For example, one cubic inch of sand and gravel (i.e., coarse particles) having grain sizes between 1/8 and 1/2 inch diameter has approximately 1 to 2 square feet of surface area. One cubic inch of fine silt and sand with grain sizes from 150 micrometers up to 1/8 inch contains approximately 600 to 1,000 square feet of surface area. One cubic inch of silt/clay (i.e., fine particles) with grain sizes from 1 micrometer to 150 micrometers can have as much as 12,000 square feet of surface area. (Thibodeaux, 1996).

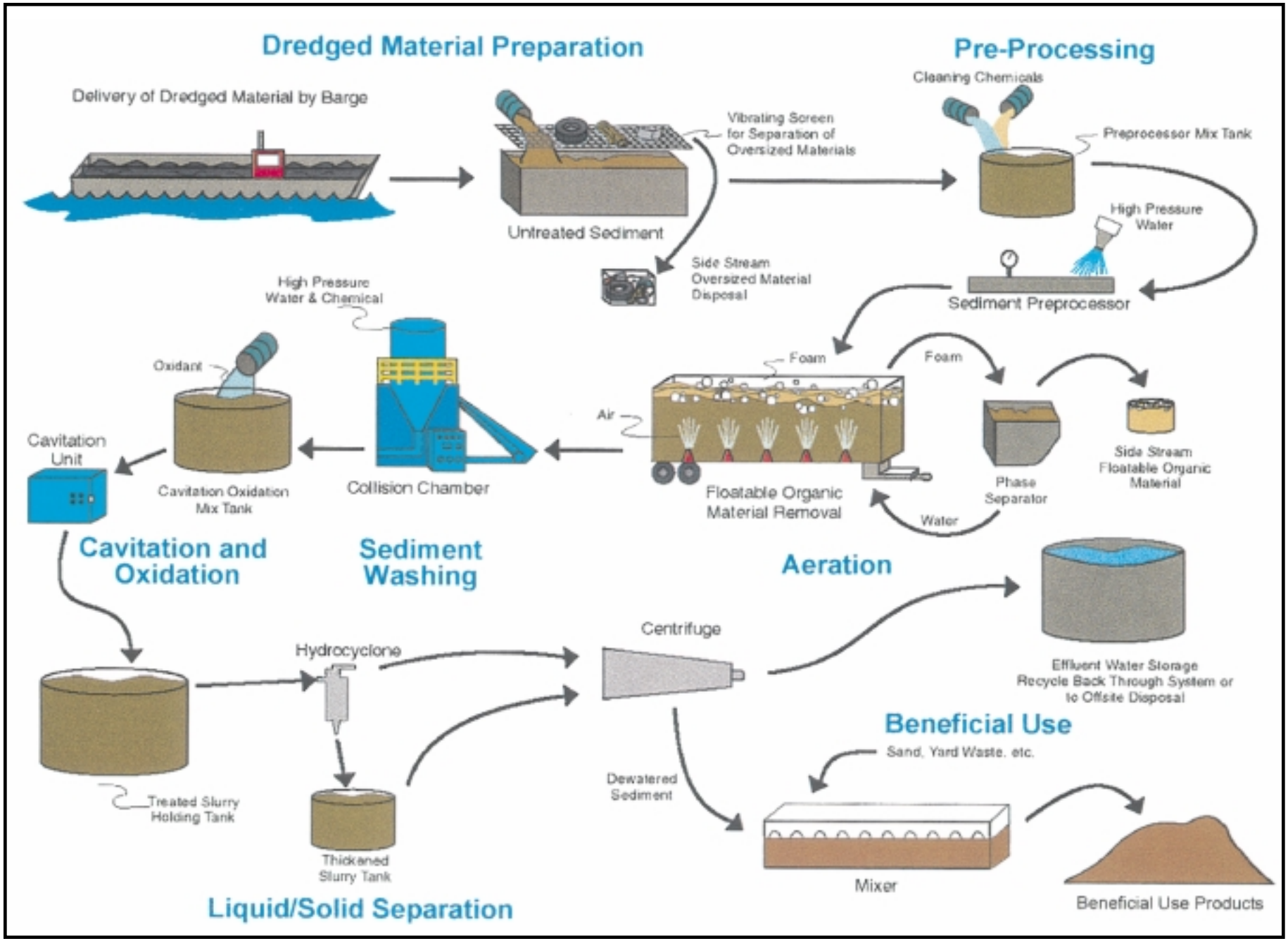
The larger surface areas of finer-grained particles indicate that with a mix of different particle sizes, by just simple size separation it should be possible to "clean" large-sized soil particles. But that approach does not apply to sediment because sediment is not necessarily a mixture of large and small grain sizes. Instead, it is typically a more uniform mix of silt (3.9 to 63 micrometers) and clay (<3.9 micrometers). These small particle sizes create extremely large surface areas typically coated with organics/organisms, which require cleaning. Further, the

presence of organic matter in the sediment enhances a stronger affinity or binding of both inorganic and organic contaminants to the fine grained particles such as silt and clay (Achman et al., 1996; Hirschberg et al., 1996; Feng et al., 1998).

2.4 THE BIOGENESIS^{SM} APPROACH TO SEDIMENT WASHING TECHNOLOGY

The BioGenesis^{SM} Sediment Washing Technology is designed to decontaminate fine-grained (silt- and clay-size) particles, by isolating individual particles and removing their sorbed materials, biota, and biofilm coatings. The process has been designed to use a five step treatment approach to achieve particle isolation and contaminant removal. A schematic of the pilot-scale BioGenesis^{SM} Sediment Washing Process is illustrated in Figure 2-1. The following is a description of the BioGenesis^{SM} Sediment Washing Process:

> *In Step 1, the sediment pre-processor uses physical action to disaggregate sediment particles from each other, and to separate the loosely-associated material from the biofilm-coated particles. The result is that clumped particles are disaggregated into the sediment slurry. These resulting finer particles are suspended in the water phase. In addition, NOM is fractionated and transferred to the water phase. Biofilm still coats the solid particles. Proprietary specialty chemicals are added prior to the pre-processor to prepare the solids for decontamination by decreasing the affinity among contaminants, solids, and organic matter.*
>
> *Immediately following pre-processing, Step 2, aeration, removes floatable material which was segregated to the water phase.*
>
> *In Step 3, collision impact forces (physical action) are applied to the isolated particles in the collision chamber to strip the biofilm layer from the solid particles and also transfer it into the water phase. After Step 3, contamination that was sorbed to the individual solid particles as well as the biofilm has been transferred to the water phase.*
>
> *Step 4 of the BioGenesis^{SM} Sediment Washing Process is the destruction of the organic contaminants and NOM, which have been removed from the sediment particles. The*



00P-0922-2

FIGURE 2-1 BIOGENESIS[SM] SEDIMENT WASHING PROCESS

destruction is accomplished through cavitation and oxidation. Immediately after the cavitation/oxidation step, the slurry consists of:

- Washed solid particles.
- *Residual organic materials in the aqueous phase that may still contain some organic and inorganic contaminants.*
- *Inorganic contaminants in the water phase.*
- *Water that contains the majority of contaminants (primarily inorganic constituents) desorbed from sediment solids and organic material.*

At this stage, the slurry is ready for Step 5 liquid/solid separation, which results in a decontaminated solids fraction and a liquid fraction that contains inorganic and organic contaminants, NOM, and residual sediment particles. Unless liquid/solid separation is performed shortly after Step 4, the contaminant partitioning process will reinitiate between the cleaned solids and the contaminant-enriched liquid. This means that any remaining organic and inorganic contaminants, which were just removed from the sediments, are candidates to be readsorbed/scavenged onto the cleaned solids/suspended particles, and subsequently settle along with the suspended particles due to gravity. Thus, the cleaning process is reversible, to a certain extent, with the reversal being caused by the particle-reactive characteristics of these contaminants.

3. PILOT DEMONSTRATION PROJECT ACTIVITIES

3.1 PROJECT PLANNING

3.1.1 Project Plans and Documents

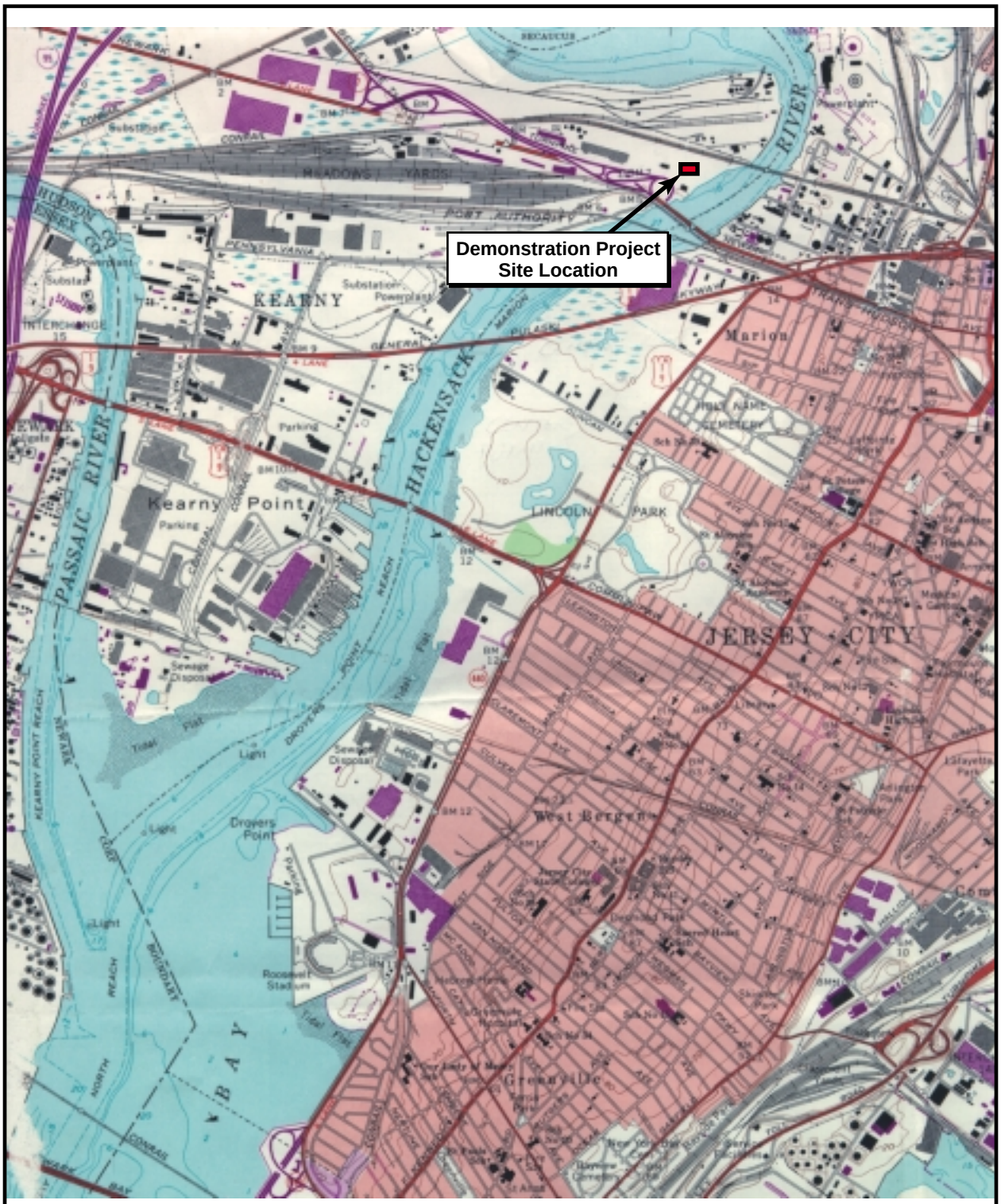
The Pilot Demonstration Project was conducted in accordance with the approved *Work Plan for the BioGenesis Sediment Decontamination Demonstration Project, New York/New Jersey Harbor,* (WESTON, 1999) herein referred to as the Work Plan. The Work Plan was approved by BNL on 25 February 1999. Included as appendices to the Work Plan are the project Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HASP).

The QAPP was prepared by Brookhaven-Rensselaer Environmental Partnership (BREP) as a generic QAPP for all technology demonstrations under the WRDA Sediment Decontamination Demonstration Project. Initially, this QAPP was prepared for the WRDA Program bench-scale testing efforts. It was revised in August 1996 for the pilot-scale (demonstration) testing. (BREP, 1996).

The HASP was prepared by WESTON in October 1998, in accordance with 29 CFR 1910.120(b) specifically for the Pilot Decontamination Demonstration Project. (WESTON, 1998). The HASP meets the currently Occupational Safety and Health Administration (OSHA), EPA, and National Institute for Occupational Safety and Health (NIOSH) regulations and guidelines. All site activities were performed in accordance with the HASP. A copy of the HASP was maintained and updated onsite throughout the project, and was read and signed by all site workers prior to commencing site activities.

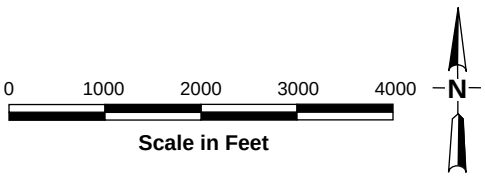
3.1.2 Site Selection

The Pilot Demonstration Project was conducted from November 1998 through March 1999 at the former Kopper's Coke/Seaboard Brownsfield Site, located on the Hackensack River at 1 Fish House Road, in Kearny, New Jersey (See Figure 3-1). Activities onsite included mobilization



Source: U.S.G.S 71/2 Minute Quadrangle
Jersey City, NJ-NY
Photorevised 1981

Quadrangle Location



Scale in Feet

99P-2260-1

FIGURE 3-1 SITE LOCATION MAP

and construction in November 1998 through January 1999, operations in February through March 1999, and demobilization in March 1999. Concurrently, SK Services (East), L.C. (SK Services) was conducting remedial activities at the Kopper's Coke/Seaboard Site for the Hudson County Improvement Authority (HCIA), the property owners. These remedial activities include, among other things, the placement of stabilized dredged materials at the site to improve the existing grade for brownfields redevelopment.

3.1.3 Approvals and Permits

Approvals and permits required for the Pilot Demonstration Project were obtained with coordination from BNL and EPA, as necessary. Copies of approvals and permits are included in Appendix A. Approvals and permits included:

- **Site Agreement** – HCIA authorized the use of the Kopper's Coke/Seaboard Site for the Pilot Demonstration Project, in a letter dated 11 September 1998.
- **Stream Encroachment Permit** – A Stream Encroachment Permit application for the onsite operations and final sediment disposition was submitted to the New Jersey Department of Environmental Protection (NJDEP) on 14 September 1998. The NJDEP approved the Stream Encroachment Permit on 18 December 1998.
- **Air Discharge Permit** – An Air Discharge Permit application for the potential release of volatile organic compounds during the operations, per NJDEP article NJAC 7:27-8.2, was submitted in September 1998. The air permit was issued by the NJDEP on 21 January 1999.
- **Zoning Permit** – WESTON applied for a Zoning Certificate for the onsite operations at the former Koppers Coke/Seaboard Site. The Hackensack Meadowlands Development Commission (HMDC) issued a Zoning Certificate for the operations, inclusive of the temporary building, on 8 December 1998.
- **Construction Permits** – WESTON applied to the Town of Kearny for necessary building permits. The building permits were approved on 6 January 1999. A Certificate of Completion and Occupancy Certification was received from HMDC on 1 February 1999.
- **Sewer Discharge Permit** – On behalf of the BioGenesis/WESTON team, SK Services applied to, and received approval from, the Passaic Valley Sewerage Commission (PVSC) for the disposal of wastewater during operations. The PVSC approved disposal of wastewater on 8 February 1999.

- **Dredging Permits** – Stratus Petroleum Corporation applied for dredging permits from the State of New Jersey and USACE – New York District. A Waterfront Development Permit (dredging permit) was received from NJDEP on 13 January 1999. A dredging permit was received from USACE on 14 January 1999. Dredging of the NY/NJ Harbor for the Pilot Demonstration Project was conducted on 15 and 16 January 1999.

3.2 PUBLIC OUTREACH ACTIVITIES

Coordination with the community in the NY/NJ Harbor region is an essential part of the WRDA Program. This includes coordinating with local officials as well as informing citizens in the community of the ongoing efforts of the program. A Sediment Decontamination Citizens Advisory Committee (CAC) has been established under the WRDA Program to serve as a focal point for community outreach activities. The CAC is coordinated by the Rutgers University Institute of Coastal Marine Sciences. The following public outreach activities were conducted as part of the Pilot Demonstration Project:

- **Local Officials** – Two meetings were held with local officials to present the plans for the Pilot Demonstration Project. The first meeting was held in August 1998 with the Hudson County Executive, and a second meeting was held in September 1998 with the Kearny, NJ Town Council.

- **HCIA** – Throughout the planning, construction, and operations of the Pilot Demonstration Project, BioGenesis, WESTON, and the WRDA Program continuously coordinated efforts with HCIA and their representatives.

- **CAC Meeting, December 1, 1998** – BioGenesis and WESTON presented the plan for the Pilot Demonstration Project to the CAC at the December 1, 1998 CAC meeting in Harrison, NJ.

- **EPA Public Outreach Event, February 22, 1999** – BioGenesis and WESTON hosted a Decontamination Technology Demonstration Event under the EPA outreach program at the pilot project site on February 22, 1999. Presentations were made by EPA, USACE, local and state officials, as well as the BioGenesis/WESTON team.

- **CAC Meeting, November 22, 1999** – BioGenesis and WESTON presented the results of the Pilot Demonstration Project to the CAC at the November 22, 1999 meeting in Kearny, NJ.

3.3 SITE ACCESS AND SECURITY

WESTON and BioGenesis controlled access to the pilot project site during normal operating hours. SK Services controlled access to the Kopper's Coke/Seaboard Site after work hours and on

weekends. Access to the pilot project site was available to WRDA team members, and onsite contractors throughout the course of the project.

3.4 SITE PREPARATION/MOBILIZATION

3.4.1 Temporary Building

A temporary building was constructed at the Kopper's Coke/Seaboard Site for the execution of the Pilot Demonstration Project. Since onsite activities were conducted in the winter of 1998/1999, the purpose of the temporary building was to provide a weather barrier against precipitation and to maintain temperatures above freezing during operations.

The temporary building was a pre-engineered, stressed membrane-type structure. The building was constructed of a pre-manufactured, interconnected, aluminum frame which was anchored into the ground. The temporary structure was approximately 90 ft wide by 130 ft long, situated on a newly constructed asphalt pad approximately 100 ft by 200 ft. The asphalt pad served as a secondary containment system for spill prevention and management during the project.

3.4.2 Office Facilities and Utilities

A temporary office trailer was utilized at the Kopper's Coke/Seaboard Site to serve as an office and field headquarters for the project team. The office trailer was hooked up to a local power source and was equipped with phone lines and a fax machine. A tool trailer and portable toilets were also brought onsite.

The power supply to the temporary building and process equipment was provided using two portable, diesel-powered generators. Heat for the temporary building was supplied using a propane-fired heater. Propane and diesel fuel were delivered to the site on a daily/weekly basis, as necessary, to provide heat to the temporary building and fuel for the generators and heavy equipment. Potable water was supplied by SK Services and stored in two storage tanks within the temporary building.

3.4.3 Equipment Mobilization/Construction

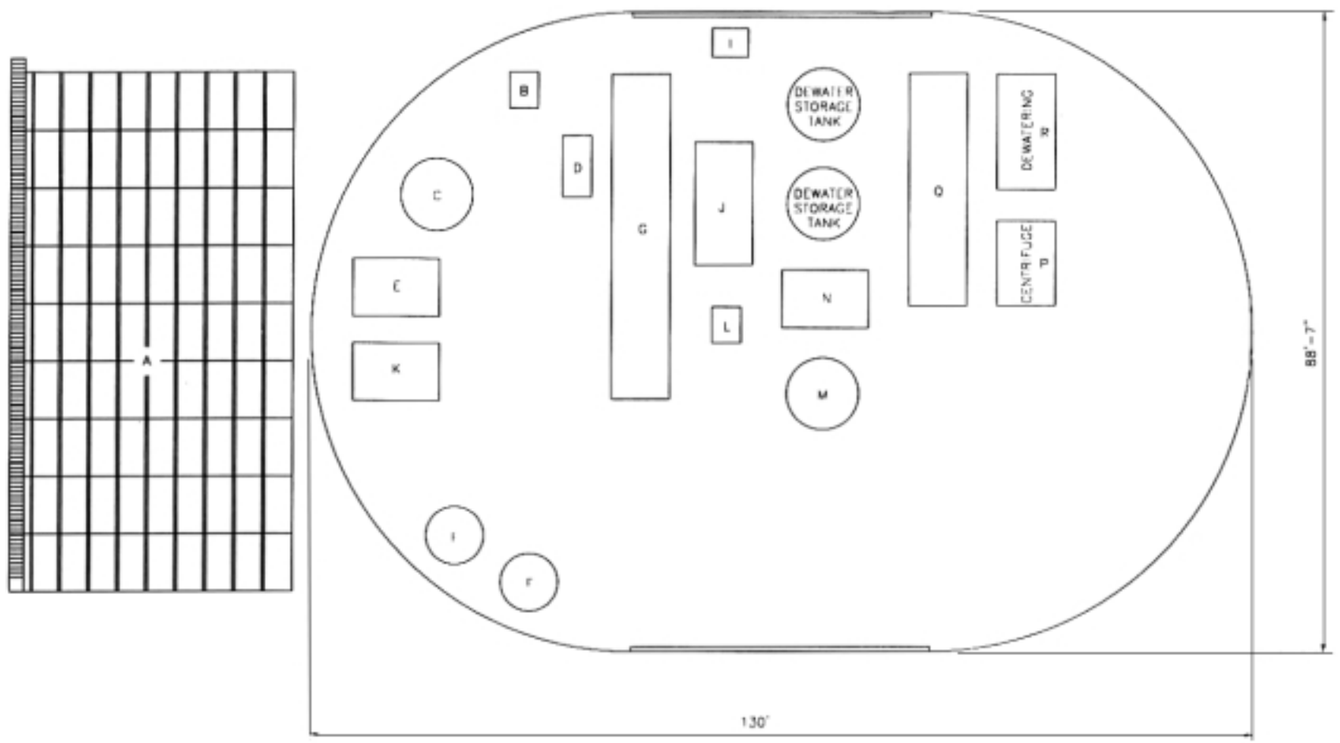
During mobilization activities, BioGenesis mobilized their pilot-scale sediment washing equipment to the Pilot Demonstration Project site. Additional equipment including storage and mix tanks, pumps, dewatering equipment, and soil mixing equipment which was rented or leased locally, was mobilized to the site as needed.

Construction of the pilot sediment treatment system involved the placement of the processing equipment within the temporary structure. Electrical hook-up of the equipment to the portable generators was conducted by licensed electricians in accordance with local electrical codes. Processing equipment was piped together using flexible hoses. The layout of the facility and a list of processing equipment are presented in Figure 3-2. A process flow diagram (PFD) with mass balance and piping and instrumentation diagram (P&ID) are presented in Figures 3-3 and 3-4, respectively.

3.5 MATERIALS HANDLING AND PREPARATION

3.5.1 Source Material Selection and Dredging

The source of dredged materials for the Pilot Demonstration Project was the Stratus Petroleum Site located in Newark, New Jersey on upper Newark Bay, lower Passaic River as illustrated in Figure 3-5. This site was selected by the WRDA Program to be representative of typical NY/NJ Harbor dredged material based on historical testing data showing elevated containment concentrations. The material was dredged on 15 and 16 January 1999 by the USACE – New York District *Marine Vessel (m/v) Hayward* in collaboration with Stratus and the WRDA Program. Approximately 800 cy of sediment at approximately 40% solids were dredged using 1-cy capacity clam-shell dredge and placed into a 1,600 cy open scow mored to the *m/v Hayward*. The dredged material scow was transported by the *m/v Hayward* to the Kopper's Coke/Seaboard Site for processing.



EQUIPMENT LEGEND	
A	RAW SEDIMENT STORAGE TANKS
B	SEDIMENT TRANSFER PUMP
C	PREPROCESSOR MIX TANK
D	PREPROCESSOR
E	PREPROCESSOR HIGH PRESSURE PUMP
F	WATER SUPPLY TANK
G	AERATOR
I	COLLISION CHAMBER FEED PUMP
J	COLLISION CHAMBER SKID
K	COLLISION CHAMBER HIGH PRESSURE PUMP
L	COLLISION CHAMBER DISCHARGE PUMP
M	CAVITATION/OXIDIZER HOLDING TANK
N	CAVITATION/OXIDIZER SKID
P	SEDIMEMT DEWATERING SKID
R	DEWATERED SEDIMENT ROLL-OFFS

5'-0" 15'-0"
0 10'-0" 20'-0"

NO.	DATE	APPR.	REVISION
B	1/14/98		ADDED THREE RAW SEDIMENT STORAGE TANKS
A	1/14/98		INITIAL ISSUE

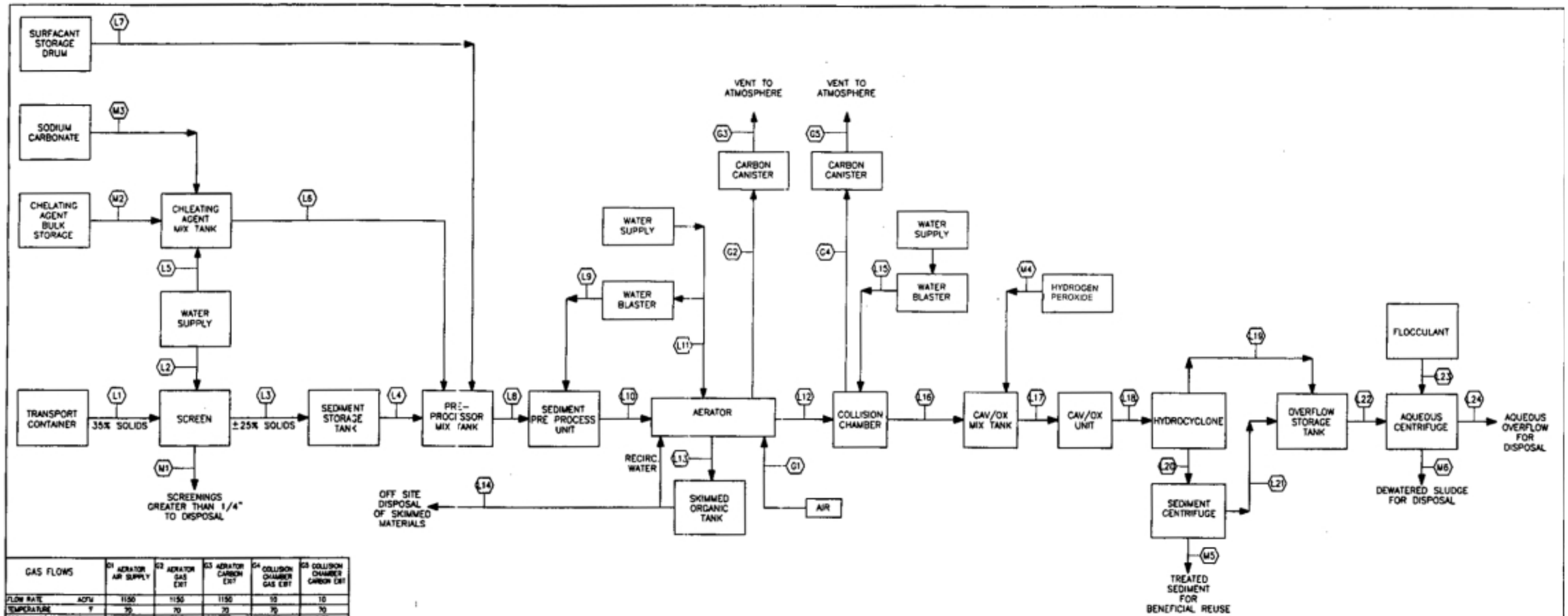
BIOGENESIS

WESTON

FIGURE 3-2
DEMONSTRATION PROJECT
EQUIPMENT ARRANGEMENT

DRAWN	DATE	DWG NO.	REV NO.
SCB	7/14/98	1000	B
SCALE 1"=10'	FILE NO. 11836001002	SHT ___ OF ___	

PLOTTED PLT. SC.
FILE NO. C:\ACADPROJ\11836011\60011003



GAS FLOWS	G1 AERATOR AIR SUPPLY	G2 AERATOR GAS EXIT	G3 AERATOR CARBON EXIT	G4 COLLISION CHAMBER GAS EXIT	G5 COLLISION CHAMBER CARBON EXIT
FLOW RATE ACFM	1150	1150	1150	10	10
TEMPERATURE °F	70	70	70	70	70
TOTAL MASS lbs./min.	86.0	86.0	86.0	0.75	0.75
COMPONENTS WT %					
AIR	100	100	100	100	100
MOISTURE	0	0	0	0	0
ORGANICS	0	0	0	0	0

SOLIDS	M1 OVERSIZED DEBRIS	M2 CHELATING ADDITIVE	M3 SODIUM CARBONATE	M4 SODIUM PERCARBONATE	M5 TREATED SEDIMENT	M6	M7
TOTAL MASS (lbs.)	299654	25.0	13.5	14.6	11116		
COMPONENTS WT %							
MOISTURE	0	0	0	0	70		
SOLIDS	100	0	0	0	30		
ORGANICS	0	0	0	0	0		
CHELATING AGENT	0	100	0	0	0		
SODIUM CARBONATE	0	0	100	0	0		
SODIUM PERCARBONATE	0	0	0	100	0		

LIQUIDS	L1 RAW SEDIMENT	L2 DILUTION WATER TO SCREEN	L3 DILUTED SEDIMENT	L4 DILUTED SEDIMENT BATCH	L5 DILUTION WATER TO CHELATING AGENT	L6 CHELATING AGENT SOLUTION	L7 SURFACTANT SOLUTION	L8 PRE-PROCESSOR SLURRY FEED	L9H PRESSURE WATER TO PRE-PROCESSOR	L10 PRE-PROCESSOR EXIT	L11 WATER TO AERATOR	L12 AERATOR EXIT	L13 SKIMMED AERATOR EMULSION	L14 SKIMMED ORGANICS
VOLUME (Cu. Yd.)	511	230	730	10	0.015	0.03	0.025	10.05	6.00	16.07	2.74	18.5	0.4	0.23
(gal.)	103240	46450	147450	2020	3	4.1	5	2029	1217	3247	553	3734	78	46
TOTAL MASS (lbs.)	999434	387400	1386800	16873	25	62.5	41.7	16878	10153	26831	4612	33998	656	344
COMPONENTS WT %														
WATER	41.1	100.0	73.4	73.5	100.0	40.5	0	73.2	100.0	82.7	100.0	86.5	43.5	0
SEDIMENT	37.0	0	25.0	25.0	0	0	0	24.9	0	16.1	0	14.3	0	0
ORGANICS	1.9	0	1.4	1.4	0	0	0	1.4	0	1.0	0		43.5	77.0
CHELATING AGENT	0	0	0	0	0	40.0	0	0.13	0	0.08	0	3	4.1	7.3
SODIUM CARBONATE	0	0	0	0	0	20.0	0	0.07	0	0.04	0	3	2.1	3.8
SURFACTANT SOLUTION	0	0	0	0	0	0	100.0	0.22	0	0.14	0	3	6.8	12.1
SODIUM PERCARBONATE	0	0	0	0	0	0	0	0	0	0	0	3	0	0
FLOCCULANT	0	0	0	0	0	0	0	0	0	0	0	3	0	0

LIQUIDS	L15 H PRESSURE WATER TO COLLISION CHAMBER	L16 CHAMBER COLLISION EXIT	L17 CAV/OX SLURRY FEED	L18 CAV/OX EXIT	L19 HYDROCYCLONE OVERFLOW	L20 HYDROCYCLONE UNDERFLOW	L21 SEDIMENT CENTRIFUGE OVERFLOW	L22 TOTAL OVERFLOW	L23 FLOCCULANT	L24 AQUEOUS OVERFLOW FOR DISPOSAL
VOLUME (Cu. Yd.)	3.57	24.2	24.2	24.2	12.8	11.4	5.6	18.4		
(gal.)	1126	48	4861	4861	2561	2300	1138	3718		
TOTAL MASS (lbs.)	8386	42487	42502	42502	21455	20847	9729	31384		
COMPONENTS WT %										
WATER	100.0	86.1	86.1	86.1	97.9	80.0	91.4	93.9		
SEDIMENT	0	10.9	10.9	10.9	2.1	20.0	6.6	4.1		
ORGANICS	0	0	0	0	0	0	0	0		
CHELATING AGENT	0	0	0	0	0	0	0	0		
SODIUM CARBONATE	0	0	0	0	0	0	0	0		
SURFACTANT SOLUTION	0	0	0	0	0	0	0	0		
SODIUM PERCARBONATE	0	0	0.03	0	0	0	0	0		
FLOCCULANT	0	0	0	0	0	0	0	0		

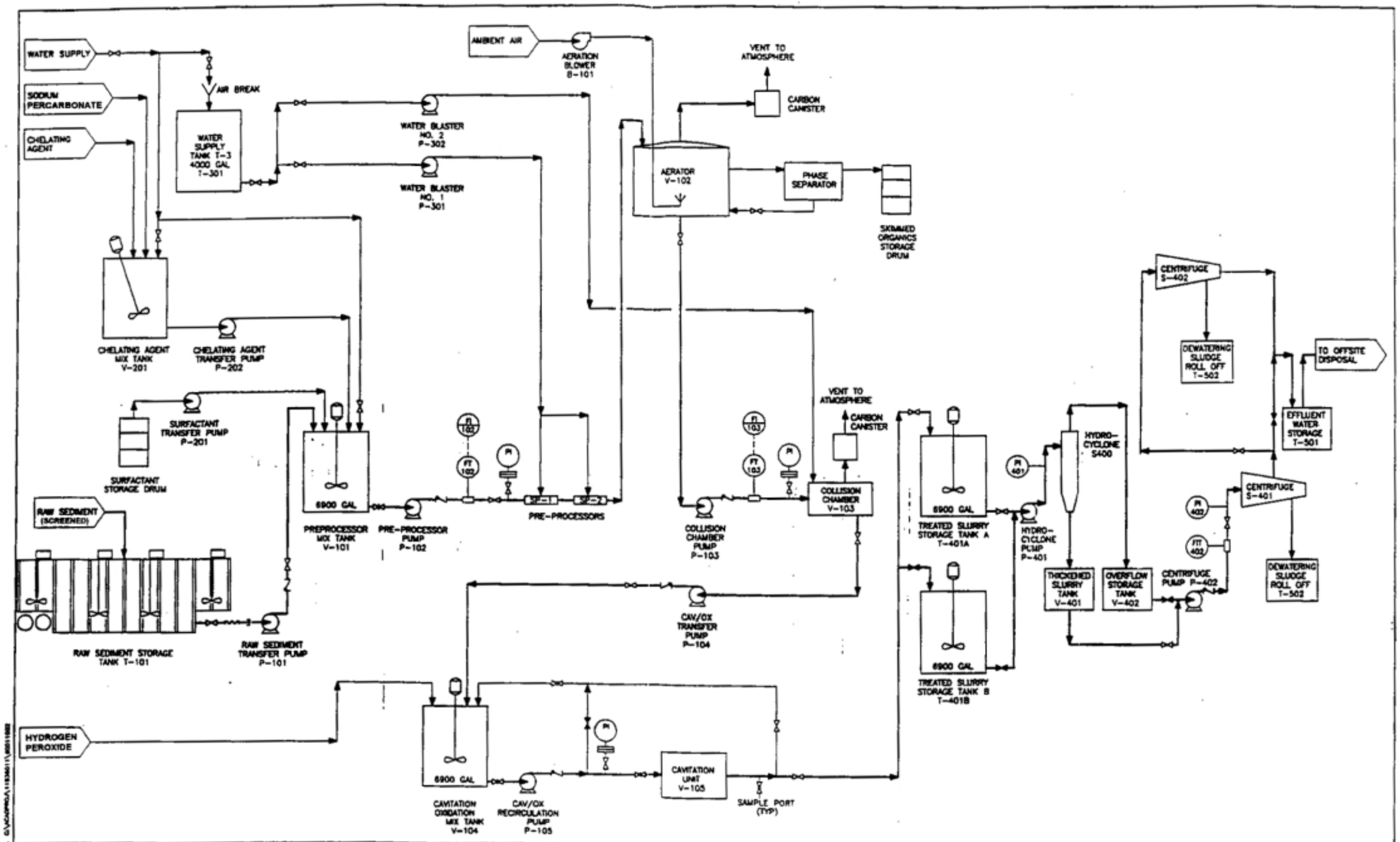
BIOGENESIS

WESTON

A	6/9/97	INITIAL ISSUE	

FIGURE 3-3
PROCESS FLOW DIAGRAM – MASS BALANCE

DRAWN	DATE	DWG. NO.	REV. NO.
SCB	7/01/97	101	A


WATER SUPPLY
SODIUM PERCARBONATE
CHELATING AGENT
AIR BREAK
WATER SUPPLY TANK T-3 4000 GAL T-301
AMBIENT AIR
AERATION BLOWER B-101
VENT TO ATMOSPHERE
CARBON CANISTER
WATER BLASTER NO. 2 P-302
WATER BLASTER NO. 1 P-301
AERATOR V-102
PHASE SEPARATOR
SKIMMED ORGANICS STORAGE DRUM
CHELATING AGENT MIX TANK V-201
CHELATING AGENT TRANSFER PUMP P-202
SURFACTANT TRANSFER PUMP P-201
SURFACTANT STORAGE DRUM
6900 GAL
PREPROCESSOR MIX TANK V-101
PRE-PROCESSOR PUMP P-102
PRE-PROCESSORS
COLLISION CHAMBER PUMP P-103
COLLISION CHAMBER V-103
VENT TO ATMOSPHERE
CARBON CANISTER
TREATED SLURRY STORAGE TANK A T-401A
TREATED SLURRY STORAGE TANK B T-401B
HYDRO-CYCLONE S-400
HYDRO-CYCLONE PUMP P-401
THICKENED SLURRY TANK V-401
OVERFLOW STORAGE TANK V-402
CENTRIFUGE PUMP P-402
CENTRIFUGE S-402
DEWATERING SLUDGE ROLL OFF T-502
TO OFFSITE DISPOSAL
EFFLUENT WATER STORAGE T-501
CENTRIFUGE S-401
DEWATERING SLUDGE ROLL OFF T-502
RAW SEDIMENT (SCREENED)
RAW SEDIMENT STORAGE TANK T-101
RAW SEDIMENT TRANSFER PUMP P-101
CAV/OX TRANSFER PUMP P-104
HYDROGEN PEROXIDE
CAVITATION OXIDATION MIX TANK V-104
CAV/OX RECIRCULATION PUMP P-105
CAVITATION UNIT V-105
SAMPLE PORT (TYP)
BIOGENESIS
WESTON
B INCORPORATED SEDIMENT DEWATERING
A INITIAL ISSUE
FIGURE 3-4
PIPING & INSTRUMENTATION DIAGRAM
DP
7/03/97
100
B
NONE

Source: U.S.G.S 71/2 Minute Quadrangle
Jersey City, NJ-NY
Photorevised 1981

99P-2260-4

FIGURE 3-5 SOURCE MATERIAL LOCATION

3.5.2 Dredged Material Preparation

A large trackhoe on the site dock was used to transfer the dredged material from the scow to a roll-off container on the dock where water from the river was added to the material until the resulting mixture reached the desired solids content (approximately 32% solids). The trackhoe was used to mix the water into the dredged material, and the resulting slurry was pumped with a centrifugal pump across a shaker screen. The screen removed oversized particles greater than 1/4 inch into a separate roll-off container. Less than 1 cy of oversized material was removed from the dredged material during screening. Photographs of the dredged material preparation and screening are provided in Figure 3-6. The screened sediment slurry was transported with a vac-truck to eight 18,100-gallon capacity raw sediment mixing tanks. These tanks were each equipped with three paddle mixers to keep the sediment from settling. The eight mix tanks were homogenized by successive pumping of material from one tank to another to create one uniform sediment slurry representative of the dredged material.

Approximately 700 cy of screened dredged materials at approximately 32% solids was prepared and stored in the raw sediment mixing tanks for the Pilot Demonstration Project. A total of approximately 200 cy of excess raw dredged material at approximately 40% solids remained on the barge pending stabilization and placement at the Kopper's Coke/Seaboard Site.

3.6 MATERIAL PROCESSING

3.6.1 BioGenesis Core Processing

The BioGenesis^{SM} Sediment Washing Technology consists of four main or core processes: (1) pre-processing, (2) aeration, (3) sediment washing, and (4) cavitation/oxidation. Photographs of the four core processing steps are provided in Figure 3-7. Following the core processing, the decontaminated sediment is de-watered (liquid/solid separation) and the water is treated, recycled, or discharged. During the Pilot Demonstration Project, processing was conducted in batch mode to allow for testing of individual system components for equipment optimization. The following is a description of the core processing equipment.

Mixing with Water

Screening to 1/4 Inch

99P-2260-6

FIGURE 3-6 DREDGED MATERIAL PREPARATION

Pre-Processor

Aeration Unit

Collision Chamber

CavitationOxidation

99P-2260-7

FIGURE 3-7 BIOGENESIS CORE PROCESSING PILOT SCALE EQUIPMENT

Pre-Processor Mix Tank (V-101)

Approximately 10 cy of the untreated dredged material at approximately 32% solids was pumped from the raw sediment storage tanks to the pre-processor mix tank, equipped with an electric paddle mixer, for each batch run. BioGenesis washing chemicals, consisting of proprietary surfactants and chelating agents for metals, were mixed with the raw sediment in the pre-processor mix tank.

Pre-processor (SP-1/SP-2)

The first processing step consisted of pumping the slurry from the pre-processor mix tank through the pre-processor. In the pre-processor, high pressure water (10,000 pounds per square inch or psi) was injected through nozzles tangentially into the slurry. The purposes of the pre-processor are to thoroughly mix the washing chemicals, disaggregate clumped particles in the slurry, and fractionate the NOM coating the sediment particles and transfer them to water phase.

Aeration Unit (V-102)

In the second processing step of the BioGenesis^{SM} Sediment Washing Process, output from the pre-processor unit was directed to the 19-cy-capacity aeration unit. The aeration unit is a trailer-mounted, open-top container that is plumbed for air mixing, water/chemical addition, organic contaminant skimming, and liquid drainage. The bottom of the trailer is configured to allow up to 1,000 cubic feet per minute (cfm) of ambient air to be bubbled through the sediment slurry. During operation, the top of the aerator was covered with a tarp, and the air bubbled through the slurry was collected under a negative pressure and treated with granular activated carbon (GAC) prior to discharge. Sampling of the treated off gas was conducted in accordance with the air permit from NJDEP. The residence time of the slurry in the aeration unit was varied to determine the optimal time for contact between the sediment, surfactants, and chelating agents, and for loosening the chemical bonds between the particles and contaminants. Any floatable organics and free-phase liquids that were present in the raw sediment slurry would be separated to the top of the aeration unit where they could be removed through skimming.

Sediment Washer/Collision Chamber V-103

Following the aeration unit, the slurry was pumped to the third processing step of the BioGenesis^{SM} Sediment Washing Process, the sediment washer or collision chamber. In this unit, high pressure water (10,000 psi) is again used, this time perpendicular to the sediment flow to create collision forces to strip the remaining NOM and biofilm layer from the sediment particles and transfer them to the water phase. Following the sediment washer, the sediment slurry contained approximately 15% to 20% solids, with the contaminants desorbed from the solid phase and suspended in the liquid phase.

Cavitation/Oxidation Unit (V-105)

The slurry stream exiting the sediment washer was fed to the fourth processing step of the process, the cavitation/oxidation unit. A strong oxidant, hydrogen peroxide, was introduced into the sediment slurry before entering the cavitation system. Cavitation creates vapor bubbles in the slurry, and the implosion of the vapor bubbles in the cavitation/oxidation system results in oxidation (breakdown) of organic molecules to carbon dioxide, water, and weak acids. Following the cavitation/oxidation step, the slurry was pumped to the liquid/solid separation equipment.

3.6.2 Liquid-Solid Separation

Following core processing (Steps 1-4), the sediment slurry consists of suspended decontaminated sediment particles and dissolved/sequestered contaminants suspended in the liquid phase. A hydrocyclone (S-400) and two centrifuges (S-401/S-402) were used during the Pilot Demonstration Project to mechanically separate and de-water the decontaminated sediment particles. Photographs of the liquid/solid separation equipment are provided in Figure 3-8. Since the inorganic contaminants and residual organic contaminants were present in the water phase, dewatering could not be conducted using flocculant or chemical addition as is done with typical liquid/solid separation operations. Flocculants or similar chemicals would tend to cause dissolved contaminants to re-adsorb to the sediment particles.

Hydrocyclone and Centrifuge

Treated Solids

99P-2260-8

FIGURE 3-8 LIQUID/SOLID SEPARATION

The hydrocyclone was configured into the system to remove any large particles, i.e., sand or larger (>0.0625 mm), from the slurry to protect the balance of the centrifuge. The Stratus Petroleum material decontaminated during the Pilot Demonstration Project was relatively consistent, fine-grained material with no large particles. As a result, the hydrocyclone was not needed for this application.

A low speed, horizontal bowl, centrifuge (S-401) was used to produce post-treated solids or sediment cake with an approximate 70% solids content. The centrate from the centrifuge was collected in a temporary storage tank and was transported, to PVSC for discharge through a subcontract with SK Services. During Batch 19, a secondary high speed, horizontal bowl, centrifuge (S-402) was used to remove additional sediment particles from the centrate from the primary centrifuge.

3.6.3 Beneficial Use

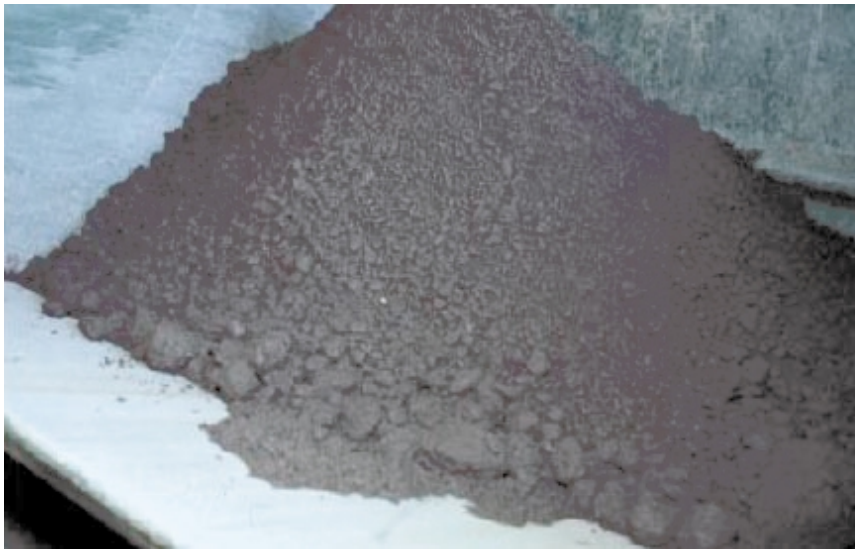
Decontaminated solids or sediment cake from the BioGenesis^{SM} Sediment Washing Process has textural characteristics similar to soil and sediment, however, it is typically void of any cohesive structure and has reduced organic content. It is planned that the final product from the process be made into a variety of beneficial use soil products so that dredged sediment can be used as a resource. This will offset decontamination processing costs, and help make decontamination a cost-competitive treatment approach for the management of dredged materials. Potential uses of the treated dredged materials include, but are not limited to, landfill cover, construction fill, fill for remediation and brownfields sites, and topsoil for residential and commercial locations.

During the Pilot Demonstration Project, as part of the Beneficial Use Evaluation, BioGenesis and WESTON demonstrated blending procedures for producing manufactured soil from treated sediment. Photographs of the beneficial use activities are presented in Figure 3-9.

3.6.4 Residual Waste Streams

Throughout the BioGenensis^{SM} Sediment Washing Process water and chemicals are added to the sediment slurry to aid in the physical process of removing NOM and contaminants from the

Blending Treated Sediment with Amendments



Manufactured Soil

99P-2260-9

FIGURE 3-9 BENEFICIAL USE

sediment particles. In addition to the product, i.e., treated sediment, from the process there are a limited number of waste streams which require additional treatment and/or disposal. These waste streams, illustrated in the PFD in Figure 3-4, are:

- Oversized material removed in the screening operation which is segregated and disposed.
- Skimmed organic material removed in the aeration unit which is disposed.
- Air bubbled through the sediment slurring in the aeration unit which is treated through GAC and discharged.
- Centrate from the primary centrifuge which is disposed as wastewater. This centrate could be treated further to remove additional sediment particles and recycled back into the process.
- Fugitive gas emissions from holding tanks and processing vessels which are treated through GAC, as necessary, and discharged.

3.7 TESTING PROCEDURES

The testing procedures implemented during the Pilot Demonstration Project were conducted in accordance with the approved project Work Plan (WESTON, 1999). A summary of the sampling and analysis, sample management, documentation, and sampling equipment decontamination procedures are included in this section.

As discussed in Section 1 of this report, the following specific objectives were established for the Pilot Demonstration Project:

1. Evaluate the effectiveness of the BioGenesis^{SM} Sediment Washing Technology to reduce contaminant concentrations in dredged material.
2. Evaluate pilot-scale equipment performance under different operating conditions and establish optimum operating conditions for the pilot equipment.
3. Collect sufficient data for mass balance calculations and Phase 2 scale-up design activities.
4. Validate pilot-scale system performance by showing data repeatability in multiple process batches.

A two task analytical testing program was developed to meet these objectives. During the first task, Pilot System Testing, test runs were performed at different operating conditions and analytical samples were collected for indicator compounds to meet objectives 1, 2, 3, and 5 as outlined previously. During the second task, Process Validation, four batches were processed at similar operating conditions and samples were collected throughout the process and analyzed for a full suite of analyses to meet objectives 1, 3, and 4 as outlined previously. Prior to conducting analytical testing, Startup/Shakedown was conducted to checkout the mechanical operations of the pilot scale processing equipment.

Samples collected during the Pilot Demonstration included sediment, solid, aqueous, and air samples according to the procedures presented in the project Work Plan, HASP, and QAPP. A summary of sample locations, including sample matrix and analytical parameters, is presented in Table 3-1. Sample locations are presented on Figure 3-6. All samples were analyzed by Quanterra Incorporated. Samples for metals, PAHs, VOCs, pesticides, herbicides, etc. were analyzed by Quanterra's Pittsburgh, Pennsylvania; Canton, Ohio; and Arvada, Colorado laboratories. Samples for dioxins/furans and high resolution PCBs were analyzed by Quanterra's Sacramento, California laboratory. Gaseous-phase samples were analyzed by Quanterra's Knoxville, Tennessee laboratory. Analytical services performed by all Quanterra laboratories used standard EPA-approved methodologies. Sampling and laboratory analytical activities were conducted in accordance with the QAPP including the collection and analysis of Quality Assurance/Quality Control (QA/QC) samples.

3.7.1 Startup/Shakedown

The purpose of Startup/Shakedown was to confirm the operational readiness of the pilot scale process equipment. During this period, all components of the process were checked for proper operation and function. The check included all monitoring devices and measuring instruments for key operational parameters such as pressure, temperatures, and flow-rate. Initial "Standard Operating Conditions" were established for Pilot System Testing. Startup/Shakedown activities were conducted in February 1999.

Table 3-1

Sampling Locations and Analytical Parameters

Sample	Location Designation	Sample Matrix	Analytical Parameters	
			Pilot System Testing	Process Validation
Individual Raw Sediment Holding Tank	**Tank 1 through 7**	sediment	PAHs, TRPH, Metals, % Moisture	None
Untreated Sediment Prior to Pre-Processor Mix Tank	**RAW**	sediment/solid/aqueous	PAHs, TRPH, Metals, % Moisture	TOC, TVS, pH, Grain Size, D/F, PCBs, PCB Congeners, Metals, VOCs, PAHs, Pests, Herbs, % Moisture
Pre-Processor Inlet	**PPI**	sediment/solid/aqueous	PAHs, TRPH, Metals, % Moisture	None
Pre-Processor Outlet/ Aerator Inlet	**PPO**	sediment/solid/aqueous	PAHs, TRPH, Metals, % Moisture	% Moisture, TOC, pH, Metals, PAHs, PCB
Grab from Tank/Aerator Outlet/Collision Chamber Inlet	**AER**	sediment/solid/ aqueous/ gaseous	PAHs, TRPH, Metals, % Moisture	TO-14 VOCs
Collision Chamber Outlet/ Cav/Ox Unit Inlet	**CCO**	sediment/solid/aqueous	PAHs, TRPH, Metals, % Moisture	% Moisture, TOC, pH, Metals, PAHs, PCB
Cav/Ox Unit Outlet/ Hydorcyclone-Centrifuge Inlet	**OXO**	sediment/solid/aqueous	PAHs, TRPH, Metals, % Moisture	% Moisture, TOC, pH, Metals, PAHs, PCB
Hydrocyclone Underflow	**HYU**	sediment	PAHs, TRPH, Metals, % Moisture	None
Hydrocyclone Overflow	**HYO**	sediment	PAHs, TRPH, Metals, % Moisture	None
Centrifuge Cake	**PSD**	solid	PAHs, TRPH, Metals, % Moisture	% Moisture, TOC, TVS, pH, Grain Size, D/F, PCB Congeners, PCBs, Metals, VOCs, PAHs, Pests, Herbs
Centrifuge Centrate	**PAQ**	sediment/solid/aqueous	PAHs, TRPH, Metals, % Moisture	% Moisture, TOC TVS, TSS, TDS, pH, WQP, TDM Grain Size, D/F, PCBs, PCB Congeners, Metals, VOCs, PAHs, Pests, Herbs
Secondary Centrifuge Sediment Cake	**SSD**	sediment	PAHs, TRPH, Metals, % Moisture	None
Secondary Centrifuge Centrate	**SAQ**	sediment/solid/aqueous	PAHs, TRPH, Metals	None

Notes:
D/F = Polychlorinated Dibenzo-p-dioxins/Dibenzofurans by SW846 Method 8290.
Herbs = Herbicides by SW846 Method 8151A.
Pests = Pesticides by SW846 Method 8081A.
PAHs = Polynuclear Aromatic hydrocarbons by SW846 Method 8270C.
PCBs = Polychlorinated biphenyls by SW846 Methods 1668M (congeners) and 8082 (aroclors).
% Moisture = Percent moisture by MCAWW Method 160.3 Modified.
Metals = Metals by SW846 Method 6020/7471A (mercury).
TDM = Total dissolved metals by SW846 Method 6020/7471A (mercury).
TDS = Total dissolved solids by MCAWW Method 160.1.
TO-14 VOCs = Volatile Organic Compounds in Air by SMCA Method TO-14.
TOC = Total organic carbon by SMCA Walkley-Black Method.
TRPH = Total recoverable petroleum hydrocarbon by MCAWW Method 418.1.
TSS = Total suspended solids by MCAWW Method 160.2.
TVS = Total volatile solids by MCAWW Method 160.4.
VOCs = Volatile organic compounds by SW846 Method 8260B.
WQP = Water quality parameters:
- Acid-insoluble Sulfide by SW846 Method 9030A.
- BOD (biochemical oxygen demand) by MCAWW Method 405.1.
- COD (chemical oxygen demand) by MCAWW Method 410.5.
- MBAS (surfactants) by MCAWW Method 425.1.
- pH by SW846 Method 9045C.
- TKN (total Kjeldahl nitrogen) by MCAWW Method 351.3.
- Total Phosphorous by MCAWW Method 365.2.

Method References:
MCAWW = "Methods for Chemical Analysis of Water and Wastes," EPA 600/4-79-020, March 1983 and updates.
SW846 = "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846," EPA, 3rd Edition, November 1986 and updates.
EPA-2 = "Compendium for Methods for the Determination of Toxic Organic Compounds in Ambient Air," EPA 600/4-84-041, April 1984.
SMCA = 90-3, Standard Methods of Chemcial Analysis, 6th Edition, D. Van Nostrand Co., Princeton, N.J., 1963.

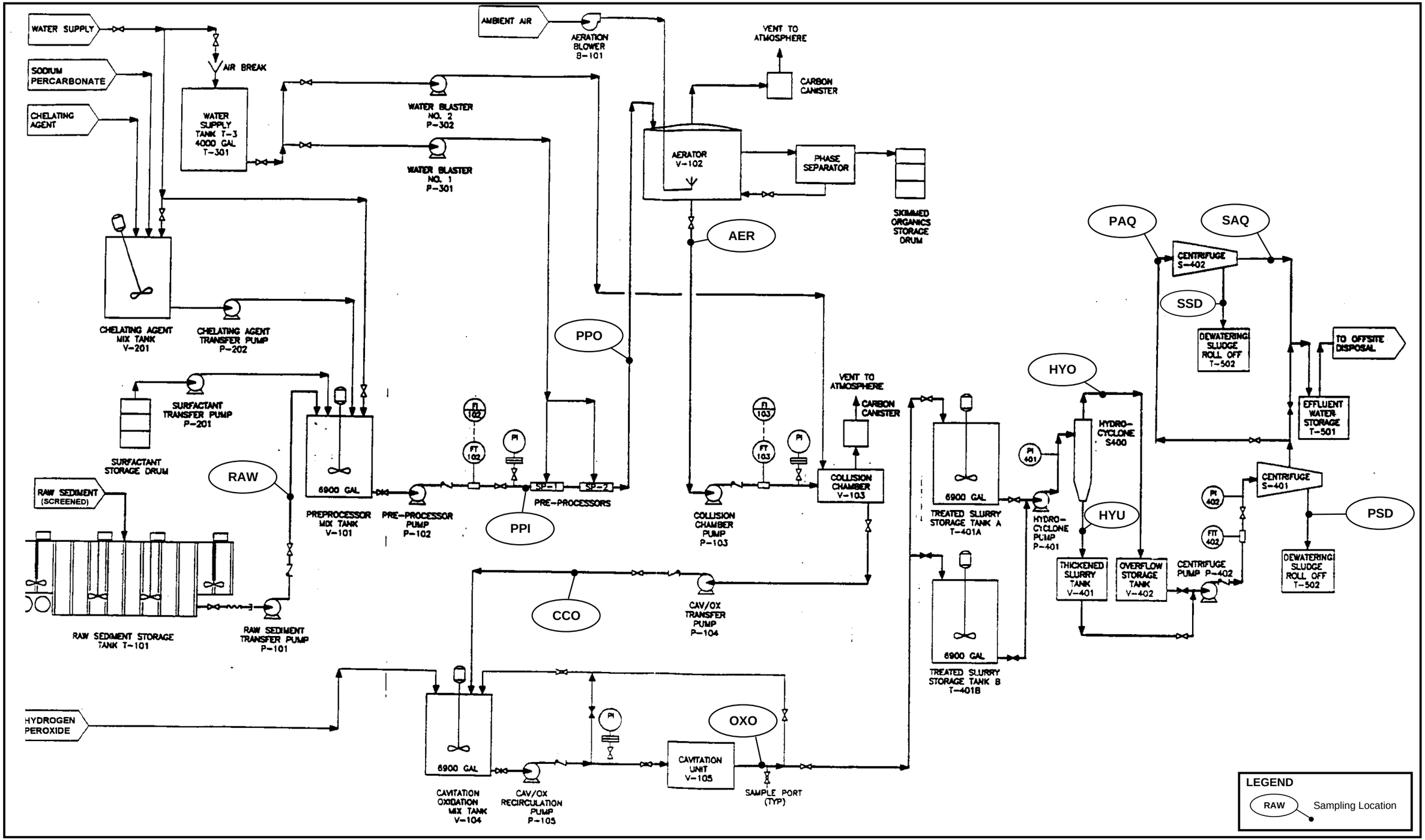


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FIGURE 3-10 SAMPLING LOCATIONS

3.7.2 Pilot System Testing

During Pilot System Testing, the critical operating conditions (i.e., flow rate, pressure, chemical addition rate, etc.) for individual processes were independently varied to assess the impact on contaminant removal efficiencies. As stated earlier, operations were conducted in a batch mode during the Pilot Demonstration Project. For each batch, one or more process variables or operating conditions were independently varied at different times, and one set of samples of the sediment slurry were collected at key locations to evaluate the specific effects of each variation. As indicated on Table 3-1, sediment samples were analyzed for indicator analyses: total recoverable petroleum hydrocarbons (TRPHs), polynuclear aromatic hydrocarbons (PAHs), and priority pollutant metals; to provide an indication of the effects on varying process operating conditions.

This focused list of organic and inorganic parameters was selected to provide sufficient data with regard to the Pilot System Testing objectives. Additional test runs were conducted during Pilot System Testing to process sediment quickly and evaluate mechanical performance of the pilot-scale equipment. No sampling was conducted during these test runs. A summary of the test batches run during Pilot System Testing and process variables evaluated in each batch is included in Appendix C, Table C-1.

During the Pilot System Testing, the performance of the following equipment was investigated:

- Pre-processor
- Aerator
- Collision Chamber
- Cavitation/Oxidation Unit
- Liquid/Solid Separation Equipment (Hydrocyclone/Primary Centrifuge/Secondary Centrifuge)

Pilot System Testing was conducted in February and March 1999. A discussion of the results is presented in Subsection 4.2.

3.7.3 Process Validation

Upon review and analysis of the data collected during the Pilot System Testing, optimum operating conditions were established to achieve the maximum operating efficiency of the pilot scale equipment. These optimum operating conditions were reviewed by BioGenesis, WESTON, and the WRDA team prior to conducting Process Validation test runs.

The determination of the optimum operating conditions is discussed in Subsection 4.2 of this report. After making the necessary adjustments to the pilot process equipment, four Process Validation batch runs were processed from 16 to 18 March 1999. Samples of the sediment slurry were collected throughout the process to validate the operation of the pilot-scale equipment. A summary of the process conditions during Process Validation is included in Appendix D, Table D-1.

During Process Validation, samples of the sediment slurry were separated into solid (SL) and aqueous (AQ) fractions, using a vertical bowl bench-top centrifuge. Each fraction was analyzed separately to determine the partitioning of the contaminants (i.e., solid phase or liquid phase). Solid, aqueous, and sediment (slurry) samples were analyzed for a complete suite of analytical parameters (see Table 3-1). The Process Validation results are presented in Subsection 4.3.

3.8 SAMPLE MANAGEMENT

QA/QC procedures identified in the QAPP were followed to ensure that the integrity of the samples was maintained, and that the samples were received at the analytical laboratories in acceptable condition for analysis. Detailed documentation, including the sample identification, the location and time the sample was collected, and the respective operating conditions, were maintained by the field QA engineer in field logs throughout the course of the Pilot Demonstration Project.

3.8.1 Sample Identification

A sample identification system was established to ensure proper tracking and interpretation of the analytical data during the Pilot Demonstration Project. The sample identification code consisted of four parts, and was structured as follows:

Sample Location – Batch Number – Run Number/Matrix – Sample Number

- **Sample Location** – A three-digit letter code indicating the specific unit location/point along the treatment process where the sample was collected. The following sample location codes were used during the Pilot Demonstration Project:

  PPI – Pre-Processor Inlet
  PPO – Pre-Processor Outlet
  AER – Aeration Unit Outlet
  CCO – Collision Chamber (or Sediment Washer) Outlet
  OXO – Cavitation/Oxidation Unit Outlet
  HYU – Hydrocyclone Underflow
  HYO – Hydrocyclone Overflow
  PSD – Primary Centrifuge Cake
  PAQ – Primary Centrifuge Overflow or Centrate
  SSD – Secondary Centrifuge Cake
  SAQ – Secondary Centrifuge Overflow or Centrate

- **Batch Number** – A two-digit number (01-50) indicating the sequential Pilot System Testing batch from which the sample was collected. During Process Validation, this part of the sample identification code is represented by the letter "V", followed by the validation batch number (1-4).

- **Run Number/Matrix** – A two-digit number (01-10) indicating the specific test run from which the sample was collected. During Pilot System Testing, for a certain number of test batches, several operating conditions were varied on the same batch. This part of the sample code differentiates variations conducted under these circumstances. During Process Validation, this part of the sample identification code was used to identify sample matrix:

  - SD - sediment slurry
  - SL - solid fraction
  - AQ - liquid/aqueous fraction
  - AIR - air samples

- **Sample Number** – A two-digit number (01-03) indicating the specific sample number collected for a certain test run and test batch. In most cases this part of the sample identification code is "01" for routine, normal samples, except in limited cases where an additional sample was collected at the same point (i.e., for duplicate or archive samples). During Process Validation, the following codes were used:

  - 01 - normal samples

- 02 - duplicate samples
- 03 - archive samples.

- Examples of sample IDs:

PPI-24-01-01	Pilot System Testing normal sediment sample collected from the pre-processor inlet during the first run of Batch 24.
OXO-V3-AQ-02	Process Validation duplicate aqueous-phase sample collected from the cavitation/oxidation unit outlet during Validation Batch 3.

3.8.2 SAMPLE EQUIPMENT DECONTAMINATION

After each sample was collected, the sampling equipment (i.e. buckets, trowels, bowls, etc.) underwent proper decontamination procedures. Decontamination of all sampling equipment used during the Pilot Demonstration Project was performed using the following procedure:

1. Wash with non-phosphate soap and potable water.
2. Rinse with potable water.
3. Methanol rinse.
4. Hexane rinse.
5. Methanol rinse.
6. Deionized (DI) water rinse.
7. Air dry.

Used decontamination fluids were minimal, and were added to the centrate from the centrifuge for disposal at the PVSC.

3.8.3 Sample Packaging and Shipment

Upon collection, each sample was wrapped in bubble wrap and packed in a cooler with bagged wet ice and sufficient packing material to prevent breakage. The coolers were securely sealed with reinforced strapping tape to prevent the cooler from opening during shipment. The lid and

drainage taps (if present) of the cooler were sealed with duct tape to prevent melted ice from leaking from the cooler during shipment. A chain-of-custody form was completed for each batch of samples and was placed in the coolers. Ice was added to the coolers in plastic bags to maintain sample temperatures at approximately 4°C. The coolers were shipped using overnight delivery to the appropriate Quanterra laboratory.

3.9 DOCUMENTATION

A record of site activities, process parameters, sampling events, and equipment adjustments was maintained by the field QA engineer on a daily basis. Each test batch conducted was recorded on an operations log, which documented flow rates, pressures, and other process-related conditions. Samples collected were also recorded on the operations log, including the sample ID, collection date, and collection time.

Safety meetings were conducted on a daily basis and recorded by the Site Health and Safety Officer (SHSO). Additionally, records of the air monitoring instrument calibration readings and field measurements were maintained by the SHSO throughout the Pilot Demonstration Project.

WESTON maintains all necessary QA/QC documents in their files in West Chester, Pennsylvania. These documents include operations logs, sampling and analytical data, chain-of-custody records, receipts, facility adjustments, correspondence, equipment inventory, and other documents produced during the Pilot Demonstration Project.

3.10 QA/QC PROCEDURES

QA/QC procedures were incorporated into the Pilot Demonstration Project to ensure the collection of usable and representative data, and to facilitate meeting the objectives of the project as presented in Section 1. Additionally, QA/QC procedures were employed to ensure that all information, data, and resulting decisions are technically sound, statistically valid (accurate, precise, and complete), and properly documented. The approach for employing the project QA/QC procedures was presented in the project QAPP (BREP 1996). The QA/QC procedures were developed to:

- Ensure adherence to the methods specified for preparation, handling, sampling, cleanup, and analysis.
- Evaluate precision, accuracy, completeness, and other QC parameters.
- Ensure that properly maintained and calibrated sampling and analytical equipment has been used in the course of the study.

3.10.1 Laboratory QC Procedures

USEPA-approved methods (see Table 3-1) were used in all analytical work for this project. The reliability and credibility of laboratory analytical procedures, and QA of analytical results, were ensured by documented calibration procedures and QC samples (duplicates, method blanks, etc.). Laboratory QC measures are provided in the project QAPP.

The analytical results were reviewed by the appropriate laboratory manager to ensure that the results are reasonable, that the appropriate QC was included in the analyses, and that all the analytical systems and instruments were in control at the time of analysis.

Some of the analytical methods used in this study, as presented in the approved QAPP, were not originally developed for marine sediments and, therefore, some method modifications were required. These modifications are documented in the analytical data packages included in Appendix F. Detection limits for all methods and analyses have been set at levels that can be achieved using standardized methods, currently available instrumentation, and the sample volumes required. These limits are appropriate for the objectives of this study, ensuring data of sufficient quality for their anticipated uses presented in the following subsection.

3.10.2 Anticipated Uses of Data

The overall objective of this Pilot Demonstration Project was to evaluate the effectiveness of the BioGenesis^{SM} Sediment Washing Process to decontaminate estuarine sediments from the NY/NJ Harbor. The specific objectives presented in Section 1, will be met by determining the extent to which contaminants in the native sediments can be removed from the sediment particles, destroyed, or immobilized. Data generated from the Pilot Demonstration Project will be used to evaluate:

- Treatment effectiveness.
- Process validation/optimization.
- Mass balance calculations.
- Composition of end product(s), effluent, and by-products.
- Unit treatment cost estimates.
- Scale-up engineering data.
- Potential environmental and occupational hazards posed by the sediment and residual wastes.

3.11 RESIDUALS MANAGEMENT

3.11.1 Oversized Material

Prior to sediment processing, the dredged material supplied for the Pilot Demonstration Project was screened to remove material greater than ¼ inch. Less than 1 cy of oversized material was recovered during the screening process consisting primarily of organic materials (leaves, branches, debris, etc.). Oversized materials collected during this screening process were stabilized using Portland cement by SK Services with the treated and excess dredged materials in accordance with the placement criteria for the Kopper's Coke/Seaboard Site.

3.11.2 Water/Wastewater Disposal

Wastewater generated during the Pilot Demonstration Project was collected in a 20,000-gallon steel frac tank throughout the course of the field program. As needed, the process wastewater was transported by SK Services under contract to WESTON to PVSC for disposal. Approximately 298,000 gallons of wastewater was generated and disposed at PVSC during the Pilot Demonstration Project. Wastewater generated during the course of the Pilot Demonstration Project, collected in tank T-501, included the following:

- Aqueous centrate from the liquid/solid separation process
- Stormwater and other residual fluids collected in the process area floor drain

- Wash water and other cleaning fluids (nominal) generated during decontamination of the process equipment and sampling equipment

3.11.3 Dredged Material Placement

The dredged material decontaminated during the Pilot Demonstration Project along with the excess dredged materials left in the barge, were stabilized with Portland cement by SK Services in accordance with placement criteria for the Kopper's Coke/Seaboard Site. The two types of material were stockpiled at the site and sampled using the Multiple Extraction Procedure, as required by the NJDEP. Summary tables of the analytical data for these samples are included in Appendix B. Analytical data packages for these samples are included in Volumes 2 through 4 of this report. The material remains stockpiled at the former Kopper's Site awaiting approval from the NJDEP and HCIA for placement.

3.11.4 Other Solid Waste

Other waste materials generated during the Pilot Demonstration Project include:

- Potentially-hazardous personal protective equipment (PPE), plastic sheeting, chemical containers, and other materials that may have contacted process streams.
- Non-hazardous construction debris and domestic trash.

Potentially-hazardous solid materials were collected during the course of the project and properly disposed by SK Services at the completion of the Pilot Demonstration Project. Non-hazardous solid materials were periodically collected by the site waste management contractor (arranged by SK Services) and transported to the local landfill.

3.12 DEMOBILIZATION

Upon completion of the Pilot Demonstration Project, all process equipment was disassembled, decontaminated, and removed from the Kopper's Coke/Seaboard Site. All rental equipment was decontaminated and returned to the appropriate vendors. The office trailer was returned to SK Services and the phone, electric, and potable water services were discontinued. The temporary building was dismantled and all areas used for the demonstration program were restored to their

original conditions. At the request of EPA and SK Services, the asphalt pad was left intact for future demonstration projects under the WRDA Program.

4. DISCUSSION OF RESULTS

As discussed previously, a two task analytical testing program was developed to meet the Pilot Demonstration Project objectives: Pilot System Testing and Process Validation. Prior to conducting analytical testing, Startup/Shakedown was conducted to checkout the mechanical operations of the pilot processing equipment. Results from each of these tasks are discussed in the following subsections.

Screened dredged material was homogenized in eight mix tanks prior to operations by successive pumping of material from one tank to another to create one uniform sediment slurry representative of the dredged material. During Process Validation, samples of each batch were collected from the Raw Sediment Storage Tanks and analyzed for a complete suite of physical properties and chemical constituents. A summary of the analytical results for the homogenized, raw dredged material is presented in Table 4-1.

4.1 STARTUP/SHAKEDOWN

During Startup/Shakedown activities, batch test runs were conducted to check all physical components of the pilot system equipment for proper operation and function to ensure operational readiness. Activities included:

1. System inspection (i.e., inspection of all equipment pumps, tanks, and mixers).
2. Mechanical checkout (i.e., running water through pilot process equipment to verify mechanical operation and pressure check for leaks).
3. Startup of pilot system equipment (i.e., running test sediment slurry through pilot process equipment).
4. Calibration of instruments (i.e., flowmeters, pressure gauges).
5. Development of initial standard operating conditions.

Based on equipment performance and visual observations, initial “standard operating conditions” were established for Pilot System Testing as discussed in the following subsection. Startup/Shakedown activities were was conducted over a period of two weeks from 18 January

Table 4-1
Raw Dredged Material Analytical Data

Sample ID:	RAW-V1-SD-01	RAW-V2-SD-01	RAW-V3-SD-01	AVERAGE[1]
Volatile Organics (ug/kg)				
Acetone	20 U	6.1 JB	5.8 JB	7.3
Benzene	5 U	5 U	5 U	ND
Bromodichloromethane	5 U	5 U	5 U	ND
Bromoform	5 U	5 U	5 U	ND
Bromomethane	9.9 U	10 U	10 U	ND
2-Butanone	20 U	20 U	20 U	ND
Carbon disulfide	5 U	5 U	5 U	ND
Carbon tetrachloride	5 U	5 U	5 U	ND
Chlorobenzene	5 U	5 U	5 U	ND
Dibromochloromethane	5 U	5 U	5 U	ND
Chloroethane	9.9 U	10 U	10 U	ND
Chloroform	5 U	5 U	5 U	ND
Chloromethane	9.9 U	10 U	10 U	ND
1,1-Dichloroethane	5 U	5 U	5 U	ND
1,2-Dichloroethane	5 U	5 U	5 U	ND
1,1-Dichloroethene	5 U	5 U	5 U	ND
1,2-Dichloroethene (total)	5 U	5 U	5 U	ND
1,2-Dichloropropane	5 U	5 U	5 U	ND
cis-1,3-Dichloropropene	5 U	5 U	5 U	ND
trans-1,3-Dichloropropene	5 U	5 U	5 U	ND
Ethylbenzene	5 U	5 U	5 U	ND
2-Hexanone	20 U	20 U	20 U	ND
Methylene chloride	5 U	5 U	5 U	ND
4-Methyl-2-pentanone	20 U	20 U	20 U	ND
Styrene	5 U	5 U	5 U	ND
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	ND
Tetrachloroethene	5 U	5 U	5 U	ND
Toluene	5 U	5 U	5 U	ND
1,1,1-Trichloroethane	5 U	5 U	5 U	ND
1,1,2-Trichloroethane	5 U	5 U	5 U	ND
Trichloroethene	5 U	5 U	5 U	ND
Vinyl chloride	9.9 U	10 U	10 U	ND
Xylenes (total)	5 U	5 U	5 U	ND
PAHs (ug/kg)				
Acenaphthene	330 U	330 U	330 U	ND
Acenaphthylene	330 U	330 U	330 U	ND
Anthracene	330 U	330 U	330 U	ND
Benzo(a)anthracene	330 U	330 U	330 U	ND
Benzo(a)pyrene	330 U	330 U	330 U	ND
Benzo(b)fluoranthene	330 U	330 U	330 U	ND
Benzo(k)fluoranthene	330 U	330 U	330 U	ND
Benzo(ghi)perylene	100 J	330 U	160 J	142
Chrysene	330 U	330 U	330 U	ND

Table 4-1
Raw Dredged Material Analytical Data

Sample ID:	RAW-V1-SD-01	RAW-V2-SD-01	RAW-V3-SD-01	AVERAGE[1]
PAHs continued (ug/kg)				
Dibenz(a,h)anthracene	330 U	330 U	330 U	ND
Dibenzofuran	330 U	330 U	330 U	ND
1,2-Dichlorobenzene	330 U	330 U	330 U	ND
1,3-Dichlorobenzene	330 U	330 U	330 U	ND
1,4-Dichlorobenzene	330 U	330 U	330 U	ND
Fluoranthene	330 U	330 U	330 U	ND
Fluorene	330 U	330 U	330 U	ND
Hexachlorobenzene	330 U	330 U	330 U	ND
Indeno(1,2,3-cd)pyrene	100 J	330 U	140 J	135
2-Methlynaphthalene	330 U	330 U	330 U	ND
Naphthalene	330 U	330 U	330 U	ND
Nitrobenzene	330 U	330 U	330 U	ND
Pentachlorophenol	1600 U	1600 U	1600 U	ND
Phenanthrene	330 U	330 U	330 U	ND
Pyrene	330 U	330 U	330 U	ND
Herbicides (ug/kg)				
2,4-D	20 U	20 U	20 U	ND
2,4,5-TP (Silvex)	40 U	40 U	40 U	ND
2,4,5-T	40 U	40 U	40 U	ND
Pesticides (ug/kg)				
alpha-BHC	1.7 U	1.7 U	1.7 U	ND
beta-BHC	1.7 U	1.7 U	1.7 U	ND
delta-BHC	1.7 U	1.7 U	1.7 U	ND
gamma-BHC (Lindane)	1.7 U	1.7 U	1.7 U	ND
Heptachlor	1.7 U	1.7 U	1.7 U	ND
Aldrin	1.7 U	1.7 U	1.7 U	ND
Heptachlor expoxide	1.7 U	1.7 U	1.7 U	ND
Endosulfan I	1.7 U	1.7 U	1.7 U	ND
Dieldrin	1.7 U	1.7 U	1.7 U	ND
4,4' - DDE	3.7	4	2.2	3.3
Endrin	1.7 U	1.7 U	1.7 U	ND
Endrin ketone	1.7	1.7 U	1.7 U	1.1
Endrin aldehyde	1.7 U	1.7 U	1.7 U	ND
Endosulfan II	1.7 U	1.7 U	1.7 U	ND
4,4' - DDD	2.2	5.5	1.7 U	2.9
Endosulfan sulfate	1.7 U	1.7 U	1.7 U	ND
4,4' - DDT	4.0	2	1.7 U	2.3
Methoxychlor	17 U	17 U	17 U	ND
alpha-Chlordane	1.7 U	1.7 U	1.7 U	ND
gamma-Chlordane	1.7 U	1.7 U	1.7 U	ND
Toxaphene	67 U	67 U	67 U	ND

Table 4-1
Raw Dredged Material Analytical Data

Sample ID:	RAW-V1-SD-01	RAW-V2-SD-01	RAW-V3-SD-01	AVERAGE[1]
PCBs (ug/kg)				
Aroclor 1016	33 U	33 U	33 U	ND
Aroclor 1221	33 U	33 U	33 U	ND
Aroclor 1232	33 U	33 U	33 U	ND
Aroclor 1242	33 U	33 U	33 U	ND
Aroclor 1248	33 U	33 U	33 U	ND
Aroclor 1254	33 U	45	33 U	26
Aroclor 1260	33 U	33 U	33 U	ND
PCB Congeners (pg/g)				
2-MonoCB	460	150	190	267
Total Monochlorobiphenyls	1,000	470	490	653
4,4'-DiCB	6,400	3,500 BE	3,700 BE	4,533
Total Dichlorobiphenyls	17,000	10,000	10,000	12,333
2,4,4'-TriCB	18,000	11,000 BE	11,000 BE	13,333
Total Trichlorobiphenyls	66,000	35,000	35,000	45,333
2,2',5,5'-TetraCB	8,400	4,800 BE	4,700 BE	5,967
3,3',4,4'-TetraCB (#77)	2,300	1,200	1,300	1,600
Total Tetrachlorobiphenyls	69,000	34,000	34,000	45,667
2,3,3',4,4'-PentaCB (#105)	4,600	2,600 E	2,400 E	3,200
2,3',4,4',5-PentaCB (#118)	8,300	5,200 BE	5,100 BE	6,200
3,3',4,4',5-Penta CB (#126)	62	29	32	41
Total Pentachlorobiphenyls	77,000	36,000	37,000	50,000
2,3,3',4,4',5-Hexa CB (#156)	910	510 E	520	647
3,3',4,4',5,5'-HexaCB (#169)	40 U	2 U	2 U	ND
Total Hexachlorobiphenyls	38,000	20,000	21,000	26,333
2,2',3,4,4',5,5'-HeptaCB (#180)	6,000	4,200 BE	4,200 BE	4,800
Total Heptachlorobiphenyls	21,000	16,000	16,000	17,667
2,2',3,3',4,4',5,5'-OctaCB	1,700	980	970	1,217
Total Octachlorobiphenyls	7,200	2,700	3,200	4,367
2,2',3,3',4,4',5,5',6-NonaCB	2,000	880	1,000	1,293
Total Nonachlorobiphenyls	2,500	1,100	1,300	1,633
DecaCB	1,400	910	910	1,073
Furans (pg/g)				
TCDFs (total)	240	140	130	170
2,3,7,8-TCDF	14	5.3	5.8	8.4
PeCDFs (total)	230	120	110	153
1,2,3,7,8-PeCDF	8.4	3.6	3.6	5.2
2,3,4,7,8-PeCDF	18	7	5.8	10
HxCDFs (total)	210	100	120	143
1,2,3,4,7,8-HxCDF	76	30	36	47.3
1,2,3,6,7,8-HxCDF	18 U	8.4	9.4	8.9
2,3,4,6,7,8-HxCDF	7.8	2.2 U	2 U	3.3

Table 4-1
Raw Dredged Material Analytical Data

Sample ID:	RAW-V1-SD-01	RAW-V2-SD-01	RAW-V3-SD-01	AVERAGE[1]
Furans Continued (pg/g)				
1,2,3,7,8,9-HxCDF	0.29 U	1.2 U	2.2 U	ND
HpCDFs (total)	360	170	190	240
1,2,3,4,6,7,8-HpCDF	260	120	140	173
1,2,3,4,7,8,9-HpCDF	9.8	4.4	1.5 U	5.0
OCDF	350	180	200	243
Dioxins (pg/g)				
TCDDs (total)	76	55	48	60
2,3,7,8-TCDD	52	37	28	39
PeCDDs (total)	13	2.8	3.5	6.4
1,2,3,7,8-PeCDD	2 U	1.1 U	2.2 U	ND
HxCDDs (total)	130	60	110	100
1,2,3,4,7,8-HxCDD	2.9	1.4 U	2.8 U	1.7
1,2,3,6,7,8-HxCDD	12	6	5.6	7.9
1,2,3,7,8,9-HxCDD	10	4.2	8.8	7.7
HpCDDs (total)	400	210	370	327
1,2,3,4,6,7,8-HpCDD	180	93	110	128
OCDD	1,800	930	1,000	1,243
TEQ (Calculated) (pg/g)	**80.3**	**49.4**	**41.3**	**57.5**
Priority Pollutant Metals (mg/kg)				
Antimony	1.6	0.26 U	0.28 U	0.62
Arsenic	14.7	11.2	8.3	11.4
Beryllium	1.1	0.76	0.56	0.81
Cadmium	3.4	2.6	1.9	2.6
Chromium	172	128	97.4	132
Copper	173	122	89.7	128
Lead	181	134	95.8	137
Nickel	43.7	30.8	22.3	32.3
Selenium	1.4	1.2 J	1.1 J	1.2
Thallium	0.3	0.21 J	0.16 J	0.22
Zinc	322	236	175	244
Mercury	2.8	3.5	3.1	3.1
Silver	3.4	1.7	1.7	2.3
General Chemistry				
Percent Solids (%)	31.3	32	32	31.8
pH (units)	7.3	7.1	7.2	7.2
Total Organic Carbon (mg/kg)	34,100	16,100	21,000	23,733
Acid-insoluble Sulfide (mg/kg)	1,360	131 U	138 U	498
Grain Size Analysis (%)				
Sand (>0.0625 mm)	6%	8%	5%	6%
Silt (0.0625 mm<, >0.0039 mm)	50%	52%	53%	52%
Clay (<0.0039 mm)	44%	40%	42%	42%

[1] Averages calculated using individual sample values and half the detection limit for samples reported as non-detect. Averages were considered non-detect (ND) if all samples were below detection limits.

U = Not detected.

J = Estimated result. Concentration below reporting limit.

B = Compound detected in blank

E = Estimated result. Concentration exceeds calibration range.

1999 through 30 January 1999. Approximately 90 cy of dredged material (nine, 10-cy batches) at approximately 32% solids were processed during the Startup/Shakedown Phase.

4.2 PILOT SYSTEM TESTING

Pilot System Testing was conducted over a period of approximately 6 weeks from 1 February 1999 through 12 March 1999. During the Pilot System Testing, the operating conditions for the pilot process were varied to investigate how equipment performance was affected by different operating conditions. This was accomplished by changing operating conditions of the key pilot process equipment to study the impact on contaminant removal efficiency. Since the contaminant removal in the process takes place at more than one location, samples from the inlet and outlet of each piece of pilot equipment (unit operation) where contaminant removal occurs were collected and analyzed for indicator compounds. The contaminant removal efficiency and the performance of the following equipment were investigated during the Pilot System Testing:

- Pre-processor
- Aeration Unit
- Sediment Washer or Collision Chamber.
- Cavitation/Oxidation Unit.
- Liquid-Solid Separation Equipment (hydrocyclone, primary centrifuge, and secondary centrifuge).

During Pilot System Testing, the contaminant removal efficiency of the overall BioGenesis^{SM} Sediment Washing Process was also investigated through two additional series of tests; one series in which chemical addition rates were varied, and one series where treated sediment was processed through the equipment twice (multiple pass testing). This testing was performed to collect economic data for full scale operations. In addition, twenty-two (22) batches were run to investigate the overall operability of the processing equipment and evaluate processing time.

Contaminant removals were more sensitive to some of the parameters tested than the others. In order to achieve the testing phase objectives in a cost-effective manner, the sampling program included analyses for indicator compounds. Samples of the sediment slurry were analyzed for

percent moisture, TRPH, PAHs, and/or metals, depending on sample location and the purpose of the unit process. Since the first three steps of the BioGenesis^{SM} Sedimentation Washing Process involve separating the contaminants from the sediment particles and sequestering the contaminants in the liquid phase, samples of the slurry (solids and liquids) collected around these process steps showed little or no reduction in concentrations. Analytical results from these sediment slurry samples were used to provide a gross indication of operating effectiveness, based on mass differences of contaminants between the baseline data and the specific run data.

A total of approximately 580 cy of dredged material at approximately 32% solids was processed in 50 batches during the testing phase. For each batch, one or more test runs were conducted depending on the time required to process one batch through the particular target piece of equipment. Table 4-2 is a summary of the process control variables that were investigated in each of the 50 batches. Operating conditions for each test run conducted within each batch are presented in Appendix C, Table C-1. The standard operating conditions determined during the Startup/Shakedown Phase were run for Batches 1 and 19 (see Table C-1). Based on the analytical results from Batch 1, the second benchmark run (Batch 19) was performed to obtain lower detection limits for some analytes of interest. A third benchmark run, Batch 31, was performed at a slightly higher oxidant addition rate for comparison to other test runs. During each test run identified in Table C-1, samples were collected across the target piece of equipment for that test run. A summary table of the analytical results for samples collected during the testing phase is presented in Appendix C, Table C-2. Analytical data packages for these samples are included in Appendix F of this report. A sample identification reference table (Sample ID compared to Laboratory ID) is provided in Appendix C, Table C-3. Results of Pilot System Testing activities are discussed in the following subsections.

4.2.1 Pilot System Testing QA/QC Review

The QA review for the Testing Phase included the evaluation of 17 analytical reports containing results for TRPHs, PAHs, PPL metals, and percent solids. A total of 132 samples were collected. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to matrix interference or analytes present above

Table 4-2

Pilot System Testing Summary

Target Equipment/Process	Operating Condition Variable/Process Control Variable	Batch Number	Total Runs
System Benchmarks	Standard Operating Parameters	1, 19 and 31	3
Pre-Processor	Sediment Flow rate	2	2
	High Pressure Water Flow Rate	3 and 4	4
	Pre-Processor and Venturi Switched	16	1
	Two pre-processors in series	38	1
Aeration Gondola	Aeration Time	5	3
Sediment Washer (Collision Chamber)	Water Flow Rate	7	1
	Sediment Inlet Flow Rate	8 and 9	3
Cavitation/Oxidation Unit	Hydrogen Peroxide Addition Rate	13 and 27 (14)	2
	Sodium Percarbonate Addition Rate	14 and 28	2
	Recycle Duration	15 and 29	6
Hydrocyclone	Sediment Flow rate	10	3
Centrifuge	Pond Depth Setting	10	3
	Centrifuge Bowl Speed	10	2
	Centrifuge Conveyor Speed	10	2
Chemical Addition Rates (other than oxidants in Cavitation/Oxidation Unit)	Chelating Agent	6, 18 and 32	3
	Surfactants	12, 17, 20 (32)	3
	Sodium Percarbonate	11 (32)	1
	Defoamer	(12 and 32)	0
Multiple Pass testing	Processed sediment was re-slurried and re-processed through the pre-processor	21 (rerun of Batch 19) and 33 (rerun of Batch 31)	2
Equipment Stressing	Standard Operating Conditions	22 through 26, 30, 34 through 37, and 39 through 50	22

the linear calibration curve, samples required dilution. For diluted samples, the reporting limits are adjusted relative to the dilution required.

The results for all samples were reviewed by the laboratory in accordance with the Laboratory QA/QC Plan and Project QAPP. Matrix spike/matrix spike duplicates (MS/MSDs), method blanks, and laboratory control samples (LCSs) were analyzed for each analytical batch in accordance with standard methods. One duplicate sample (PSD-10-08-02) was collected and analyzed during Pilot System Testing. No field blanks were collected**.** All data have been found to be compliant with the QAPP with the exception of those items noted below:

- **Sample Preservation** – All cooler temperatures were measured upon receipt at the laboratory, and met the project-required 4ºC ± 2º temperature limit, with the following exceptions: one cooler in Lot D9C040124 (13ºC), two coolers in Lot D9C030118 (8ºC and 8ºC) and two coolers in Lot D9C060116 (7ºC and 7ºC). Since the samples were collected for TRPH, PAH and metals analyses, the laboratory was directed to analyze the samples and report the results.

- **QA/QC Samples** – The majority of MS/MSD spike recoveries and relative percent differences (RPDs), as well as surrogate recoveries for the Testing Phase samples, were within Method QC limits. In the cases where recoveries fell outside of the method-specific acceptance limits, most of the excursions could be attributed to matrix interference. For those samples, the acceptable LCS analysis data indicated that the analytical system was operating within control, thus confirming that the condition is most likely due to matrix interference.

The following are analyte-specific data assessments concerning the test results for samples collected during the Testing Phase:

- **TRPHs** – The 28 day extraction time for sediment sample PSD-10-08-01 was exceeded by one day. Otherwise, there were no major anomalies associated with the TRPH samples. The data can be used as designed.

- **PAHs** – In several sediment samples, surrogates (Nitrobenzene-d5, 2-Fluorophenol, Terphenyl-d14) were detected below the control limits, and all other sample surrogates, as well as the surrogate recoveries in the associated LCSs, were within control. Thus, corrective action was not required.

- Some PAH samples were analyzed at a dilution due to the concentration of target compounds. As a result of the dilution, some sample surrogates, spikes, and RPDs were out of acceptable limits. This data has been accepted for use of evaluating performance of individual processing steps.

- **PPL Metals** – Seven (7) of the 17 analytical reports originally contained incorrect mercury data due to a problem with a laboratory standard. The problem was identified, and in accordance with corrective action procedures of the QAPP, corrected data were issued on 26 May 1999. Corrective action has been taken at the laboratory to prevent a similar event from occurring in the future.

- Some MS/MSD recoveries and RPDs were not calculated for zinc because the associated sample amounts were more than four times the spike amounts. These results have been flagged with a "NC, MSB" qualifier. This practice follows standard operating procedures.

- Method blanks in several analytical reports contained concentrations of analytes slightly above their stated reporting limits. However, in accordance with the analytical methods, corrective action was not required because the analytes in the corresponding samples were detected at 20 times greater than the method blank level. These data have been flagged with an "MBB" qualifier.

- **Percent Solids** – The "Tank 8" sample container was broken upon receipt at the laboratory. Thus, the percent solids analysis was unable to be run.

In summary, the analytical data for samples collected during Pilot System Testing activities, can be used to evaluate pilot system performance with the noted qualifiers.

4.2.2 Pre-processor (SP-1/SP-2) Testing

The pre-processor is designed to use high pressure water (10,000 psi) to thoroughly mix the washing chemicals, disaggregate clumped sediment particles in the slurry, and fractionate the NOM coating the sediment particles and transfer them to the liquids phase. The pre-processor unit is not designed to remove contaminants from the process stream. The parameters that were varied across the pre-processor included: sediment inlet flow rate (20 to 140 gpm) and high pressure water flow rate (30 to 60 gpm).

Five batches, consisting of eight test runs, were conducted to investigate operations of the pre-processor. The sediment inlet flow rate was varied in Batch 2 and the high-pressure water flow rate to the pre-processor was varied in Batches 3 and 4. Additional tests included switching the in-line positions of the 10,000 psi injection nozzles (SP-1) and venturi (SP-2) flow inhibitor (Batch 16), and positioning two pre-processors in series (Batch 38). During each run, samples were collected from the inlet and outlet of the pre-processor (PPI and PPO, respectively). Operating conditions for each run are presented in Appendix C, Table C-1.

4.2.2.1 Conclusions

In general, the analytical results of the samples collected across the pre-processor during Batches 2, 3, 4, 16, and 38 did not show any significant changes in contaminant concentrations as a function of tested operating conditions, as expected. Since variations in the tested parameters did not show significant impacts on the final product, the optimum operation conditions were established based on bench-scale data, feasibility for full-scale operations and visual observance of sediment characteristics (consistency, color, etc.). The optimum operation conditions for the pre-processor were established to be:

- A slurry flow rate of approximately 120 gpm at a inlet pressure of approximately 130 psig;
- A high-pressure water-blaster flow rate of approximately 60 gpm, at a supply pressure of approximately 10,000 psig.

4.2.2.2 Additional Observations and Recommendations

During Pilot System Testing, one operational problem was encountered with the pre-processor. The high-pressure nozzle tips within the unit repeatedly failed after only a few hours of operations. The problem was discovered to be internal wearing of the nozzle tips due to either inherent particulates in the potable high-pressure injection water, or external wearing from sediment particles. A one-micron filter was installed upstream of the water blasters to remove fine particulates, and new nozzle tips, designed to be less sensitive to external wearing, were installed. This significantly reduced the operation problems with the pre-processor.

4.2.3 Aeration Unit (V-102) Testing

The aeration unit (aerator) is a trailer-mounted, open-top container that is plumbed for air mixing, water/chemical addition, organic contaminant skimming, and liquid drainage. It is designed to remove NOM fractionated off the sediment particle surfaces during pre-processing, and floatable, non-aqueous phase liquids (NAPLs). The bottom of the trailer is configured to allow up to 1,000 cfm of ambient air to be bubbled through the sediment slurry for a variable amount of time called the aeration time.

During Startup/Shakedown activities, no floatable organics were recovered from the aeration unit. Therefore, during Pilot System Testing, the tests for the aeration unit were scaled back to one batch (Batch 5), consisting of three test runs. The total aeration time was tested for 0, 15 and 60 minutes during the three runs. Analytical results for samples collected across the aeration unit are presented in Appendix C, Table C-2. The results did not show any changes in contaminant concentrations as a function of aeration time, which is expected since no floatable organics were removed by the aerator.

4.2.3.1 Conclusions

Since no floatable organics (fractionated NOM or NAPLs) were removed during the aeration process, the aeration unit was run for a minimal amount of aeration (less than 10 minutes) in the event an un-observed slug of free-phase organics was present. Visual examination of the surface of the aerator during Pilot System Testing indicated aeration was not necessary for the pilot dredged material. However, future operations may include an aeration step as an inexpensive way to remove floatable organic material.

4.2.4 Sediment Washer (V-103) Testing

The sediment washer (or collision chamber) is designed to remove remaining NOM and biofilm from the sediment particles and suspend them in the water phase. The sediment washer uses high pressure water (10,000 psi) again, this time perpendicular to the sediment flow, to create collision forces which causes the organic material and contaminants to be stripped from the solid particles. No contaminants are removed from the process stream within this unit.

Three batches, consisting of four test runs, were conducted to determine the optimal operating conditions of the sediment washer. The parameters that were varied across the sediment washer included: sediment inlet flow rate (140 to 275 gpm) and high-pressure water flow rate to the sediment washer (45 gpm versus baseline of 60 gpm). Three test runs were conducted for different sediment flow rates (Batch 8, runs 1 & 2 and Batch 9), and one test run was conducted for a different high-pressure water flow rate (Batch 7).

In general, the analytical results of the sediment slurry samples collected across the sediment washer during Batches 7, 8, and 9 did not show any significant changes in contaminant concentrations as a function of operating conditions. This is expected since samples collected during the testing phase consisted of a slurry mixture of the solid and liquid phases and no contaminants are removed from the slurry in this process. Had the samples been split into solid and liquid fractions, it is expected that a reduction in concentrations of contaminants in the solid phase would have been observed.

4.2.4.1 Conclusions

Optimization of the sediment washer was conducted by field observation and bench-scale data. Visual observations from the testing activities indicated that the unit ran most reliably under the following conditions:

- Sediment slurry flow rate of approximately 250 gpm.
- Sediment inlet pressure of approximately 150 psig.
- High pressure water flow rate of approximately 60 gpm at approximately 10,000 psi.

4.2.5 Cavitation/Oxidation Unit (V-105) Testing

The cavitation/oxidation unit is designed to oxidize (breakdown) complex organic molecules using chemical oxidation and cavitation. Oxidants such as hydrogen peroxide (H_2O_2) and/or sodium percarbonate ($2\ Na_2CO_3 \cdot 3\ H_2O_2$) are mixed into the slurry, upstream of the cavitation/oxidation unit, following the sediment washer. Cavitation creates vapor bubbles in the slurry, and the implosion of the vapor bubbles in the unit results in oxidation of organic molecules to carbon dioxide, water, and weak acids.

Six test batches, consisting of ten test runs, were conducted to investigate the cavitation/oxidation unit. The parameters that were varied across the unit included: the hydrogen peroxide addition rate (1 to 5 gallons H_2O_2 per batch), sodium percarbonate addition rate (0 to 5 Kg of sodium percarbonate per batch), and the cavitation/oxidation operation time (30 to 120 minutes). For batches 14 and 28, hydrogen peroxide was added in addition to sodium percarbonate to test the effects of the combined oxidants. Samples were collected at the inlet to

the cavitation/oxidation unit (CCO – same as collision chamber outlet) and the outlet of the cavitation/oxidation unit (OXO). Table 4-3 is a summary of the testing conditions and sampling results for these batches.

4.2.5.1 Conclusions

During the Testing Phase, approximately 1 to 5 gallons of H_2O_2 were added per batch at 35% solution. Based on theoretical calculations, a total of 5.67 lbs of H_2O_2 would need to be added per lb of total organic carbon (TOC), in order to completely oxidize all organic carbon in the sediment. Given the TOC concentrations in the sediment, this would require 1,000 to 1,500 lbs of H_2O_2 per 10-cy-batch of sediment. During Pilot System Testing, a maximum of 1% of the theoretical amount of H_2O_2 needed to oxidize the TOC present was added (3 to 14.6 lbs H_2O_2 per Batch) due to limitations of the pilot equipment. The results presented in Table 4-3 show no consistent correlation between the oxidant doses and percent reduction. In fact, several runs showed increases in concentrations, probably due to analytical variability. The optimum operating conditions for the cavitation/oxidation unit established, based on *theoretical calculations*, were a cavitation/oxidation operation time of 60 minutes at a flow rate of approximately 150 gpm. During Process Validation, a significantly higher dosage of H_2O_2 was used (25 gallons per batch) which showed consistent reductions in organic concentrations during Process Validation (see Section 4.3).

4.2.6 Liquid/Solid Separation Equipment Testing

The liquid/solid separation equipment is designed to mechanically separate the liquids and solids from the incoming slurry. The liquid/solid separation pilot equipment consisted of a hydrocyclone (S-400) and primary centrifuge (S-401). The hydrocyclone precedes the primary centrifuge and is designed to remove the larger particles to protect the centrifuge. The dredged material for the Pilot Demonstration Project was relatively consistent, fine-grained material, with no large coarse particles, and as a result the two streams exiting the hydrocyclone were combined prior to entering the primary centrifuge. During Batch 19, a secondary centrifuge (S-402) was used to separate additional solid particles from the centrate from the primary centrifuge.

Table 4-3

Summary of Cavitation/Oxidation Test Run Results

	Standard Operating Conditions	Hydrogen Peroxide Addition Rate		Sodium Percarbonate Addition Rate		Cavitation/Oxidation Recycle Times					
	Batch 19	Batch 13	Batch 27	Batch 14	Batch 28	Batch 15			Batch 29		
	Run 1	Run 1	Run 1	Run 1	Run 1	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
Operating Condition											
H_2O_2 Addition Rate	2.4 gph	1.03 gph	1.2 gph	2.43 gph	2.4 gph	2.4 gph	2.4 gph	2.4 gph	2.4 gph	2.4 gph	2.4 gph
Recycle Time	60 min	81 min	62 min	60 min	60 min	30 min	60 min	120 min	30 min	60 min	120 min
Total H_2O_2 Added per batch	2.4 gal	1.39 gal	1.24 gal	2.4 gal	2.4 gal	1.2 gal	2.4 gal	4.8 gal	1.2 gal	2.4 gal	4.8 gal
Sodium Percarbonate Added per batch	0 Kg	0 Kg	0 Kg	5 Kg	5 Kg	0 Kg	0 Kg	0 Kg	0 Kg	0 Kg	0 Kg
Analytical Results											
Change in TRPH Concentrations [1]	11% Increase	37% Decrease	99% Increase	44% Increase	26% Decrease	45% Increase	106% Increase	38% Decrease	14% Increase	8% Increase	16% Increase
Change in PAH Concentrations [1]	43% Decrease	----[2]	49% Increase	6% Increase	14% Increase	5% Decrease	12% Decrease	4% Increase	1% Increase	4% Decrease	8% Decrease

[1] Change in concentrations between samples at the Sediment Washer outlet (CCO) and the Cavitation/Oxidation unit outlet (OXO).
[2] Detection limits were elevated due to matrix interferences.

One batch (Batch 10), consisting of ten test runs, was processed through the system for the hydrocyclone and primary centrifuge testing. The parameters that were varied across the hydrocyclone and primary centrifuge included: sediment flow rate to the hydrocyclone (49 to 61 gpm), centrifuge pond depth settings (2.6 to 4.0), conveyor speed (400 to 1,955 rpm), and the sediment flow rate to the centrifuge (37 to 67 gpm). A summary of the test runs conducted to examine the solids removal efficiency of the hydrocyclone and primary centrifuge are presented in Table 4-4 and discussed below.

The sediment flow rate to the hydrocyclone was set at 60 gpm (baseline), 49 gpm and 61 gpm (maximum achieved) for Runs 1, 2, and 3, respectively. The percent solids concentration at the hydrocyclone influent (OXO) for this Batch was 19.7%. Results from Runs 1, 2, and 3 showed increasing percent solids in the hydrocyclone underflow (HYU) as sediment feed rate was decreased.

The centrifuge pond depth is the total height of the sediment slurry column in the centrifuge, as measured along the outside edge of the centrifuge bowl. The pond depth is directly related to the bowl speed: by increasing bowl speed, the pond depth will increase. The pond depth settings are measurements of the bowl speed revolutions-per-minute (rpm), divided by 1,000. The baseline pond depth setting was 3.2 (Batch 19), resulting in 71.6% solids in the treated sediment cake (PSD). The primary centrifuge pond depth settings were varied for Run 4 (2.6) and Run 5 (4.0) and resulting treated sediment cake (PSD) had 69.2% solids in Run 4, and 68.2% in Run 5. Based on these results, variation of the centrifuge bowl speed had no significant effects on the liquid/solid separation.

The primary centrifuge conveyor speed was varied for Test Run 6 (1,380 rpm), Run 7 (400 rpm), and Run 8 (1,955 rpm). Baseline tests for Batch 19 were conducted at a centrifuge conveyor speed of 1350 rpm and, as presented above, the PSD sample had 71.6% solids. Test Runs 6, 7 and 8 data showed PSD samples with percent solids at 68.8%, 68.5%, and 66.5%, respectively. Based on these results, variation of the conveyor speed had no significant effects on the liquid/solid separation.

Table 4-4

Summary of Liquid/Solid Separation Equipment Testing

Batch-Run	Condition	Percent Solids	
Hydrocyclone Testing		**HYU (Underflow)**	**HYO (Overflow)**
10-1	Baseline Conditions - Hydrocyclone flow – 60 gpm at 40 psig, - Primary centrifuge bowl depth – 3.2 - Primary centrifuge conveyor speed – 1,380 rpm - Primary centrifuge slurry flow rate – 50 gpm	54.0%	27.7%
10-2	Hydrocyclone flow – 49 gpm at 32 psig,	57.5%	17.8%
10-3	Hydrocyclone flow – 61.2 gpm at 50 psig,	47.5%	17.5%
Primary Centrifuge Testing		**PSD (Treated Cake)**	**PAQ (Centrate)**
19	Baseline Conditions - Hydrocyclone flow – 60 gpm at 40 psig, - Primary centrifuge bowl depth – 3.2 - Primary centrifuge conveyor speed – 1,380 rpm - Primary centrifuge slurry flow rate – 50 gpm	71.6%	8.4%
10-4	Primary centrifuge bowl depth – 2.6	69.2%	9.1%
10-5	Primary centrifuge bowl depth – 4.0	68.2%	9.3%
10-6	Primary centrifuge conveyor speed – 1,380 rpm	68.8%	9.2%
10-7	Primary centrifuge conveyor speed – 400 rpm	68.5%	9.4%
10-8	Primary centrifuge conveyor speed – 1,955 rpm	66.5%	9.2%
10-9	Primary centrifuge slurry flow rate – 37 gpm	70.9%	8.4%
10-10	Primary centrifuge slurry flow rate – 67 gpm	71.2%	7.9%

The sediment flow rate to the primary centrifuge was varied for Test Run 9 (32 gpm) and Run 10 (67 gpm) versus a baseline flow of 50 gpm (Batch 19). The percent solids in the PSD samples were 70.9% in Run 9 and 71.2% in Run 10. The highest percent solids measured in all of the PSD samples presented above was from the baseline Batch 19 sample at 71.6%.

The centrate from the primary centrifuge contained solids concentrations as high as 6% solids. In order to investigate recovering additional solids, a secondary, high speed, centrifuge was used to try to remove solids from the centrate of the primary centrifuge. This unit was able to recover additional solids, however since it was a smaller unit than the primary centrifuge, a total mass of additional solids recovered could not be measured. Analytical results of the cake from the secondary centrifuge indicated higher concentrations of organics and inorganics than those in the cake from the primary centrifuge. Future operations will need to balance the volume of solids removed through higher speed centrifuges with the impact on the concentrations of the treated sediment product.

4.2.6.1 Conclusions

Based on the results of Batch 10 testing, the hydrocyclone was removed from the process configuration, due to relatively-fine nature of the sediment slurry. Optimal conditions for the centrifuge were determined to be a pond depth of 3.2, a conveyor speed of approximately 1,350 rpm, and a sediment flow rate to the centrifuge of approximately 50 gpm. The results from the high speed centrifuge indicate additional material may be recovered at higher speeds, but this material may have higher concentrations of contaminants.

4.2.7 Chemical Addition Rate Testing

Six batches, consisting of six test runs, were conducted to observe the effects of varying treatment chemical quantities, which are added to the process at the pre-processor mix tank. The operating variables consisted of the chelating agent quantity (1.5 to 3 kg per batch), sodium percarbonate quantity (2 to 4 kg per batch), defoamer quantity (1 to 2 pints per batch), surfactant quantity (1 to 2 kg per batch), and the addition of an alternate surfactant. One test was also

conducted without any chemicals being added at any stage of operation. Table 4-5 is a summary of the chemical addition rate testing.

4.2.7.1 Chelating Agent

The chelating agent is added to assist in removal of the metals from the solid phase by solubilizing the metals into the aqueous fraction of the slurry. In Batch 6, the chelating agent addition was cut in half (1.5 kg) compared to the baseline amount of 3 kg/batch. Samples were collected in Batch 6 across the cavitation/oxidation unit. The analytical data showed a decrease of only 1% in total metals concentration in the solid fraction of testing across the cavitation/oxidation unit (CCO to OXO), compared to the baseline reductions of 2% in Batch 1, and 25% in Batch 19 over the same unit. Reductions of metals concentrations in the solid fraction are interpreted as being transferred to the aqueous fraction. Since metal removal processes were not tested during the Pilot Demonstration Project, all metal constituents existing in the raw sediment were recovered in the solid cake or centrifuge aqueous stream.

In Batch 18, no chelating agents were added. Analytical data from this batch indicates a 95% decrease in total metals concentrations in the solid fraction of the slurry, throughout the entire processes (PPI to PSD), compared to a 86% decrease observed in Batch 1 and an 89% decrease in Batch 19 (both baseline conditions). Based on these results, the quantity of chelating agent could be further minimized. Additional testing will be conducted during the next phase of operations to determine the optimum addition rates.

4.2.7.2 Surfactants

The surfactants are used as cleaning agents to help remove organic contaminants from the solid fraction of the slurry stream. In Batch 12, the addition of surfactants (S-11 through S-14) were cut in half (1 kg of each compared to baseline runs of 2 kg). Analytical data collected during Batch 12 indicated a reduction in the solid fraction concentrations of TRPH of 77%, and total metals of 88% across the cavitation/oxidation unit. Analytical data collected during Batch 1 (baseline with 2 kg of each surfactant) show a reduction of only 35% TRPH and 2% total metals over the same unit. Analytical data collected during Batch 19 (second baseline run) indicated concentrations of TRPH actually increased 11% across the cavitation/oxidation unit, and the total

Table 4-5

Summary of Chemical Addition Rate Testing

Batch	Condition	Percent Reduction Across Cavitation/Oxidation Unit (CCO to OXO)		Percent Reduction Across Entire Process (PPI to PSD)	
		TRPH	Metals	TRPH	Metals
1	Baseline Conditions - Chelating Agent – 3 kg/batch - Surfactants – 2 kg/batch each - Sodium Percarbonate – 4 kg/batch	35%	2%	14%	86%
19	Baseline Conditions - Chelating Agent – 3 kg/batch - Surfactants – 2 kg/batch each - Sodium Percarbonate – 4 kg/batch	+ 11%	25%	76%	89%
6	Chelating Agent – 1.5 kg/batch	-	1%	-	-
18	Chelating Agent – 0 kg/batch	77%	88%	-	-
12	Surfactants – 1 kg/batch each	-	-	52%	88%
17	Surfactants – 0 kg/batch each	-	-	52%	88%
20	New Surfactant S-15	-	-	89%	58%
11	Sodium Percarbonate – 2 kg/batch	11%	-	-	-
32	No Chemicals	-	-	78%	67%

metals concentrations dropped approximately 25%. The reason for the increase in TRPH in the second baseline run is not clear at this time.

Batch 17 was run without the addition of any surfactants. Analytical data indicate that contaminant removal from the sediment over the entire system (sampling locations PPI to PSD) show a total reduction of 52% of TRPH, and 88% of the metals. Baseline condition runs indicate an overall process reduction of 14% of TRPH and 86% of metals in Batch 1, and a reduction of 76% of TRPH and 89% of metals for Batch 19.

A new surfactant formulation (S-15) was added to Batch 20. The resulting data for the run indicated an overall reduction of 89% of the TRPH, and 58% reduction of total metals (PPI to PSD), compared to 14% and 76% reductions in TRPH, and 86% and 89% reduction in metals in the baseline runs (Batches 1 and 19, respectively) using surfactants S-11 through S-14.

4.2.7.3 Sodium Percarbonate

Sodium percarbonate is an oxidant designed to aid in the breakdown of organics through chemical oxidation. In Batch 11, the addition of sodium percarbonate at the pre-processor mix tank was cut in half (2 kg/batch compared to 4 kg/batch in the baseline runs). Batch 11 data showed a reduction of TRPH of 11% across the cavitation/oxidation unit. Total PAH data did not provide usable data due to high detection limits caused by matrix interference during analysis. The results of Batch 1 (baseline conditions) showed a percent reduction of TRPH at 35%, which is consistent with the data observed for Batch 11. However, the results of Batch 19 (second baseline run) indicated an 11% increase in TRPH concentration over the same sampling locations. The reason for the increase of TRPH in the second baseline run is not clear at this time.

4.2.7.4 No Chemicals

In Batch 32, no chemicals (surfactants, oxidizers, etc.) were added to the system throughout the entire treatment process. Data show a 78% reduction in TRPH concentrations, and a 67% reduction of total metals from (PPI to PSD), compared to 14% and 76% reductions in TRPH, and 86% and 89% reduction in metals in baseline Batches 1 and 19. This indicates a slight increase

in removal efficiencies between Batch 32 and 19 indicating the of chemicals used in future operations may possibly be able to be decreased.

4.2.7.5 Conclusions

Much of the testing phase PAH data could not be used to determine removal efficiency because of high detection limits caused by matrix interference during laboratory analysis, as discussed in Subsection 4.2.1 of this report. For the metals data, the variance of the chelating agent quantity (Batches 6, 18, and 32) should have the most significant effects on metals transfer from the solid fraction to liquid fraction. Given the data available, no definitive conclusions on chemical dosages can be drawn. Full-scale operations will require regular adjusting/improvement of chemical addition rates to reduce needed chemicals and optimize treatment costs.

4.2.8 Multiple Pass Testing

Batch 21 involved the retreatment of processed sediment from Batch 19 to determine the effects of processing the sediment slurry twice. The centrifuge solid cake from Batch 19 was slurried with potable water and re-run one additional time at optimum operating conditions through the entire process. Overall system data indicated an additional reduction in TRPH concentrations of 52%, and an additional reduction of total metals concentrations of 41%, as compared to the initial process run (Batch 19).

In a second similar test, Batch 33 involved a second treatment of processed sediment from Batch 31. Again, the centrifuge solid cake from Batch 31 was slurried with potable water, and re-run at optimum operating conditions through the entire process. Overall system data indicate an additional reduction in TRPH concentrations of 86%, and an additional reduction of total metals concentrations of 48%, as compared to the initial process run (Batch 31). *The data indicate that higher removal percentages could be achieved through additional passes through the sediment decontamination process.*

4.2.9 Equipment Stressing Testing

A total of twenty-two (22) batches were run to process sediment quickly and evaluate pilot scale equipment performance under higher stress conditions. No analytical sampling was conducted during these batch runs. Field observations of equipment performance, including system pressures, flowrates, and equipment capacities, indicated that the equipment operated well with little mechanical difficulties. Since the equipment used during the Pilot Demonstration Project was not matched for flow rates, total processing time was limited by batch mode operations. Full-scale system design will account for continuous flow conditions with capabilities for holding surge volumes during operations.

4.2.10 Summary of Pilot System Testing Results

A total of 580 cy of dredged material in 50 batches, was processed through the BioGenesis^{SM} Sediment Washing Technology pilot equipment during Pilot System Testing. Presented in Table 4-6 is a summary of the individual process testing results. The following is a summary of the conclusions from Pilot System Testing which affect future design and operations:

- The pilot equipment operated well, with little mechanical difficulties.
- Chemical doses may be able to be decreased during full-scale operations.
- Multiple passes can achieve additional treatment and result in increased overall removal efficiencies.
- Recovery of solids can be increased using high speed centrifuges.

4.3 PROCESS VALIDATION

Process Validation was conducted over a 1 week period from March 15, 1999 through March 19, 1999. A total of 30 cy of dredged material at approximately 32% solids was processed in four batches during Process Validation. The intent was to maintain the optimum operation conditions for all batches to provide replicate results. The operating conditions for the four batches, presented in Table 4-7 and Appendix D, Table D-1, were based on the best performance criteria identified during Pilot System Testing. As discussed earlier, the only significant difference in operation conditions between Pilot System Testing and Process Validation was the amount of

Table 4-6

Summary of Pilot System Testing Results

Unit Process	Function	Testing Results/Conclusions
Screening Operations	1. Remove oversized debris greater than ¼ inch.	1. Shaker screen effective in removing oversized material. 2. Less than 1 cy of oversized material was removed from the Stratus Petroleum dredged material.
Pre-processor	1. Physically separate sediment particles from each other. 2. Begin to break up naturally occurring organic material. 3. Blend chemicals with sediment slurry.	1. Pre-processor operated as expected based on visual observations of sediment characteristics (consistency, color, etc.)
Aerator	1. Remove floatable, naturally occurring, organic material broken-up in the pre-processor. 2. Remove free-phase organic contaminants.	1. No floatable or free-phase organic materials were recovered. 2. Visual observations indicated no floatable organics. 3. Aeration to be included in future operations as an inexpensive way to remove floatable organics if present.
Sediment Washer	1. Strip the organic material and contaminants from individual sediment particles using collision forces.	1. Organic and inorganic contaminants were transferred from the solids to the liquid phase. 2. Repetitive processing through the sediment washer can achieve additional removal effectiveness.
Cavitation and Oxidation	1. Destroy complex organic compounds using oxidation and cavitation. 2. Uses oxidants such as hydrogen peroxide and/or sodium percarbonate. 3. Cavitation increases organic oxidation.	1. Effectiveness limited by the amount of oxidant that could be added during the Pilot Demonstration Project due to a limitation of the pilot-scale equipment. 2. Testing Phase sampling did not achieve repeatable results due to the low level of oxidant used. This was partially corrected during Process Validation. 3. Full-scale operations will need the ability to adjust oxidant addition rates and cavitation time.
Liquid/Solid Separation	1. Mechanically remove decontaminated sediment particles from the liquid phase. 2. No chemical precipitation or flocculation.	1. Primary low speed centrifuge produced a cake at 60-70% solids. 2. Primary centrifuge recovered approximately 72% of solid particles. 3. Secondary, high speed centrifuge could recover additional solid particles in the treated sediment cake.

Table 4-7

Process Validation Phase Operating Conditions

Batch Number Test Run Number Run/Sample Date	Optimum Operating Conditions	V1 1 3/16/99	V2 1 3/17/99	V3 1 3/17/99	V4 1 3/9/99
Unit Process/Control Variable					
Pre-Processor Mix Tank					
Total Sediment Volume (gal/batch)	1,475	1,475	1,475	1,475	1,475
Surfactant S11 (kg/batch)	1	1	1	1	2
Surfactant S12 (kg/batch)	1	1	1	1	2
Surfactant S13 (kg/batch)	1	1	1	1	2
Surfactant S14 (kg/batch)	1	1	1	1	2
Surfactant S15 (kg/batch)	0	0	0	0	0
Defoamer (pints/batch)	1	1	1	1	2
Chelating Agent (kg/batch)	3	3	3	3	3
Sodium Percarbonate (kg/batch)	4	4	4	4	4
Pre-Processor Unit					
Sediment Inlet Flow Rate (gpm)	120	123 **c**	57 **c**	114 **c**	123 **c**
Avg. Sediment Inlet Pressure (psig)	130	128	138	125	135
Avg. High Pressure Water Inlet Pressure (psig)	10,000	10,000	9,933	10,000	10,000
High Pressure Water Flow Rate (gpm)	60	60 **e**	60 **e**	60 **e**	60 **e**
Avg. Sediment Outlet Pressure (psig)	160	162	172	160	165
Aerator					
Total Aeration Time (min)	7	8	7	6	6
Total Settling Time (min)	7	9	5	7	6
Air Flow Rate (cfm)	1,000	NR-NO	NR-NO	NR-NO	NR-NO
Collision Chamber					
Avg. Sediment Inlet Flow Rate (gpm)	175	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Sediment Inlet Pressure (psig)	150	150	150	150	150
Avg. High Pressure Water Inlet Pressure (psig)	10,000	10,000	10,000	10,000	10,000
High Pressure Water Flow Rate (gpm)	60	60 **e**	60 **e**	60 **e**	60 **e**
Cavitation/Oxidation Unit					
Avg. Sediment Inlet Pressure (psig)	75	75	73	NR-NO	NR-NO
Avg. Cav/Ox Unit Pressure (psig)	130	NR-NO	NR-NO	NR-NO	NR-NO
Cav/Ox Unit Flow Rate (gpm)	400	420	420	NR-NO	NR-NO
Hydrogen Peroxide Dosage (gal)	25.0	25.0	25.0	25.0	NR-NO
Sodium Percarbonate (kg/batch)	0	0	0	0	0
Recycle Flow Rate (gpm)	150	143	164	NR	NR-NO
Cav/Ox Duration (min)	60	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge					
Sediment Flow Rate to Centrifuge (gpm)	50	NR-NO	NR-NO	NR-NO	NR-NO
Pond Depth Setting	3.2	3.2	NR-NO	NR-NO	NR-NO
Avg. Centrifuge Bowl Speed (rpm)	3200	3266	NR-NO	NR-NO	NR-NO
Avg. Conveyor Speed (rpm)	360	360	NR-NO	NR-NO	NR-NO
Centrifuge Centrate Flow Rate (gpm)	50	50	NR-NO	NR-NO	NR-NO

e = Estimated value
c = Calculated value
NR-NO = Not recorded, normal (optimum) operating conditions

oxidant added to each batch. During Pilot System Testing a maximum of 5 gallons of H_2O_2 at 35% solution was added per nominal 10 cy-batch, and during Process Validation, 25 gallons of H_2O_2 at 35% solution was added per nominal 7.3 cy batch.

Samples were collected during Process Validation throughout each process step to verify contaminant removal, evaluate repeatability of the process, and to provide additional scale-up data. Air samples were collected during the fourth (and final) batch run. Sample locations included the untreated raw sediment influent (RAW), the pre-processor outlet (PPO), the collision chamber outlet (CCO), cavitation/oxidation unit outlet (OXO), the treated sediment (PSD) and the centrate from the centrifuge (PAQ). During Process Validation activities, all slurry samples (SD) were separated using a vertical bowl, bench-top, centrifuge into solid (SL) and aqueous (AQ) fractions. These fractions were analyzed separately and the analytical results were used in a mass balance approach to determine the partitioning of contaminants in the solid and liquid phases after each processing step.

Presented in Table 4-8 are the average analytical results for the untreated raw sediment slurry (RAW-SD), the solid fraction of the untreated raw sediment slurry (RAW-SL), and the treated solids (PSD-SL). As illustrated in the table, the solid fraction of the untreated sediment slurry (RAW-SL) showed higher concentrations than the raw sediment slurry (RAW-SD) in some cases. This is most likely due to limitations in the analytical extraction methods for sediments compared to the analytical extraction methods for solids. Removal efficiencies, therefore, have been calculated for the pilot-scale results between the solid fraction of the raw sediment (RAW-SL) and the treated solids (PSD-SL).

While the objectives of the Pilot Demonstration Project did not require removal/destruction of contaminants to a specific level, the New York and New Jersey soil standards have been included in Table 4-8 for comparison. As indicated during Pilot System Testing, additional processing (i.e., retention time, chemical dosing, energy, etc) will result in a further reduction of these contaminants.

Table 4-8
Validation Phase - Average Concentrations

	RAW-SD Average[1] (Inlet Sediment)	RAW-SL Average[1] (Inlet Solids)	PSD-SL Average[1] (Treated Sediment)	Percent Removal[2]	NY Recomended Soil Cleanup Objectives[3]	NJ Residential Soil Standards[4]	NJ Non-Residential Soil Standards[4]
Volatile Organics (ppb)							
Acetone	7.3	12.3	23.3	-	200	1,000,000	1,000,000
Benzene	ND	ND	ND	-	-	3,000	13,000
Bromodichloromethane	ND	ND	ND	-	-	11,000	46,000
Bromoform	ND	ND	ND	-	-	86,000	370,000
Bromomethane	ND	ND	ND	-	-	79,000	1,000,000
2-Butanone	ND	8.5	6.4	25%	300	1,000,000	1,000,000
Carbon disulfide	ND	ND	ND	-	2,700	-	-
Carbon tetrachloride	ND	ND	ND	-	600	2,000	4,000
Chlorobenzene	ND	ND	ND	-	1,700	37,000	680,000
Dibromochloromethane	ND	ND	ND	-	-	110,000	1,000,000
Chloroethane	ND	ND	ND	-	1,900	-	-
Chloroform	ND	ND	ND	-	300	19,000	28,000
Chloromethane	ND	ND	ND	-	-	520,000	1,000,000
1,1-Dichloroethane	ND	ND	ND	-	200	570,000	1,000,000
1,2-Dichloroethane	ND	ND	ND	-	100	6,000	24,000
1,1-Dichloroethene	ND	ND	ND	-	400	8,000	150,000
1,2-Dichloroethene (total)	ND	ND	ND	-	300	1,079,000	2,000,000
1,2-Dichloropropane	ND	ND	ND	-	-	10,000	43,000
cis-1,3-Dichloropropene	ND	ND	ND	-	-	4,000	5,000
trans-1,3-Dichloropropene	ND	ND	ND	-	-	4,000	5,000
Ethylbenzene	ND	ND	ND	-	5,500	1,000,000	1,000,000
2-Hexanone	ND	ND	ND	-	-	-	-
Methylene chloride	ND	ND	ND	-	100	49,000	210,000
4-Methyl-2-pentanone	ND	ND	8.2	-	1,000	1,000,000	1,000,000
Styrene	ND	ND	ND	-	-	23,000	97,000
1,1,2,2-Tetrachloroethane	ND	ND	ND	-	600	34,000	70,000
Tetrachloroethene	ND	ND	ND	-	1,400	4,000	6,000
Toluene	ND	ND	ND	-	1,500	1,000,000	1,000,000
1,1,1-Trichloroethane	ND	ND	ND	-	800	210,000	1,000,000
1,1,2-Trichloroethane	ND	ND	ND	-	-	22,000	420,000
Trichloroethene	ND	ND	ND	-	700	23,000	54,000
Vinyl chloride	ND	ND	ND	-	200	2,000	7,000
Xylenes (total)	ND	ND	ND	-	1,200	410,000	1,000,000
Total VOCs	**7.3**	**20.8**	**37.9**				
PAHs (ppb)							
Acenaphthene	ND	ND	ND	-	50,000	3,400	10,000
Acenaphthylene	ND	ND	ND	-	41,000	-	-
Anthracene	ND	1,467	ND	42%	50,000	10,000,000	10,000,000
Benzo(a)anthracene	ND	2,433	1,600	34%	224,000	900	4,000
Benzo(a)pyrene	ND	2,433	1,633	33%	61,000	660	660
Benzo(b)fluoranthene	ND	2,133	1,400	34%	11,000	900	4,000
Benzo(k)fluoranthene	ND	1,700	1,267	25%	11,000	900	4,000
Benzo(ghi)perylene	142	1,530	927	39%	50,000	-	-
Chrysene	ND	2,767	1,767	36%	4,000	9,000	40,000

Table 4-8
Validation Phase - Average Concentrations

	RAW-SD Average[1] (Inlet Sediment)	RAW-SL Average[1] (Inlet Solids)	PSD-SL Average[1] (Treated Sediment)	Percent Removal[2]	NY Recomended Soil Cleanup Objectives[3]	NJ Residential Soil Standards[4]	NJ Non-Residential Soil Standards[4]
PAHs continued (ppb)							
Dibenz(a,h)anthracene	ND	633	467	26%	14	660	660
Dibenzofuran	ND	ND	ND	-	6,200	-	0
1,2-Dichlorobenzene	ND	ND	ND	-	7,900	5,100,000	10,000,000
1,3-Dichlorobenzene	ND	ND	ND	-	1,600	5,100,000	10,000,000
1,4-Dichlorobenzene	ND	ND	ND	-	8,500	570,000	10,000,000
Fluoranthene	ND	6,500	2,933	55%	50,000	2,300,000	10,000,000
Fluorene	ND	ND	ND	-	410	2,300,000	10,000,000
Hexachlorobenzene	ND	ND	ND	-	3,200	660	2,000
Indeno(1,2,3-cd)pyrene	135	1,680	977	42%	36,400	900	4,000
2-Methlynaphthalene	ND	ND	ND	-	13,000	-	-
Naphthalene	ND	ND	ND	-	200	230,000	4,200,000
Nitrobenzene	ND	ND	ND	-	1,000	28,000	520,000
Pentachlorophenol	ND	ND	ND	-	50,000	6,000	24,000
Phenanthrene	ND	5,200	1,167	78%	50,000	-	-
Pyrene	ND	4,600	2,400	48%	-	1,700,000	10,000,000
Total PAHs	**277**	**33,077**	**16,537**				
Herbicides (ppb)							
2,4-D	ND	ND	6.7	-	500	-	-
2,4,5-TP (Silvex)	ND	ND	13.3	-	-	-	-
2,4,5-T	ND	ND	13.3	-	1,900	-	-
Total Herbicides	**ND**	**ND**	**33.3**				
Pesticides (ppb)							
alpha-BHC	ND	ND	ND	-	110	-	-
beta-BHC	ND	ND	ND	-	200	-	-
delta-BHC	ND	ND	ND	-	300	-	-
gamma-BHC (Lindane)	ND	ND	ND	-	60	-	-
Heptachlor	ND	ND	ND	-	100	150	650
Aldrin	ND	ND	ND	-	41	40	170
Heptachlor expoxide	ND	ND	ND	-	20	-	-
Endosulfan I	ND	ND	ND	-	900	34,000	6,200,000
Dieldrin	ND	ND	ND	-	44	42	170
4,4' - DDE	3.3	41.7	20.3	51%	2,100	2,000	9,000
Endrin	ND	ND	ND	-	100	17,000	310,000
Endrin ketone	1.1	ND	ND	-	-	-	-
Endrin aldehyde	ND	ND	ND	-	-	-	-
Endosulfan II	ND	ND	ND	-	900	34,000	6,200,000
4,4' - DDD	2.9	25.3	15.7	38%	2,900	3,000	12,000
Endosulfan sulfate	ND	ND	ND	-	1,000	-	-
4,4' - DDT	2.3	12.7	10.7	15%	21,000	2,000	9,000
Methoxychlor	ND	ND	ND	-	-	280,000	5,200,000
alpha-Chlordane	ND	ND	ND	-	540	-	-
gamma-Chlordane	ND	ND	ND	-	540	-	-
Toxaphene	ND	ND	ND	-	-	-	-
Total Pesticides	**9.57**	**79.65**	**46.70**				

Table 4-8
Validation Phase - Average Concentrations

	RAW-SD Average[1] (Inlet Sediment)	RAW-SL Average[1] (Inlet Solids)	PSD-SL Average[1] (Treated Sediment)	Percent Removal[2]	NY Recomended Soil Cleanup Objectives[3]	NJ Residential Soil Standards[4]	NJ Non-Residential Soil Standards[4]
PCBs (ppb)							
Aroclor 1016	ND	ND	ND	-	-	-	-
Aroclor 1221	ND	ND	ND	-	-	-	-
Aroclor 1232	ND	ND	ND	-	-	-	-
Aroclor 1242	ND	ND	ND	-	-	-	-
Aroclor 1248	ND	ND	ND	-	-	-	-
Aroclor 1254	26.0	303	203	33%	-	-	-
Aroclor 1260	ND	213	ND	92%	-	-	-
TOTAL PCBs	**26.0**	**517**	**203**		1,000	480	2,000
PCB Congeners (ppt)							
2-MonoCB	267	563	460	18%	-	-	-
Total Monochlorobiphenyls	653	1,367	1,200	12%	-	-	-
4,4'-DiCB	4,533	9,433	7,767	18%	-	-	-
Total Dichlorobiphenyls	12,333	24,667	20,000	19%	-	-	-
2,4,4'-TriCB	13,333	22,667	13,567	40%	-	-	-
Total Trichlorobiphenyls	45,333	91,667	52,000	43%	-	-	-
2,2',5,5'-TetraCB	5,967	14,000	7,600	46%	-	-	-
3,3',4,4'-TetraCB (#77)	1,600	2,867	2,400	16%	-	-	-
Total Tetrachlorobiphenyls	45,667	96,333	53,333	45%	-	-	-
2,3,3',4,4'-PentaCB (#105)	3,200	8,233	3,767	54%	-	-	-
2,3',4,4',5-PentaCB (#118)	6,200	8,767	6,700	24%	-	-	-
3,3',4,4',5-Penta CB (#126)	41	91	50	45%	-	-	-
Total Pentachlorobiphenyls	50,000	84,667	43,000	49%	-	-	-
2,3,3',4,4',5-Hexa CB (#156)	647	1,290	700	46%	-	-	-
3,3',4,4',5,5'-HexaCB (#169)	ND	ND	14.3	-	-	-	-
Total Hexachlorobiphenyls	26,333	48,333	25,000	48%	-	-	-
2,2',3,4,4',5,5'-HeptaCB (#180)	4,800	9,933	5,233	47%	-	-	-
Total Heptachlorobiphenyls	17,667	36,000	19,000	47%	-	-	-
2,2',3,3',4,4',5,5'-OctaCB	1,217	2,533	1,267	50%	-	-	-
Total Octachlorobiphenyls	4,367	9,767	4,100	58%	-	-	-
2,2',3,3',4,4',5,5',6-NonaCB	1,293	2,700	1,060	61%	-	-	-
Total Nonachlorobiphenyls	1,633	3,267	1,270	61%	-	-	-
DecaCB	1,073	2,000	910	55%	-	-	-
Total PCB Congeners	**205,060**	**398,067**	**219,813**				
Furans (ppt)							
TCDFs (total)	170	313	137	56%	-	-	-
2,3,7,8-TCDF	8.4	15.7	6.3	60%	-	-	-
PeCDFs (total)	153	280	117	58%	-	-	-
1,2,3,7,8-PeCDF	5.2	10.2	3.7	64%	-	-	-
2,3,4,7,8-PeCDF	10.3	17.7	7.3	58%	-	-	-
HxCDFs (total)	143	310	110	65%	-	-	-
1,2,3,4,7,8-HxCDF	47.3	108	39.7	63%	-	-	-
1,2,3,6,7,8-HxCDF	8.9	15	8.3	44%	-	-	-
2,3,4,6,7,8-HxCDF	3.3	9.2	3	67%	-	-	-
1,2,3,7,8,9-HxCDF	ND	ND	0.19	-	-	-	-

Table 4-8
Validation Phase - Average Concentrations

	RAW-SD Average[1] (Inlet Sediment)	RAW-SL Average[1] (Inlet Solids)	PSD-SL Average[1] (Treated Sediment)	Percent Removal[2]	NY Recomended Soil Cleanup Objectives[3]	NJ Residential Soil Standards[4]	NJ Non-Residential Soil Standards[4]
Furans Continued (ppt)							
HpCDFs (total)	240	520	173	67%	-	-	-
1,2,3,4,6,7,8-HpCDF	173	383.3	123	68%	-	-	-
1,2,3,4,7,8,9-HpCDF	5.0	14	5.2	63%	-	-	-
OCDF	243	586.7	200	66%	-	-	-
Dioxins (ppt)							
TCDDs (total)	59.7	242	48.7	80%	-	-	-
2,3,7,8-TCDD	39.0	91.3	35.3	61%	-	-	-
PeCDDs (total)	6.4	18.3	5.97	67%	-	-	-
1,2,3,7,8-PeCDD	ND	2.7	0.52	81%	-	-	-
HxCDDs (total)	100	167	59.7	64%	-	-	-
1,2,3,4,7,8-HxCDD	1.67	3.7	0.65	82%	-	-	-
1,2,3,6,7,8-HxCDD	7.87	15.3	5.47	64%	-	-	-
1,2,3,7,8,9-HxCDD	7.67	12.6	4.4	65%	-	-	-
HpCDDs (total)	327	537	180	66%	-	-	-
1,2,3,4,6,7,8-HpCDD	128	223	70	69%	-	-	-
OCDD	1,243	2267	577	75%	-	-	-
TEQ (Calculated)	**57.5**	**129**	**49.0**				
Priority Pollutant Metals (ppm)							
Antimony	0.62	0.054	0.081	-	SB	14	340
Arsenic	11.40	12.3	7.8	36%	7.5	20	20
Beryllium	0.81	0.86	0.41	52%	0.16	2	2
Cadmium	2.63	3.1	1.23	61%	1	39	100
Chromium	132.5	169	49.5	71%	10	-	-
Copper	128.2	165	56.6	66%	25	600	600
Lead	136.9	157	67.9	57%	SB	400	600
Nickel	32.27	32.4	24.6	24%	13	250	2,400
Selenium	1.23	0.98	0.47	52%	2	63	3,100
Thallium	0.22	0.21	0.19	8%	SB	2	2
Zinc	244	279	131	53%	20	1,500	1,500
Mercury	3.13	3.9	0.30	92%	0.1	14	270
Silver	2.27	3.3	0.93	72%	SB	110	4,100

[1] Averages calculated using individual sample values and half the detection limit for samples reported as non-detect. Averages were considered non-detect (ND) if all samples were below detection limits.

[2] Percent removal calculated between solid fraction of untreated sediment (RAW-SL) and treated sediment (PSD-SL).

[3] NYDEC, 1994

[4] NJDEP, 1999

SB = Site Background
ND = Non-detect

Data collected during the Pilot Demonstration Project was used to perform mass balance calculations to track the fate of the contaminants in the dredged material through the BioGenesis^{SM} Sediment Washing Process. This data will be used during scale-up design activities for full-scale equipment selection and sizing. The mass balance calculations, provided in Appendix E of this report, are discussed with the contaminant removal efficiencies for the Process Validation test runs in the following subsections. Treated sediment (PSD) results are compared to results for SL fractions of RAW sediment samples. All results are discussed using average concentration values for Process Validation samples. Summaries of the sampling data collected during the validation phase are presented in Appendix D, Tables D-2 through D-11. Analytical data packages are included in Appendix F of this report. A sample identification reference table (Sample ID compared to Laboratory ID) is provided in Appendix D, Table D-12.

4.3.1 Process Validation QA Review

QA review for the samples collected during Process Validation included the evaluation of 11 analytical reports containing results for VOCs, SVOCs, PPL metals, herbicides, pesticides, PCBs, dioxins, furans, wet chemistry, and grain size. A total of 61 samples were collected over a period of 3 days. QC samples including MS/MSDs, duplicates, trip blanks, field blanks, method blanks, and laboratory control samples (LCSs) were analyzed for each analytical batch in accordance with standard methods. All data have been found to be compliant with the QAPP, with the exception of those items noted below:

- The majority of MS/MSD spike recoveries and RPDs, as well as surrogate recoveries were within Method QC limits. In the cases where recoveries fell outside of the method-specific acceptance limits, most of the excursions could be attributed to matrix interference. For those samples the acceptable LCS analysis data indicated that the analytical system was operating within control thus confirming that the condition is most likely due to matrix interference. In addition, some MS/MSD recoveries and RPDs were not calculated because the sample amount was more than four times the spike amount. This practice follows standard operating procedures.

- In general, the method blanks associated with all of the samples were free of contamination. Acetone, an EPA-defined common laboratory contaminant, was detected below its reporting limits in the sediment, solid, and aqueous VOC samples. Some metals were detected at levels below their reporting limits in the solid and aqueous method blanks. The low levels are typical for the methods used.

The analyte-specific QA items identified during a review of the Process Validation data follow:

- **PPL Metals** – Five 5 archived aqueous samples for mercury from Lot C9D170144 (PAQ-V1-AQ-03, PAQ-V1-AQ-03DUP, PAQ-V3-AQ-03, PAQ-V2-AQ-03, and PSW-V3-AQ-03) were received 3 days outside, and analyzed 12 days outside of the holding time for the method. The archived samples were shipped to the lab and analyzed due to incorrect preservation from previous shipment.

- Analytical results for aqueous field blank FBK-V3-AQ-02 detected the following analytes above their reporting limits. They included chromium at 1.5 μg/L, copper at 2.5 μg/L, lead at 1.0 μg/L, and zinc at 37.7 μg/L. None of the compounds were detected above their reporting limits in the applicable method blank.

- The ICPMS run on 6 April 1999 has antimony outside of control limits for the initial calibration verification (ICV). The samples did not detect any antimony and all results are reported.

- **SVOCs** – Sediment sample RAW-V1-SD-02DUP exceeded its holding time for extraction by 9 days. This sample was incorrectly analyzed by the laboratory as a "second" duplicate of RAW-V1-SD-01. There is no effect on the data for the original sample and duplicate.

- Nine sediment samples have p-terphenyl surrogate recoveries outside the acceptance limits, and sample RAW-V1-SD-02DUP had the surrogate recovery for 2,4,6-tribromophenol outside the acceptance limits. All other surrogates were within QC limits.

- The solid phase method blank, LCS, and LCS duplicate for samples PAQ-V3-SL-01 and PAQ-V2-SL-01 had the surrogate phenol d-5 exceeding QC limits. Reanalysis of the method blank has an internal standard exceeding QC limits. A third analysis could not be performed due to limited sample volume. It is suspected that the concentration of the extract caused the recoveries to exceed the QC limits. Only the original analysis is reported.

- **VOCs** – Aqueous sample PAQ-V2-AQ-03 from Lot C9D170144 was an archive sample which was sent for analysis due to broken sample container. The sample was received 17 days outside and analyzed 20 days outside of the analytical holding time for the method. Otherwise, there were no major anomalies associated with these samples. The data can be used as designed.

- **Wet Chemistry** – Several solid and aqueous phase samples are reported with dilutions due to high target analytes or matrix interference. All samples and tests were prepared and analyzed within the method-specific holding times except for the following aqueous samples: the BOD holding time (2 days) was exceeded in PAQ-V1-AQ-01, PAQ-V1-AQ-02, and PAQ-V1-AQ-02DUP by 6 days, and in PAQ-V3-AQ-01 by 5 days; the TSS holding time (7 days) was exceeded in PPO-V1-AQ-01, CCO-V1-AQ-01, OXO-V1-AQ-01, and RAW-V1-AQ-01 by 2 days; the TOC

holding time (28 days) was exceeded in RAW-V1-AQ-03 and RAW-V2-AQ-03 by 7 days**.** This data was collected for internal design purposes, therefore, the analysis was completed and reported.

- **Herbicides** – Due to matrix interference, surrogate recoveries for aqueous and sediment samples were outside of acceptance limits. Otherwise, there were no major anomalies associated with these samples. The data can be used as designed.

- **Pesticides** – All solid phase samples were analyzed at a dilution. Several of these samples had the surrogates diluted out, resulting in surrogate recoveries outside acceptance limits. Due to matrix interference, several aqueous samples had surrogate recoveries outside acceptance limits in both columns (10 of 11 surrogates).

- **PCBs** – Due to matrix interference, 7 of 8 sediment samples, 18 of 21 solid samples, and 2 of 2 aqueous samples had surrogate recoveries outside acceptance limits. The applicable LCS analysis data indicated that the analytical systems were operating within control thus confirming that the condition is most likely due to matrix interference.

- **High Resolution PCBs** – The sediment, solid, and aqueous method blanks contained analytes detected at low levels. This is commonly seen at or near the lower calibration limit for high resolution PCBs; however, in these instances it is even more pronounced. This is due to the method blanks being processed with high level samples and most likely receiving some cross-contamination. All target analytes that are positive in the sample are flagged with a “B” qualifier.

- Most MS/MSD recoveries and RPDs are not calculated due to concentrations exceeding calibration ranges. These results are flagged as "out of control" or reported as "NA" because the amounts spiked are inappropriate for the levels found in the parent sample.

- **Dioxins/Furans** – The sediment sample RAW-V1-SD-02 MSD recoveries and RPDs were exceeded for the following analytes: 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF. The solid sample PSD-V1-SL-02 MS/MSD recoveries were below the QC limits and the RPD was exceeded for 1,2,3,4,7.8-HxCDF. Some elevated detection limits are reported for 1,2,3,6,7,8-HxCEF due to chemical interference from a coeluting diphenyl ether (DPE). Otherwise, there were no anomalies associated with the sediment samples in this lot.

- The aqueous MS/MSD QC limits are not presented on the data summary sheets. These analyte recoveries and RPDs in the MS/MSD are flagged as “out of control” or reported as “NA” because the amounts spiked are inappropriate for the levels found in the parent sample. All internal standard recoveries are out of control limits (low bias) for aqueous sample RAW-V2-AQ-01.

In general, the analytical data from Process Validation sampling met the requirements of the QAPP with the above noted exceptions. As previously discussed, three sets of samples were

collected during Process Validation, and averaged together to evaluate the results. This would tend to reduce the effect of individual QA exceptions noted above. In addition, where matrix interferences caused problems with surrogates and matrix spikes, the recoveries were generally biased low which could indicate the analytical data would be biased low. Since the data is used to compare results from one process step to another process, this impact is minimal. Based on these explanations, the data will be used as designed.

4.3.2 Grain Size Results

Samples of the untreated sediment slurry (RAW) and the treated sediment (PSD) were analyzed for grain size distribution as discussed in Section 3. Samples of the centrate (overflow from the centrifuge) could not be analyzed for grain size distribution due to the low level of solids in the samples. The results for the grain size analyses are summarized in Appendix D, Table D-10. On average, the untreated (RAW) sediment consisted of 4% sand, 52% silt, and 42% clay, and the treated sediment (PSD) consisted of 7% sand, 72% silt, and 21% clay.

Presented in Figure 4-1 is a comparison of the average grain size distribution from the untreated sediment (RAW) to the grain size distribution of the treated sediment (PSD). A comparison of these curves provides an estimation of the grain size distribution of the sediment in the centrate, which is plotted on Figure 4-1. Based on the data, 100% of the sediment particles with grain sizes greater than 0.1 millimeters were recovered in the centrifuge cake or treated sediment (PSD). The “50% cut point” is the particle size where theoretically 50% of the sediment particles with smaller grain sizes are recovered. This is the practical limit of grain size recovery for a particular piece of liquid/solid separation equipment. Based on the data in Figure 4-1, the 50% cut point for the centrifuge used during the Pilot Demonstration Project was 0.008 millimeters or 8 microns. In other words, 50% of the sediment particles with grain sizes less than 8 microns were recovered in the centrifuge cake or treated sediment (PSD).

4.3.3 Total Organic Carbon Results

Presented in Figure 4-2 is a graph representing the average concentrations of TOC in the untreated (RAW) and treated (PSD) sediment during the Process Validation Phase. In contrast to all other analytical results, analytical data for TOCs shows an decrease in concentrations from

Figure 4-1 Process Validation Phase Grain Size Analytical Data

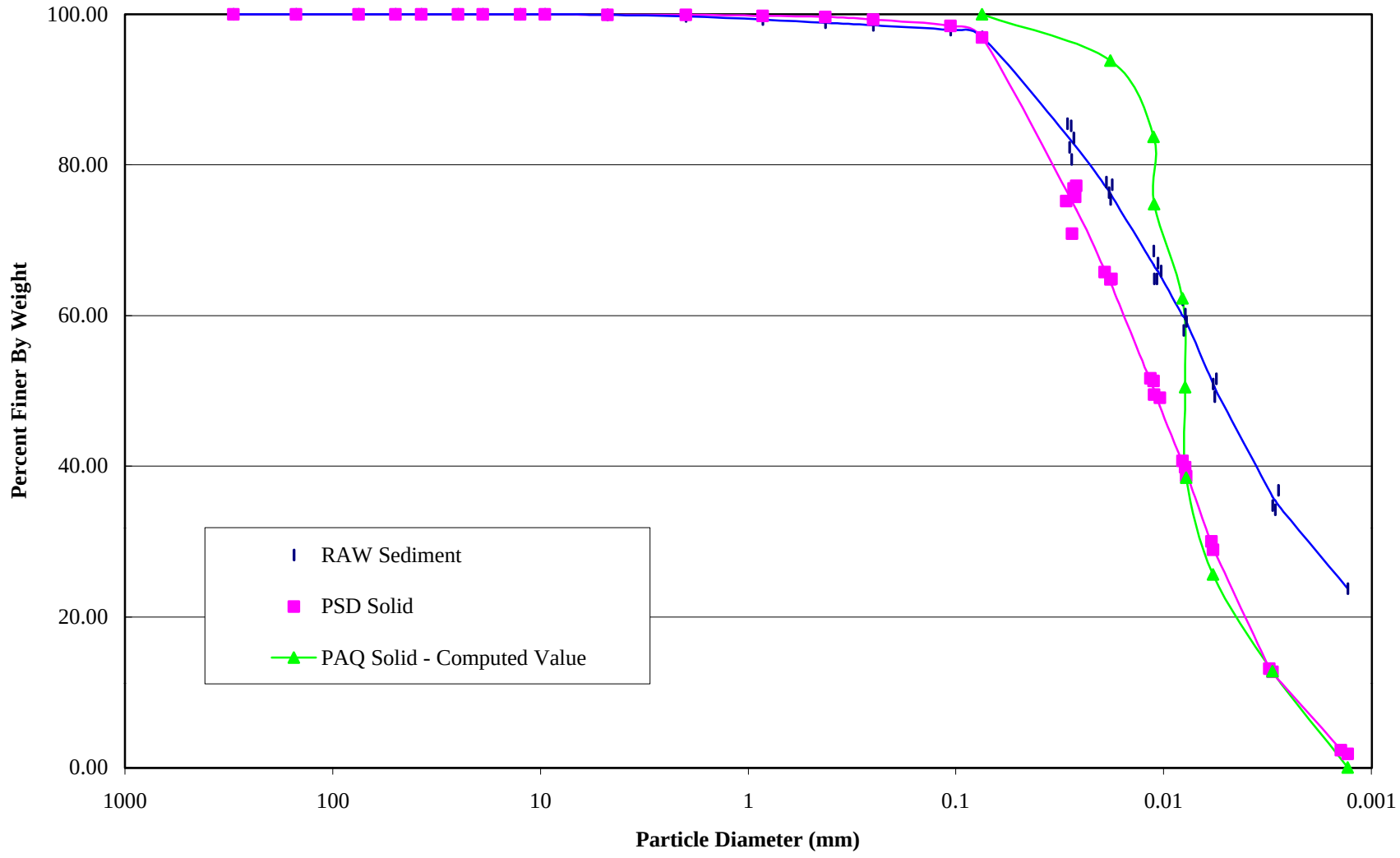
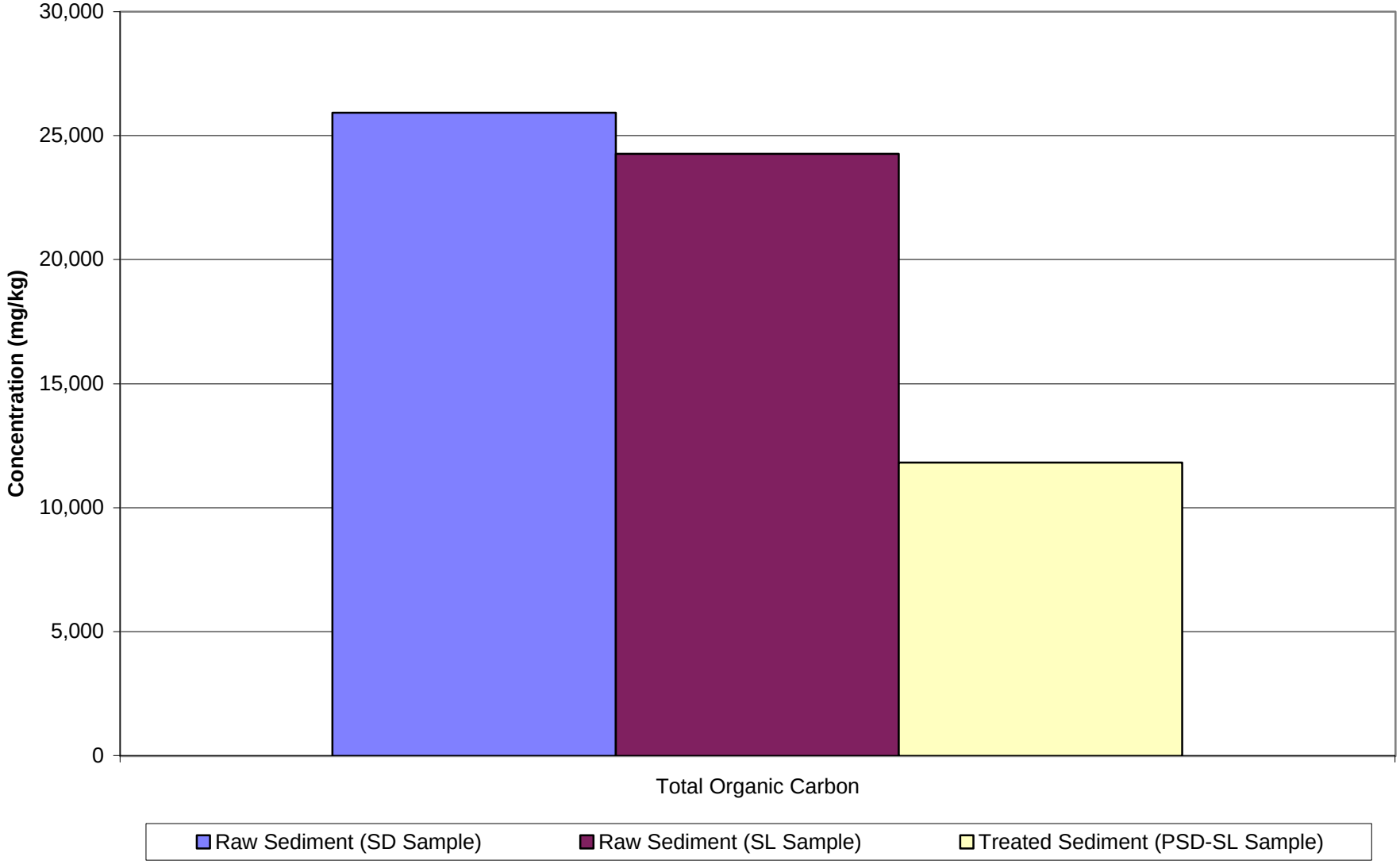


Figure 4-2 Process Validation Analytical Results for TOC



Note: ND is taken as half the detection limit.

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the untreated sediment slurry (SD sample) to the solid fraction of the untreated sediments (SL sample). However, to remain consistent, a comparison of analytical results from the solid fraction of the untreated sediment and the treated sediment, the BioGenesis^{SM} Sediment Washing Process achieved an average of 51% reduction in TOC.

4.3.4 Metals Results – General

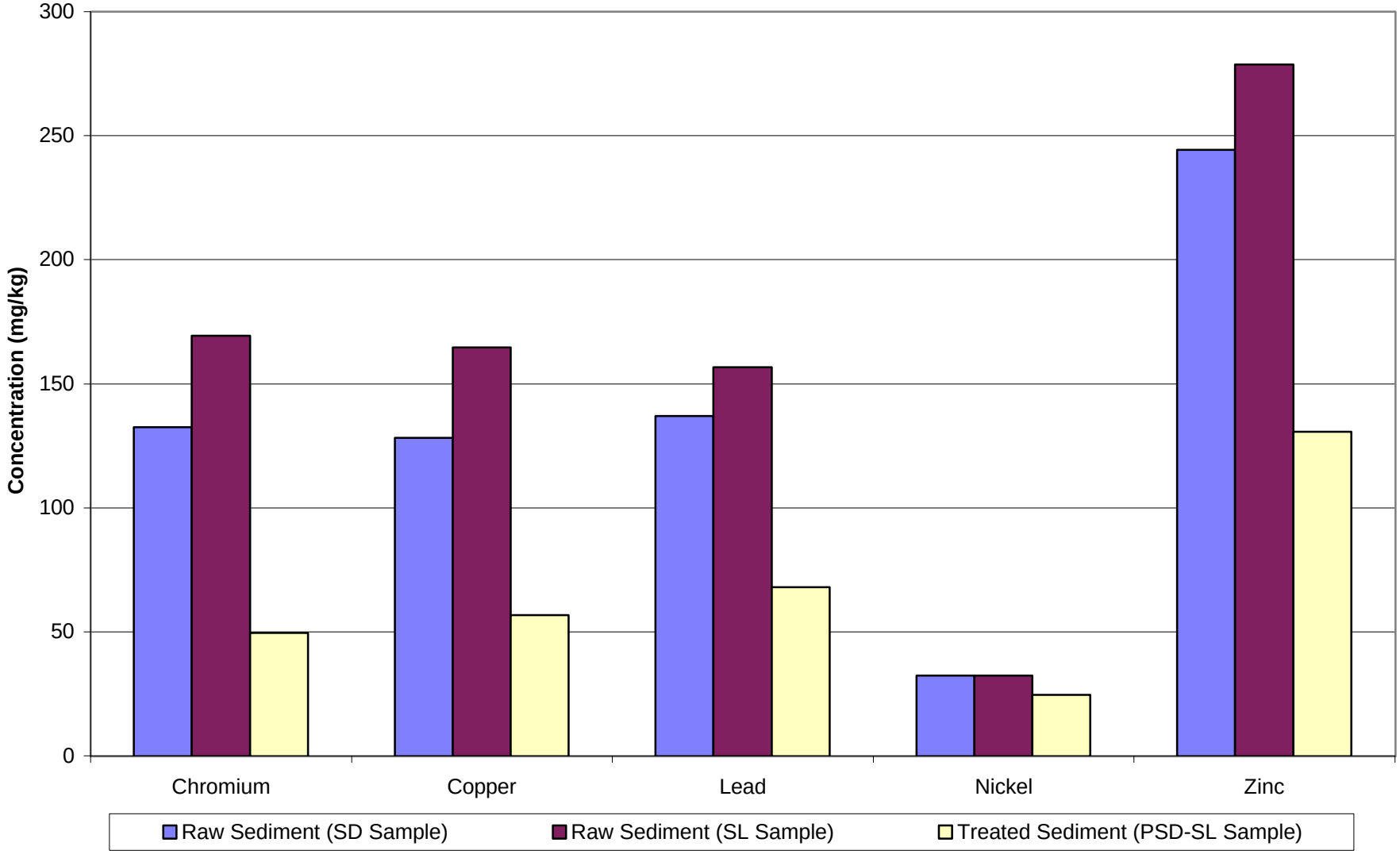
Presented in Figures 4-3a and 4-3b are graphs representing the average concentrations for metals in the untreated (RAW) and treated (PSD) sediment during Process Validation. As discussed above, analytical data show an increase in metal concentrations from the untreated sediment slurry to the solid fraction of the untreated sediments. Based on a comparison of analytical results from solid fraction samples of the untreated sediment and the treated sediment samples, the BioGenesis^{SM} Sediment Washing Process achieved an average of 54% reduction in PPL metals during Process Validation. Individual removal percentages ranged from 8% (thallium) to 92% (mercury).

According to the NJDEP, mercury, nickel, lead, copper and cadmium are the primary metals of concern in the NY/NJ Harbor based on their toxicity and distribution in the harbor. The fate of these metals through the BioGenesis^{SM} Sediment Washing Process, during the Process Validation Phase, is discussed below. The results are compared to the applicable New Jersey Residential Direct Contact Soil Cleanup Criteria (NJRDCSCC) since the proposed product for beneficial use is a manufactured soil.

4.3.4.1 Mercury

Mercury was detected in the raw sediment at concentrations ranging from 2.8 to 3.5 mg/kg. The average concentration of mercury in the treated sediment cake was 0.30 mg/kg showing a 92% reduction in mercury from the raw solids (RAW-SD) to the treated solids (PSD-SL). The NJRDCSCC for mercury is 14 mg/kg, and none of the sediment samples collected during Process Validation (pre-treatment or post-treatment) exceeded this standard. Presented in Figure 4-4 are graphs of the mass balance calculations for mercury and the concentration of mercury in the solids throughout the BioGenesis^{SM} Sediment Washing Process. The upper graph shows an overall reduction in total mass of mercury through the process. Since mercury is inert, this

Figure 4-3a Process Validation Analytical Results for Metals



Note: ND is taken as half the detection limit.

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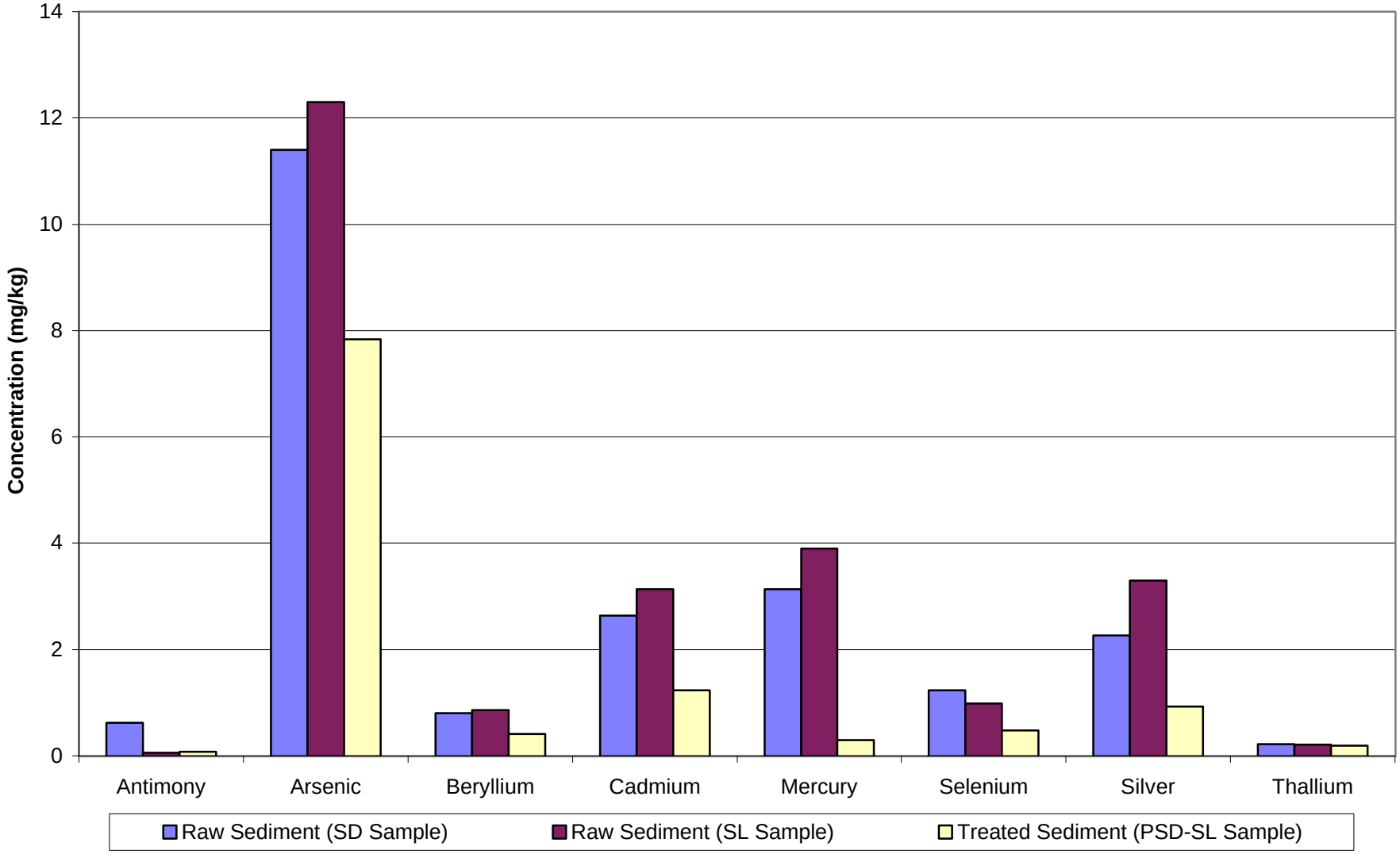
Figure 4-3b Process Validation Analytical Results for Metals



Note: ND is taken as half the detection limit.

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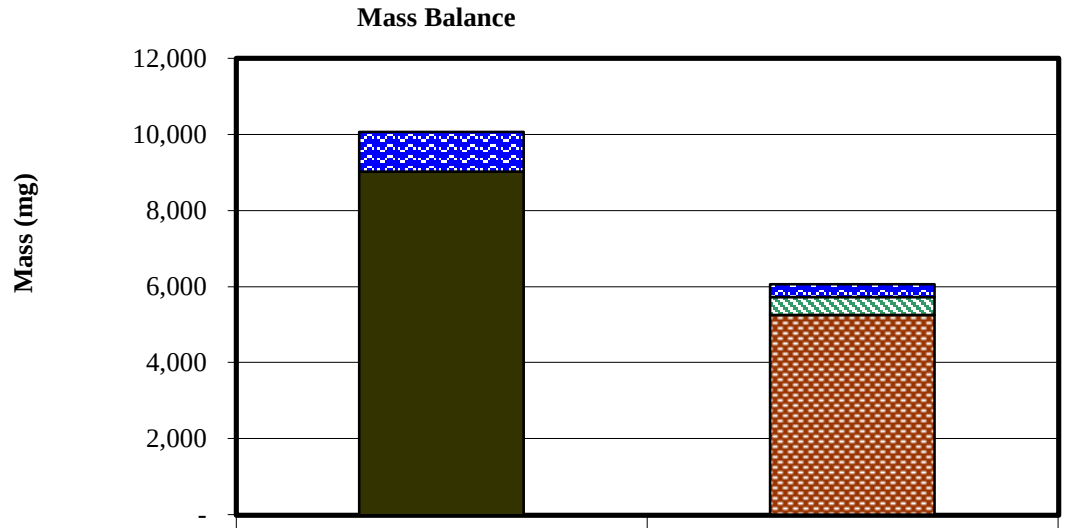
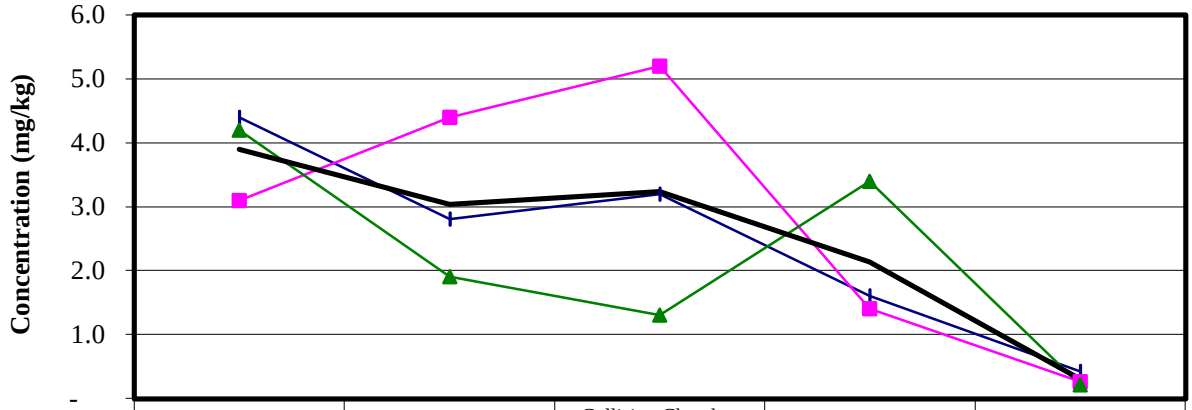
Figure 4-4 Mass Balance for Mercury



	Total Process Inlets	Total Process Oulets
Mass of Mercury in Liquids	1,039	340
Mass of Mercury on Treated Solids		465
Mass of Mercury on Solids in Centrate		5,253
Mass of Mercury on Untreated Solids	9,024	



	Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment
Run V1	4.4	2.8	3.2	1.6	0.42
Run V2	3.1	4.4	5.2	1.4	0.26
Run V3	4.2	1.9	1.3	3.4	0.21
Average	3.9	3.0	3.2	2.1	0.30

reduction is not expected, and it is proposed that some mercury could have been volatilized. The trends on the lower graph in Figure 4-4 indicate an overall reduction of the mass of mercury in the solids throughout the process as expected.

4.3.4.2 Nickel

Nickel was detected in the raw sediment at concentrations ranging from 22.3 mg/kg to 43.7 mg/kg with an average of 32.3 mg/kg. The average concentration of nickel in the treated sediment cake was 24.6 mg/kg showing a 24% reduction in nickel. The NJRDCSCC for nickel is 250 mg/kg, and none of the sediment samples collected during Process Validation (pre-treatment or post-treatment) exceeded this standard. Presented in Figure 4-5 are graphs of the mass balance calculations for nickel and the concentration of nickel in the solids throughout the BioGenesis^{SM} Sediment Washing Process. The upper graph shows a balance in total mass of nickel (within 10%) through the process, as expected. The trends on the lower graph in Figure 4-5 indicate an overall reduction of the mass of nickel in the solids throughout the process.

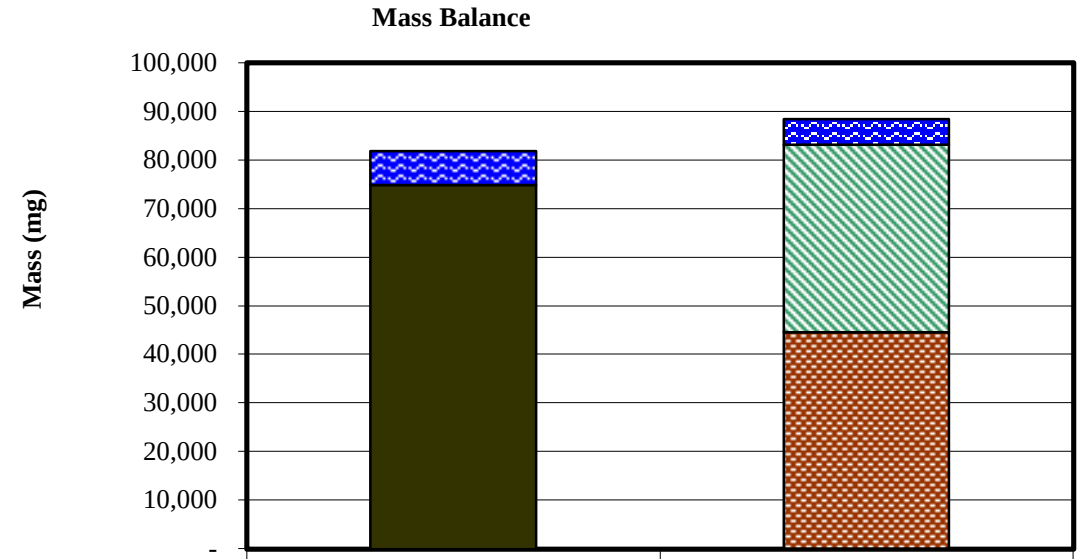
4.3.4.3 Lead

Lead was detected in the raw sediment at concentrations ranging from 95.8 mg/kg to 181 mg/kg with an average of 137 mg/kg. The average concentration of lead in the treated sediment cake was 67.9 mg/kg showing a 57% reduction in lead. The NJRDCSCC for lead is 400 mg/kg, and none of the sediment samples collected during Process Validation (pre-treatment or post-treatment) exceeded this standard. Presented in Figure 4-6 are graphs of the mass balance calculations for lead and the concentration of lead in the solids throughout the BioGenesis^{SM} Sediment Washing Process. The upper graph shows a balance in total mass of lead (within 10%) through the process, as expected. The trends on the lower graph in Figure 4-6 indicate an overall reduction of the mass of lead in the solids throughout the process.

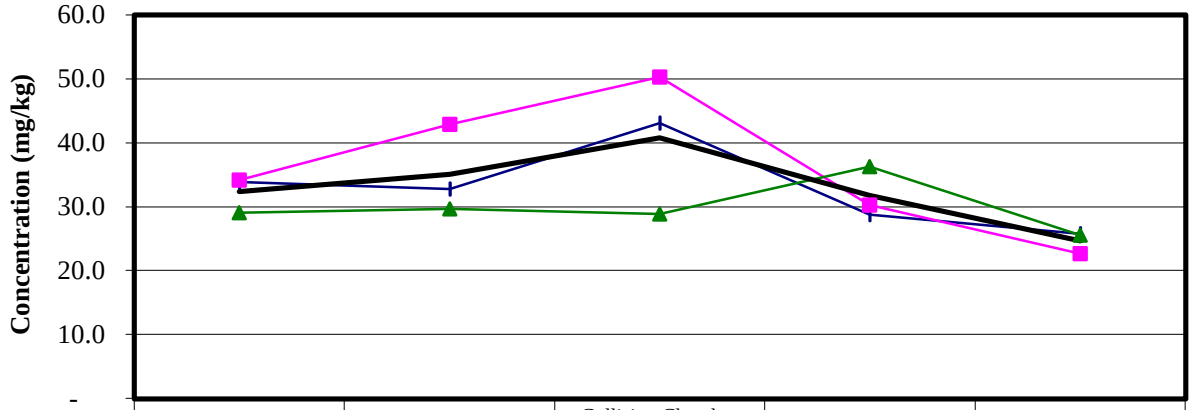
4.3.4.4 Copper

Copper was detected in the raw sediment at concentrations ranging from 89.7 mg/kg to 173 mg/kg with an average of 128 mg/kg. The average concentration of copper in the treated sediment cake was 56.6 mg/kg showing a 66% reduction in copper. The NJRDCSCC for copper

Figure 4-5 Mass Balance for Nickel

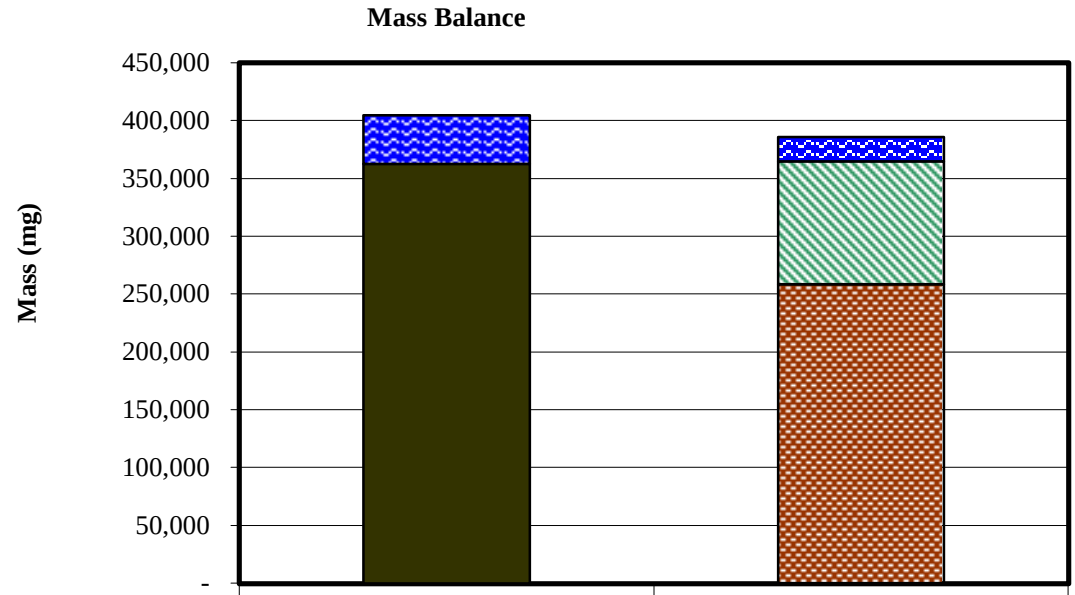


	Total Process Inlets	Total Process Oulets
Mass of Nickel in Liquids	6,896	5,374
Mass of Nickel on Treated Solids		38,546
Mass of Nickel on Solids in Centrate		44,542
Mass of Nickel on Untreated Solids	74,891	

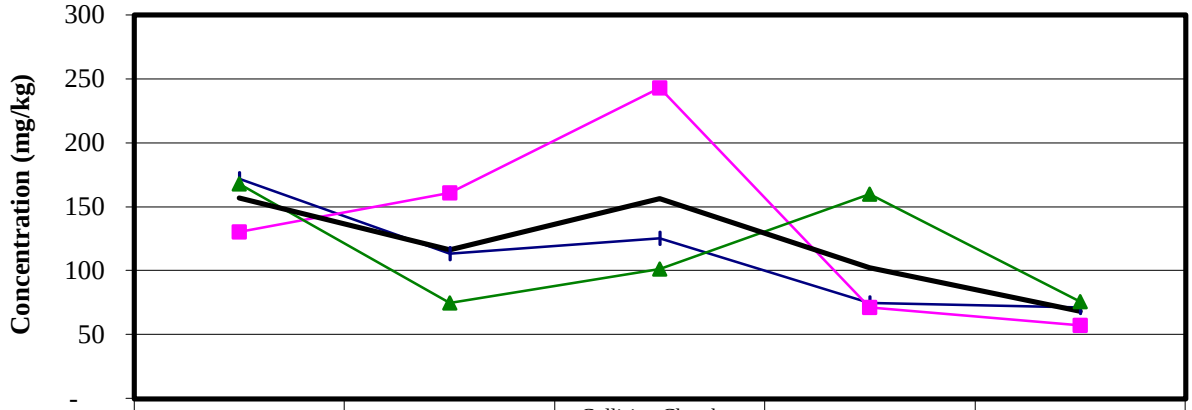


	Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment
Run V1	33.9	32.8	43.1	28.7	25.7
Run V2	34.2	42.9	50.3	30.3	22.6
Run V3	29.0	29.6	28.8	36.3	25.5
Average	32.4	35.1	40.7	31.8	24.6

Figure 4-6 Mass Balance for Lead



	Total Process Inlets	Total Process Oulets
Mass of Lead in Liquids	42,357	21,027
Mass of Lead on Treated Solids		106,444
Mass of Lead on Solids in Centrate		258,441
Mass of Lead on Untreated Solids	362,500	



	Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment
Run V1	172	113	125	74.7	71.1
Run V2	130	161	243	71.3	57.2
Run V3	168	74.6	101	160	75.5
Average	157	116	156	102	67.9

is 600 mg/kg, and none of the sediment samples collected during Process Validation (pre-treatment or post-treatment) exceeded this standard. Presented in Figure 4-7 are graphs of the mass balance calculations for copper and the concentration of copper in the solids throughout the BioGenesis^{SM} Sediment Washing Process. The upper graph shows a balance in total mass of copper (within 10%) through the process, as expected. The trends on the lower graph in Figure 4-7 indicate an overall reduction of the mass of lead in the solids throughout the process.

4.3.4.5 Cadmium

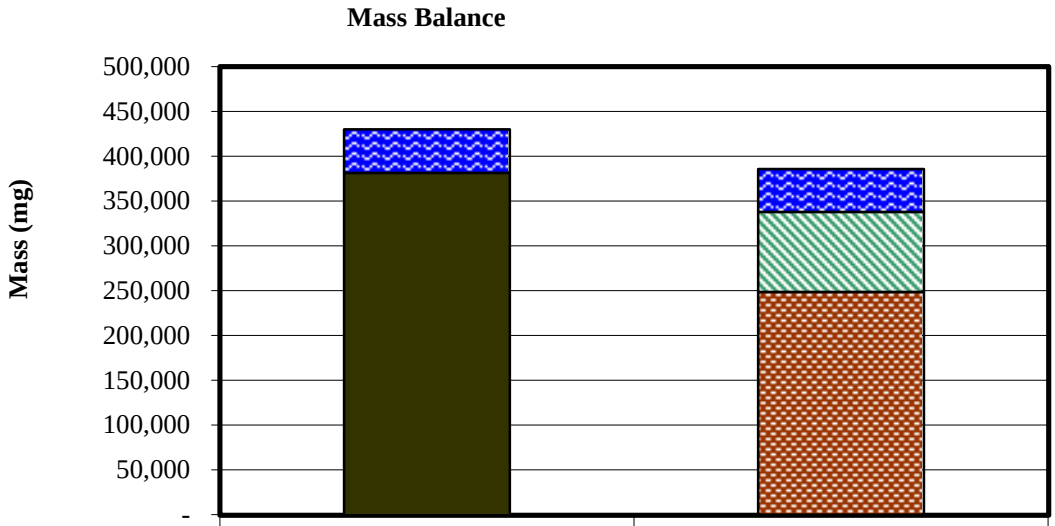
Cadmium was detected in the raw sediment at concentrations ranging from 1.9 mg/kg to 3.4 mg/kg with an average of 2.6 mg/kg. The average concentration of cadmium in the treated sediment cake was 1.23 mg/kg showing a 61% reduction in cadmium. The NJRDCSCC for cadmium is 39 mg/kg, and none of the sediment samples collected during Process Validation (pre-treatment or post-treatment) exceeded this standard. Presented in Figure 4-8 are graphs of the mass balance calculations for cadmium and the concentration of cadmium in the solids throughout the BioGenesis^{SM} Sediment Washing Process. The upper graph shows a balance in total mass of cadmium (within 10%) through the process, as expected. The trends on the lower graph in Figure 4-8 indicate an overall reduction of the mass of cadmium in the solids throughout the process.

4.3.5 PAH Results

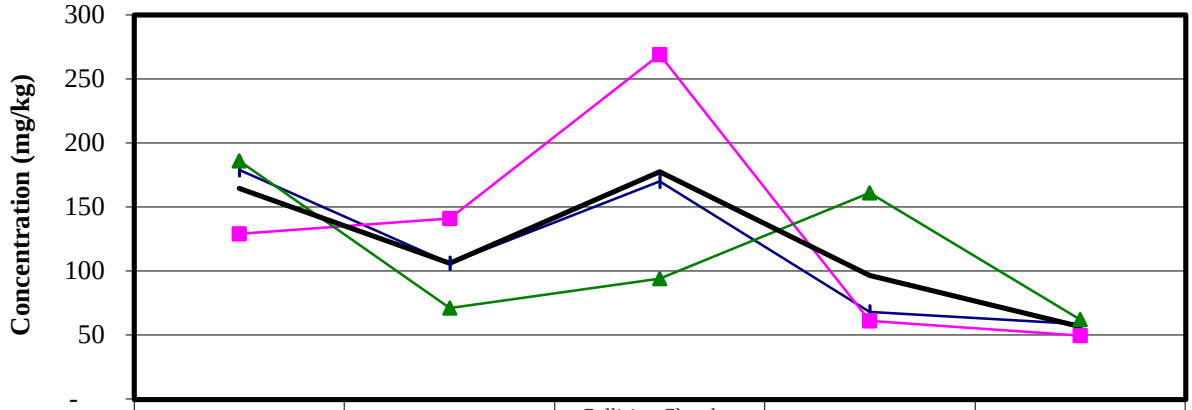
Presented in Figure 4-9 is a graph representing the average concentrations for detected PAHs in the untreated (RAW) and treated (PSD) sediment during Process Validation. As previously discussed, analytical data shows an increase in PAH concentrations from the untreated sediment slurry (SD sample) to the solid fraction of the untreated sediments (SL sample). Based on a comparison of analytical results from the solid fraction of the untreated sediment and the treated sediment PSD, the BioGenesis^{SM} Sediment Washing Process achieved an average 41% reduction in detected PAHs during Process Validation. Individual removal percentages ranged from 25% (benzo(k)fluoranthene) to 78% (phenanthrene).

Based on a consistent detectable sample concentrations and a comparison of results to NJRDCSCC levels, the fate of benzo(a)pyrene and fluoranthene through the BioGenesis^{SM}

Figure 4-7 Mass Balance for Copper

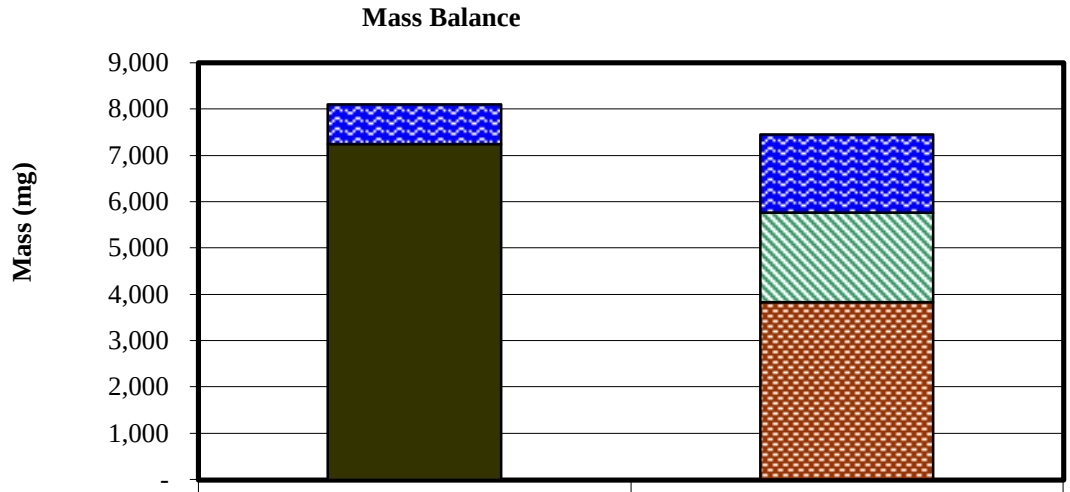


	Total Process Inlets	Total Process Oulets
Mass of Copper in Liquids	48,381	47,792
Mass of Copper on Treated Solids		89,313
Mass of Copper on Solids in Centrate		248,731
Mass of Copper on Untreated Solids	381,782	

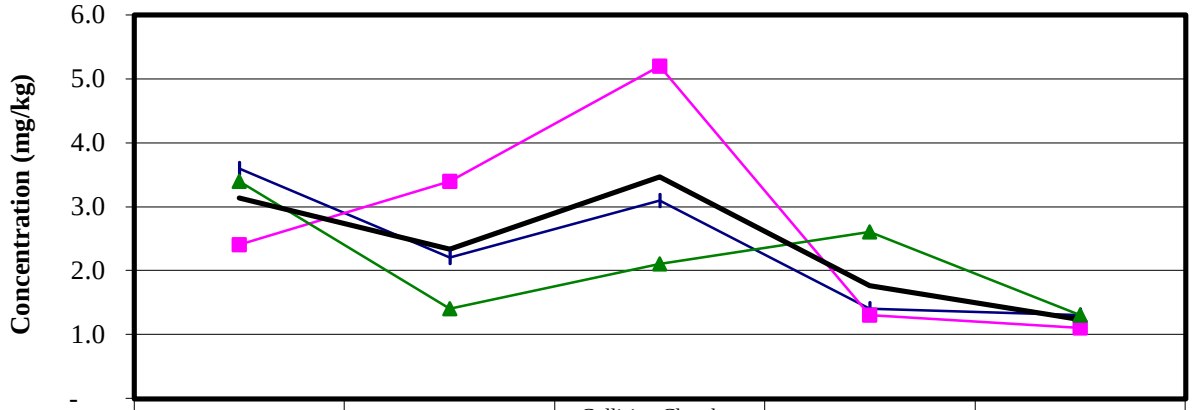


	Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment
Run V1	179	106	170	68	58
Run V2	129	141	269	61	50
Run V3	186	71	94	161	62
Average	165	106	178	97	57

Figure 4-8 Mass Balance for Cadmium

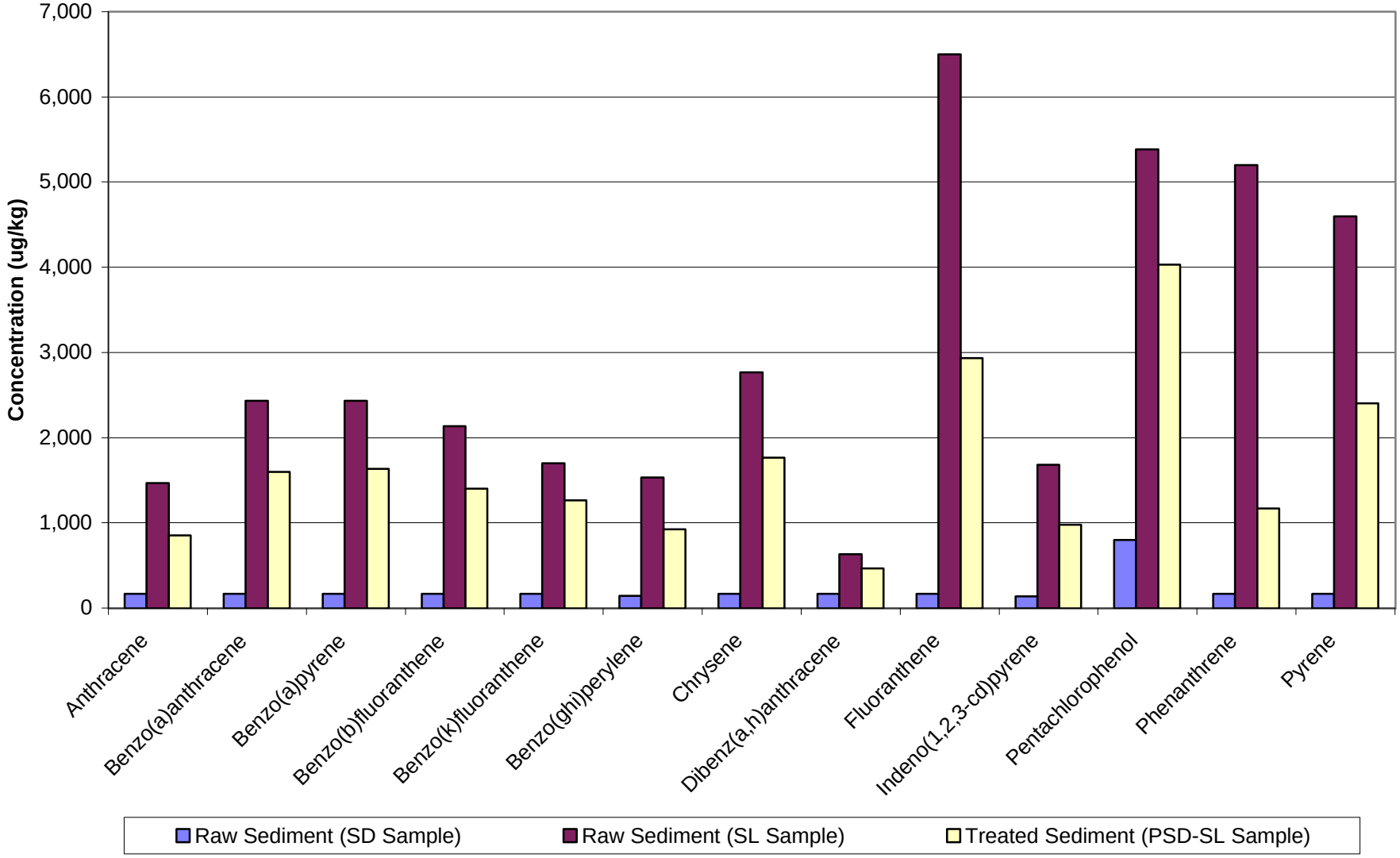


	Total Process Inlets	Total Process Oulets
Mass of Cadmium in Liquids	845	1,683
Mass of Cadmium on Treated Solids		1,933
Mass of Cadmium on Solids in Centrate		3,834
Mass of Cadmium on Untreated Solids	7,250	



	Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment
Run V1	3.6	2.2	3.1	1.4	1.3
Run V2	2.4	3.4	5.2	1.3	1.1
Run V3	3.4	1.4	2.1	2.6	1.3
Average	3.1	2.3	3.5	1.8	1.2

Figure 4-9 Process Validation Analytical Results for PAHs



Note: ND is taken as half the detection limit.

0031_SEC4_FIG_b.xls,PAHs

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Sediment Washing Process, during the Process Validation Phase is discussed below. The fate of these compounds are considered representative of the fate of PAHs.

4.3.5.1 Benzo(a)pyrene

Benzo(a)pyrene a carcinogenic PAH was not detected in the RAW sediment sample above its detection limit of 330 ug/kg. However, after the RAW sediment sample was separated using the bench-top centrifuge, benzo(a)pyrene was detected at an average concentration of 2,433 ug/kg in the solid phase samples. Average benzo(a)pyrene concentrations in the treated sediment cake was 1,633 ug/kg showing a 33% reduction in benzo(a)pyrene. The NJRDCSCC for benzo(a)pyrene is 660 mg/kg. Samples of the treated sediment exceeded this standard, however, it is expected that additional oxidant addition could achieve the NJRDCSCC.

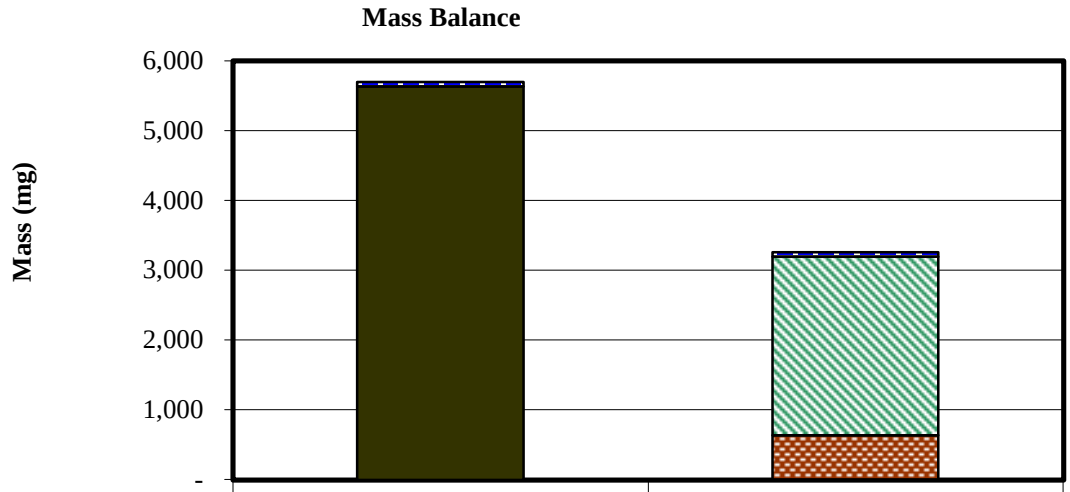
Presented in Figure 4-10 are graphs of the mass balance calculations for benzo(a)pyrene and the concentration of benzo(a)pyrene in the solids throughout the BioGenesis^{SM} Sediment Washing Process. The upper graph shows a reduction in the total mass of benzo(a)pyrene through the process, suggesting a destruction through the process. The trends on the lower graph in Figure 4-10 indicate a transfer of benzo(a)pyrene from the solid to the liquid phase.

4.3.5.2 Fluoranthene

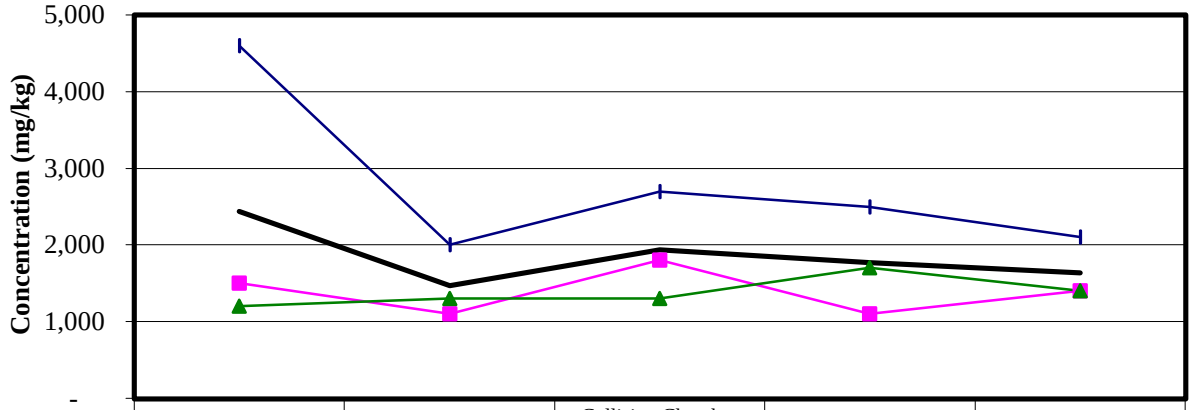
Fluoranthene was not detected in the RAW sediment sample above its detection limit of 330 ug/kg. However, after the RAW sediment sample was separated using the bench-top centrifuge, fluoranthene was detected at an average concentration of 6,500 ug/kg in the solid phase samples. The concentration of the liquid phase of the RAW sediment sample was considered zero. Average fluoranthene concentrations in the treated sediment cake was 2,933 ug/kg showing a reduction of 55% in Fluoranthene. The NJRDCSCC for fluoranthene is 2,300,000 ug/kg, and none of the sediment samples collected during the validation phase (pre-treatment or post-treatment) exceeded this standard.

Presented in Figure 4-11 are graphs of the mass balance calculations for fluoranthene and the concentration of fluoranthene in the solids throughout the BioGenesis^{SM} Sediment Washing Process. The upper graph shows a reduction in the total mass of fluoranthene through the

Figure 4-10 Mass Balance for Benzo(a)pyrene

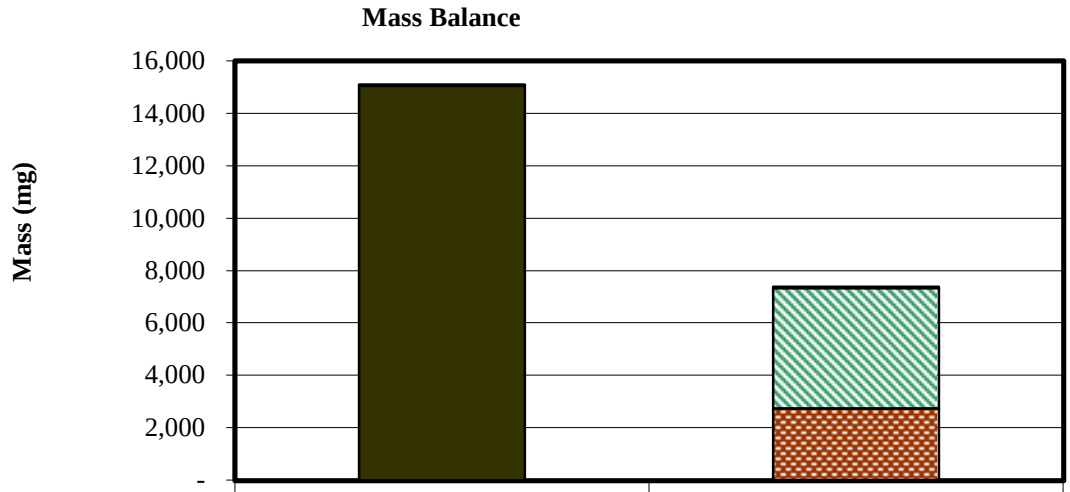


	Total Process Inlets	Total Process Oulets
Mass of Benzo(a)pyrene in Liquids	70	59
Mass of Benzo(a)pyrene on Treated Solids		2,559
Mass of Benzo(a)pyrene on Solids in Centrate		635
Mass of Benzo(a)pyrene on Untreated Solids	5,630	

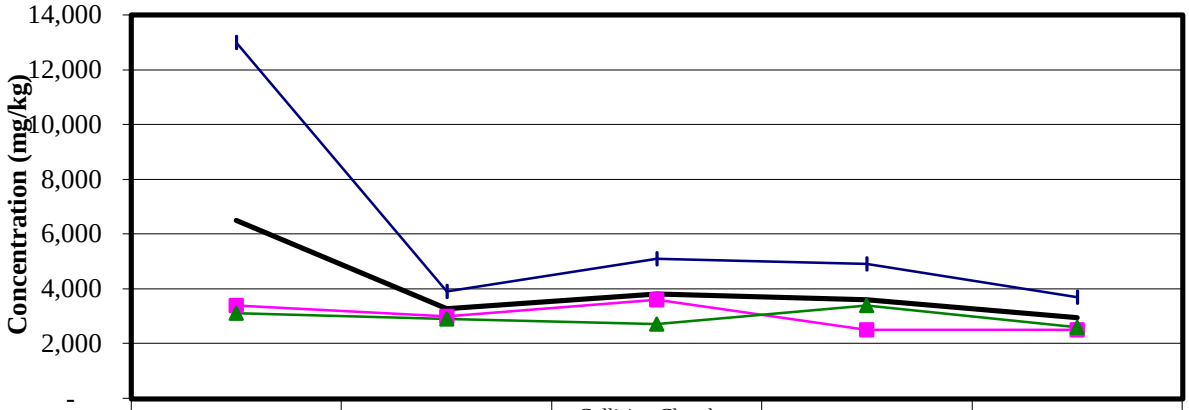


	Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment
Run V1	4,600	2,000	2,700	2,500	2,100
Run V2	1,500	1,100	1,800	1,100	1,400
Run V3	1,200	1,300	1,300	1,700	1,400
Average	2,433	1,467	1,933	1,767	1,633

Figure 4-11 Mass Balance for Fluoranthene



	Total Process Inlets	Total Process Oulets
Mass of Fluoranthene in Liquids	65	30
Mass of Fluoranthene on Treated Solids		4,596
Mass of Fluoranthene on Solids in Centrate		2,739
Mass of Fluoranthene on Untreated Solids	15,040	



	Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment
Run V1	13,000	3,900	5,100	4,900	3,700
Run V2	3,400	3,000	3,600	2,500	2,500
Run V3	3,100	2,900	2,700	3,400	2,600
Average	6,500	3,267	3,800	3,600	2,933

process, suggesting a destruction through the process. The trends on the lower graph in Figure 4-11 indicate a transfer of fluoranthene from the solid to the liquid phase.

4.3.6 Polychlorinated Biphenyl (PCB) Results

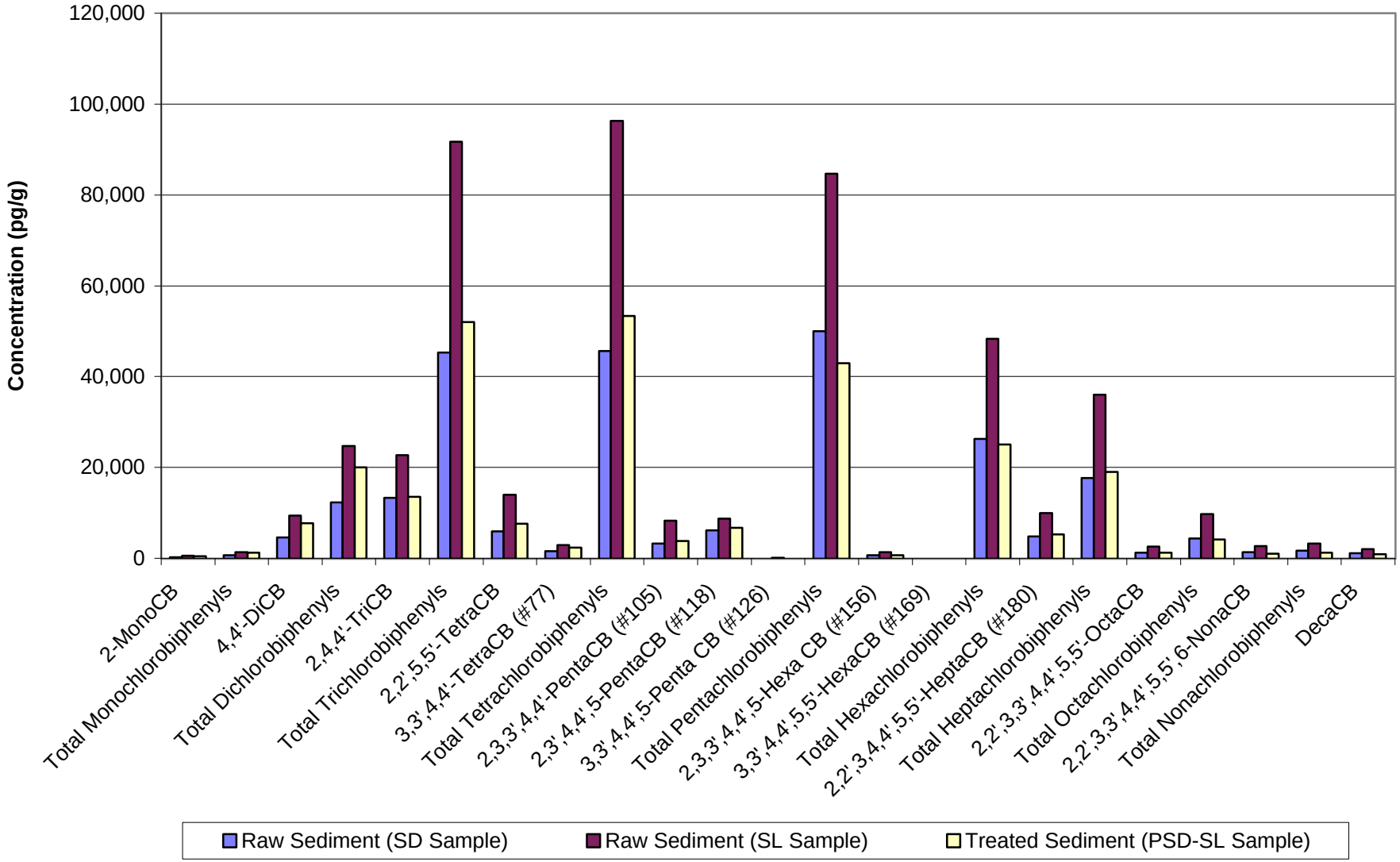
As presented in Section 3, samples collected during Process Validation were analyzed for PCBs using two different analytical procedures. Samples of the untreated (RAW) and treated (PSD) sediment were analyzed for PCB congeners using EPA Method 1668M and PCB aroclors using EPA Method 8082, while intermediate samples of the slurry throughout the process were only analyzed for PCB aroclors using EPA Method 8082. Figures 4-12 and 4-13 are graphs representing the average concentrations for PCB congeners and PCB aroclors, respectively, in the untreated (RAW) and treated (PSD) sediment during Process Validation activities. As previously discussed, analytical data shows an increase in PCB concentrations from the untreated sediment slurry (SD sample) to the solid fraction of the untreated sediments (SL sample). Based on a comparison of analytical results from the solid fraction of the untreated sediment and the treated sediment, the BioGenesis^{SM} Sediment Washing Process achieved an average of 40% reduction in PCB congeners and an average of 63% reduction in PCB aroclors. Individual removal percentages for the PCB congeners ranged from 16% (3,3',4,4'-tetrachlorobiphenyl) to 61% (2,2',3,3',4,4',5,5',6-nonachlorobiphenyl). Individual removal percentages for the PCB aroclors ranged from 33% (Aroclor 1254) to 92% (Aroclor 1260).

Analytical sample results for PCB Aroclor 1254 provided the most consistent results for PCBs throughout the BioGenesis^{SM} Sediment Washing Process during the Process Validation Phase. The fate of PCB Aroclor 1254 is considered representative of the fate of PCBs throughout the process

4.3.6.1 PCB Aroclor 1254

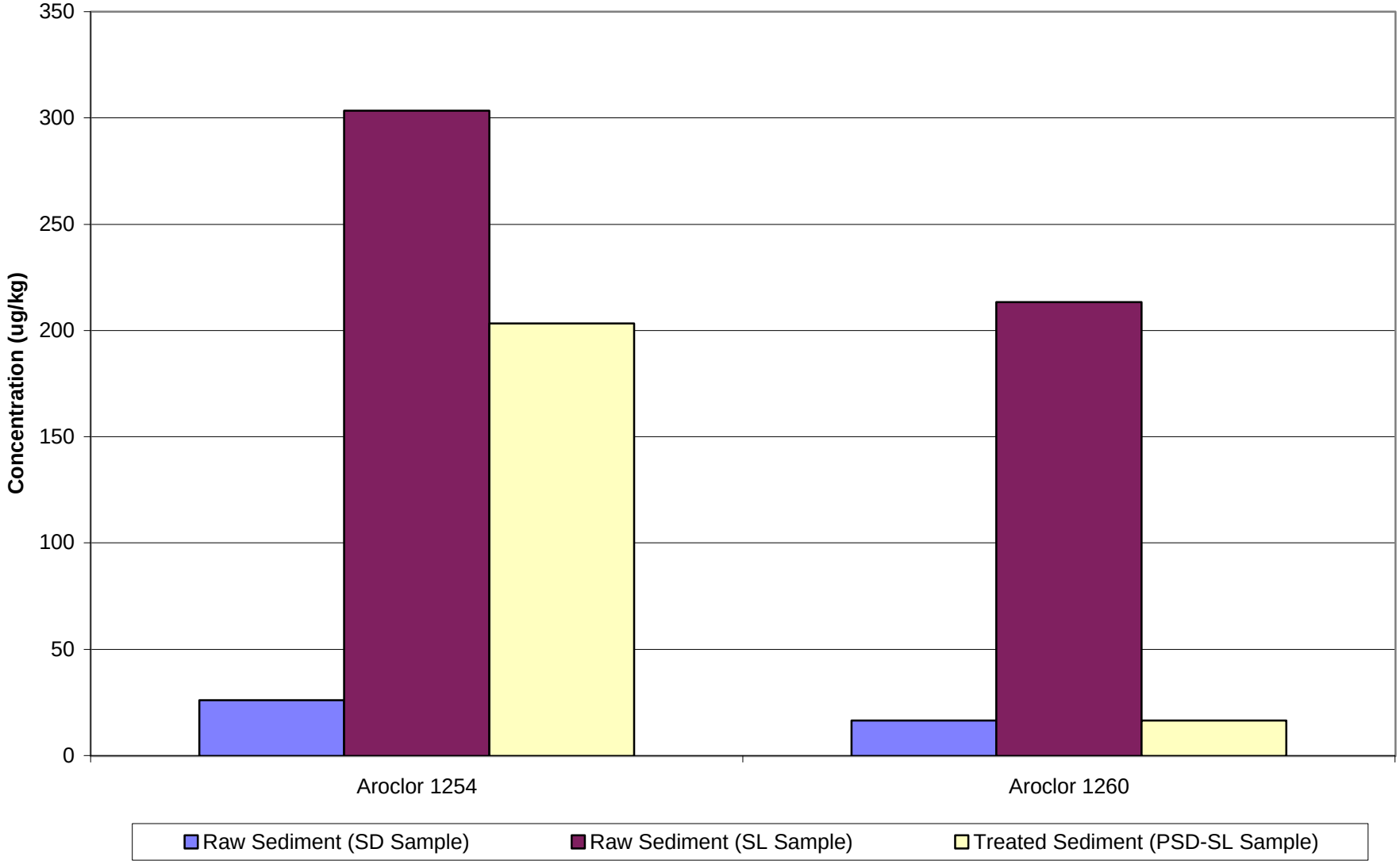
Aroclor 1254 was detected in one RAW sediment sample at a concentration of 45 ug/kg (two other samples were not detected above a detection limit of 33 ug/kg). After the sediment sample was separated using the bench-top centrifuge, Aroclor 1254 was detected at an average concentration of 303 ug/kg in the solid phase sample. Average aroclor 1254 concentrations in the treated sediment cake and centrate were 203 ug/kg showing a 33% reduction in Aroclor 1254

Figure 4-12 Process Validadtion Phase Results for PCB Congeners



Note: ND is taken as half the detection limit.

Figure 4-13 Process Validatation Phase Results for PCB Aroclors



Note: ND is taken as half the detection limit.

0031_SEC4_FIG_b.xls,PCB Aroclors

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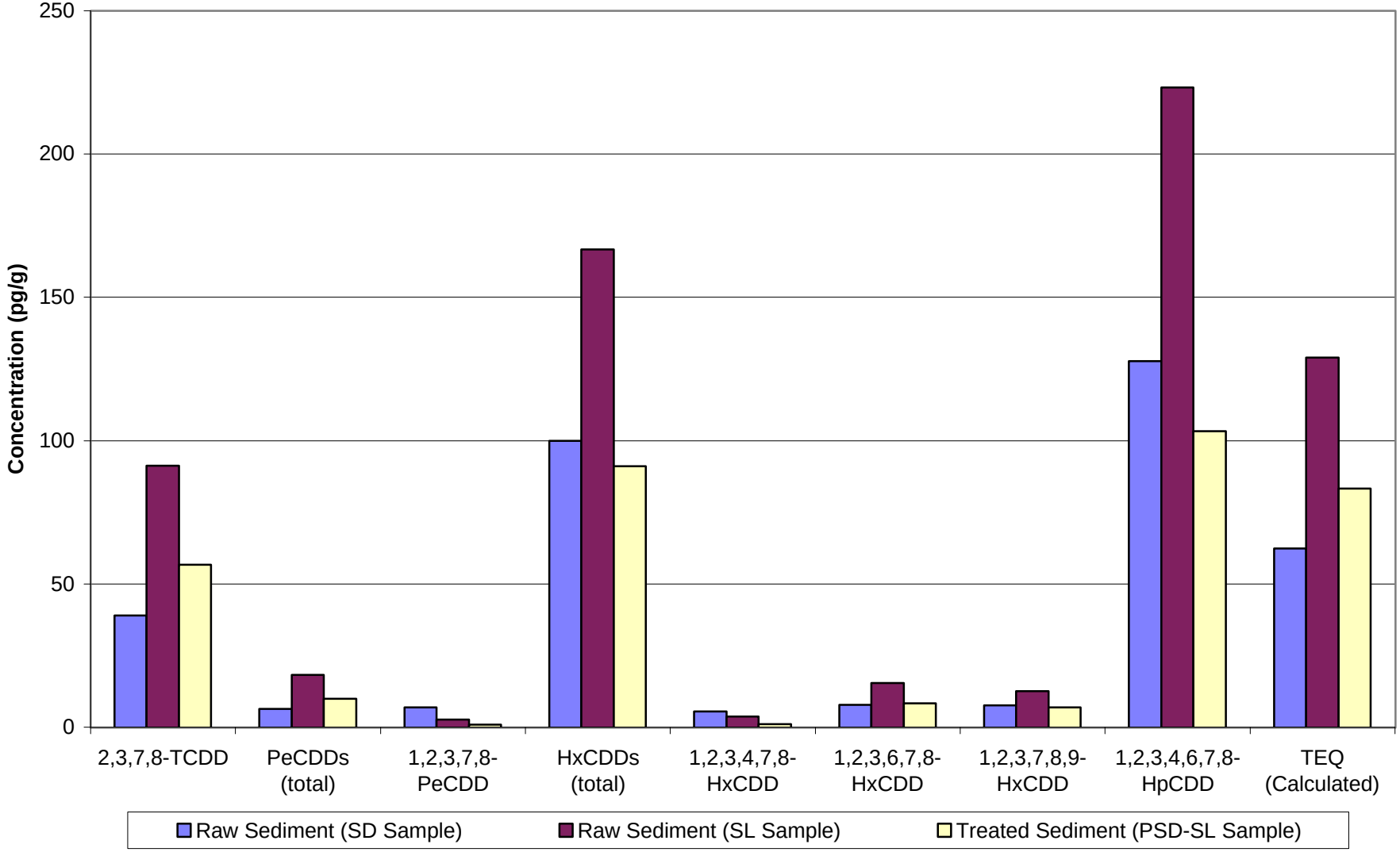
concentrations. The NJRDCSCC for total PCBs is 490 ug/kg. Two (2) of the three (3) samples collected of the solids in the centrate wastewater (PAQ-SL) exceeded this standard. No other samples collected during Process Validation (pre-treatment or post-treatment) exceeded this standard.

4.3.7 Dioxin/Furan Results

As presented in Section 3, samples of only the untreated (RAW) and treated (PSD) sediment collected during Process Validation sampling activities were analyzed for dioxin and furans. Intermediate samples of the slurry were not analyzed for dioxin and furans. Presented in Figure 4-14a, 4-14b, 4-15a, and 4-15b are graphs representing the average concentrations for dioxins and furans, in the untreated (RAW) and treated (PSD) sediment during the Process Validation activities. As previously discussed, analytical data shows an increase in dioxin and furan concentrations from the untreated sediment slurry (SD sample) to the solid fraction of the untreated sediments (SL sample). Based on a comparison of analytical results from the solid fraction of the untreated sediment and the treated sediment, the BioGenesis^{SM} Sediment Washing Process achieved an average of 62% reduction in the toxicity equivalency value (TEQ) for dioxins and furans. The TEQ was calculated using EPA procedures for calculating 2,3,7,8-TCDD equivalency values. Individual removal percentages for dioxins and furans ranged from 44% (1,2,3,6,7,8-HxCDF) to 82% (1,2,3,4,7,8-HxCDD).

Presented in Figure 4-16 are graphs of the mass balance calculations for TEQ values and trends observed in Process Validation data assessment. The upper graph shows a reduction in the calculated total TEQ mass through the process, suggesting a destruction through the process. Since intermediate samples were not analyzed for dioxin and furans, the trend lines on the lower graph in Figure 4-16 were developed based on the untreated and treated sediment data. The trend lines indicate an overall reduction in the mass of the TEQ value suggesting a destruction of dioxins and furans through the process.

Figure 4-14a Process Validation Phase Results for Dioxins



Note: ND is taken as half the detection limit.

0031_SEC4_FIG_b.xls,Dioxins

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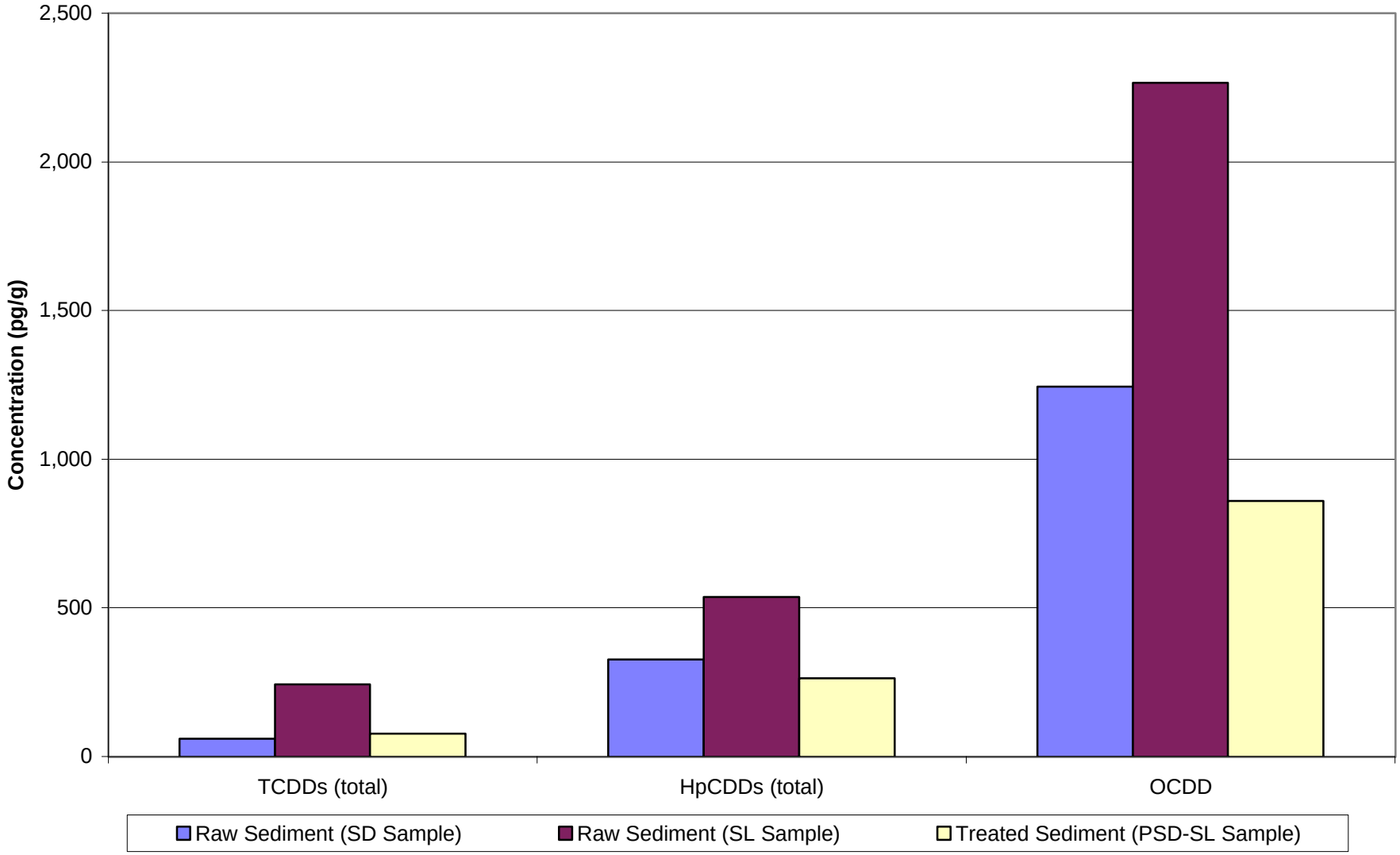
Figure 4-14b Process Validation Phase Results for Dioxins



Note: ND is taken as half the detection limit.

0031_SEC4_FIG_b.xls,Dioxins (2)

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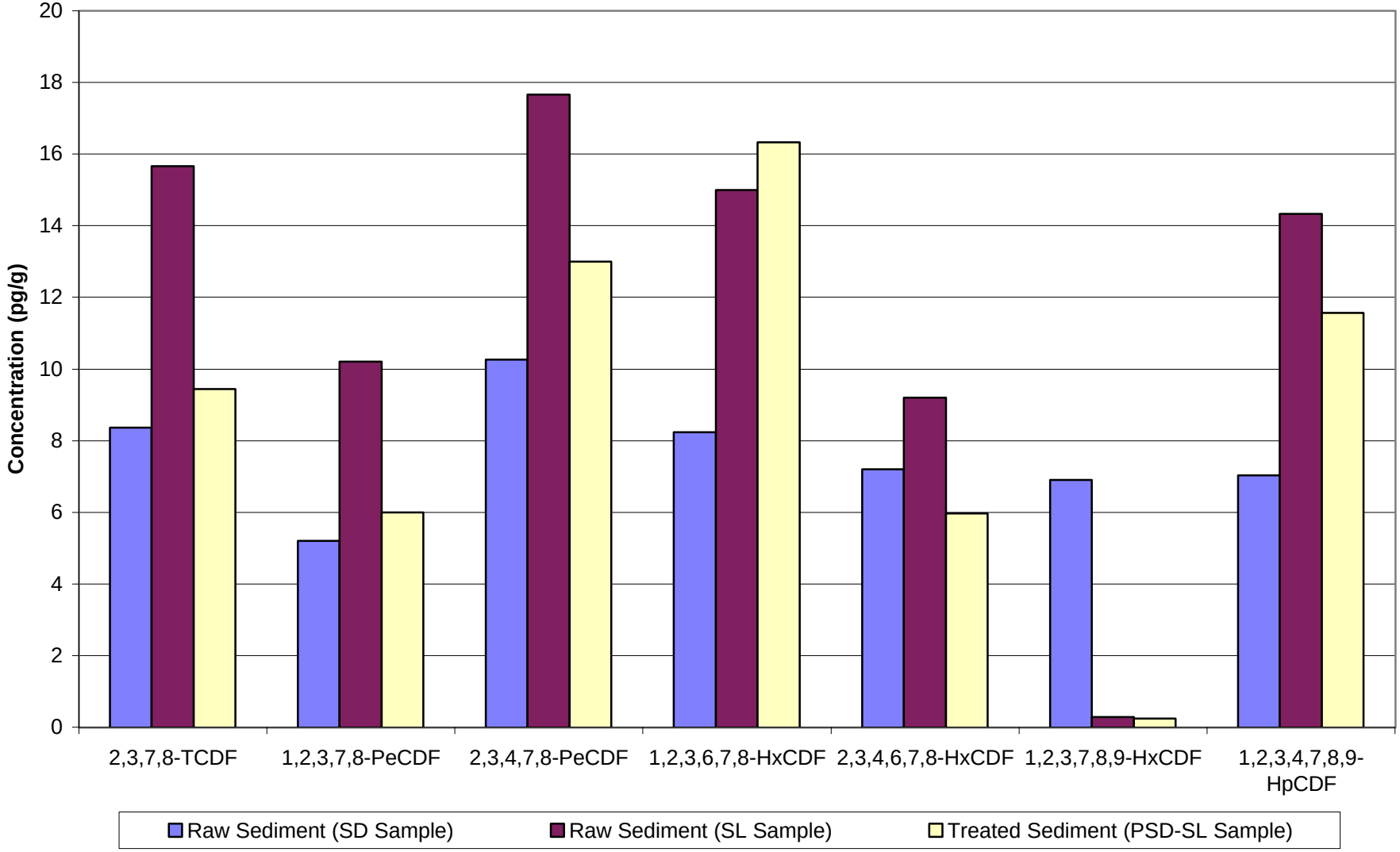
Figure 4-15a Process Validation Analytical Results for Furans



Note: ND is taken as half the detection limit.

0031_SEC4_FIG_b.xls, Furans

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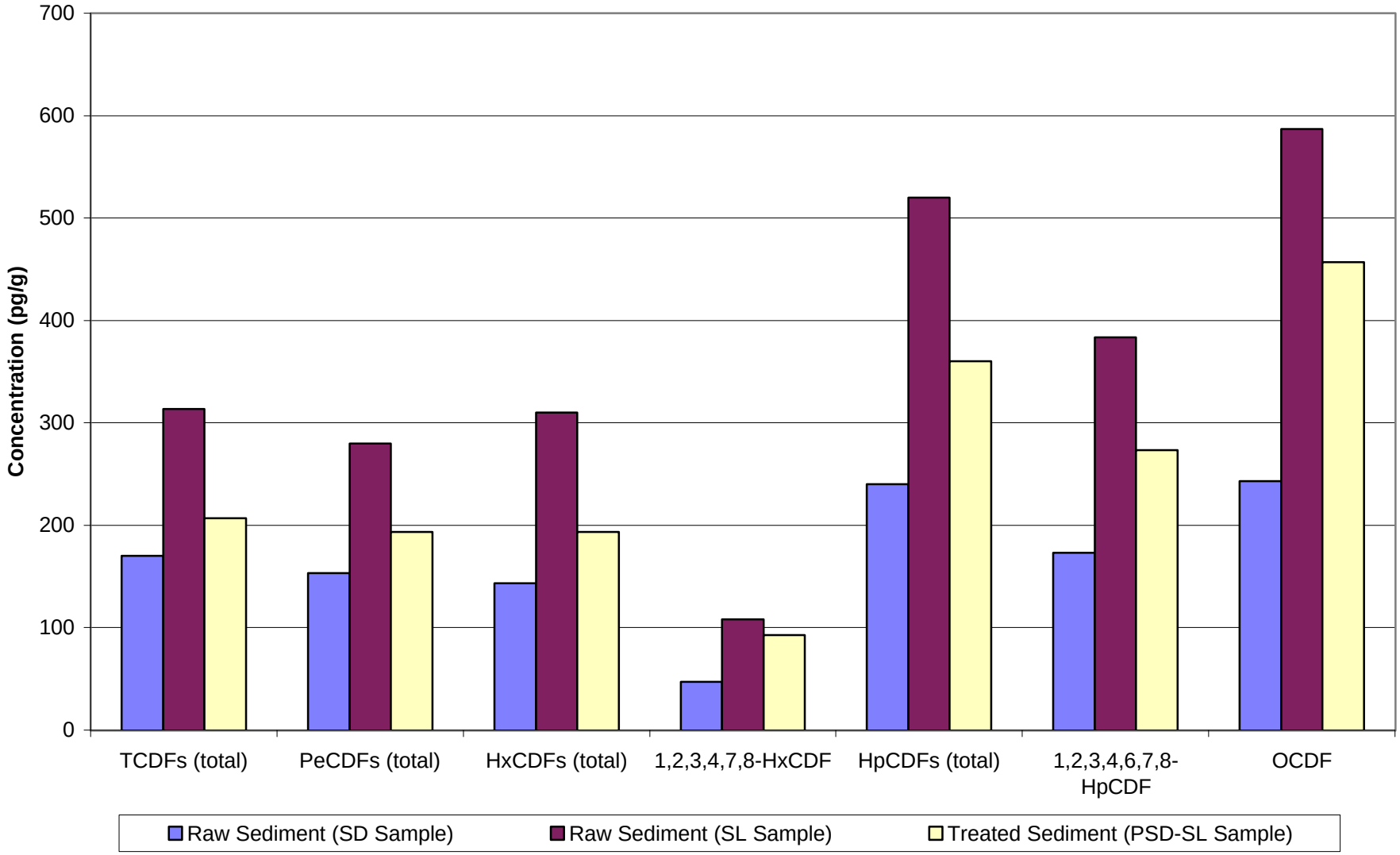
Figure 4-15b Process Validation Analytical Results for Furans



Note: ND is taken as half the detection limit.

0031_SEC4_FIG_b.xls, Furans (2)

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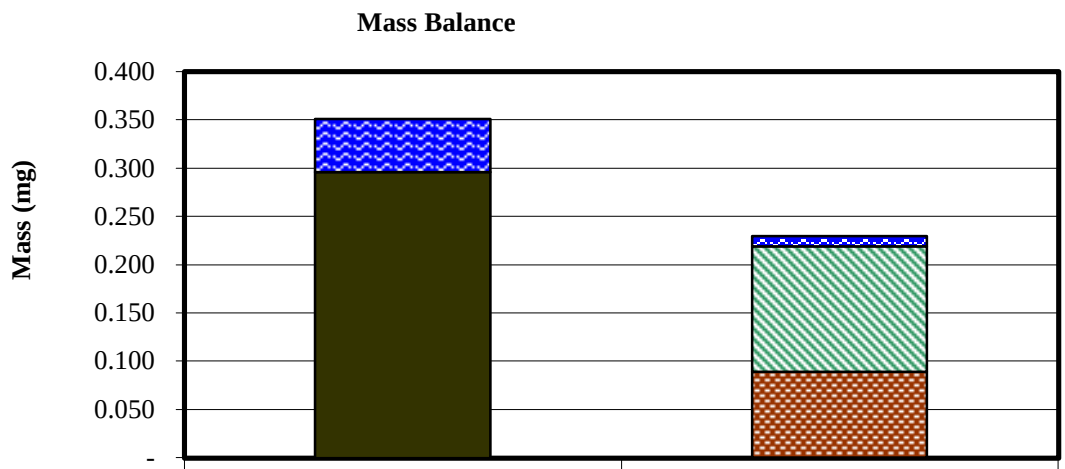
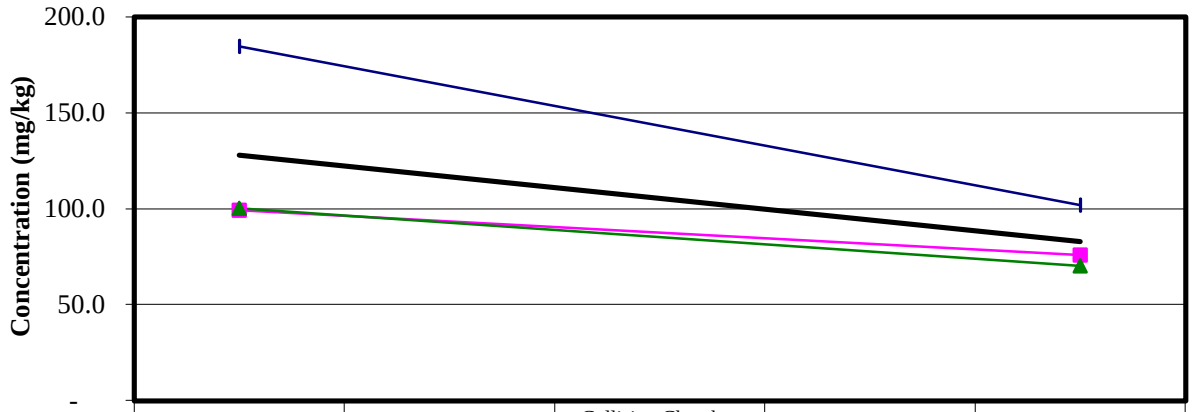
Figure 4-16 Mass Balance for Dioxin/Furan TEQ



	Total Process Inlets	Total Process Oulets
Mass of Dioxin/Furan TEQ in Liquids	0.055	0.011
Mass of Dioxin/Furan TEQ on Treated Solids		0.130
Mass of Dioxin/Furan TEQ on Solids in Centrate		0.089
Mass of Dioxin/Furan TEQ on Untreated Solids	0.296	



	Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment
Run V1	184.7				102.0
Run V2	99.0				75.8
Run V3	100.2				70.2
Average	128.0				82.7

4.3.8 Herbicide and Pesticide Results

Analytical results of samples collected during Process Validation activities showed no detectable levels of herbicides and low levels of pesticides. Presented in Figure 4-17 is a graph representing the average concentrations for detected pesticides in the untreated (RAW) and treated (PSD) sediment during Process Validation activities. As previously discussed, analytical data shows an increase in pesticide concentrations from the untreated sediment slurry (SD sample) to the solid fraction of the untreated sediments (SL sample). Based on a comparison of analytical results from the solid fraction of the untreated sediment and the treated sediment, the BioGenesis^{SM} Sediment Washing Process achieved an average of 35% reduction in detectable pesticides. Individual removal percentages for pesticides ranged from 15% (4-4'-DDT) to 51% (4,4'-DDE).

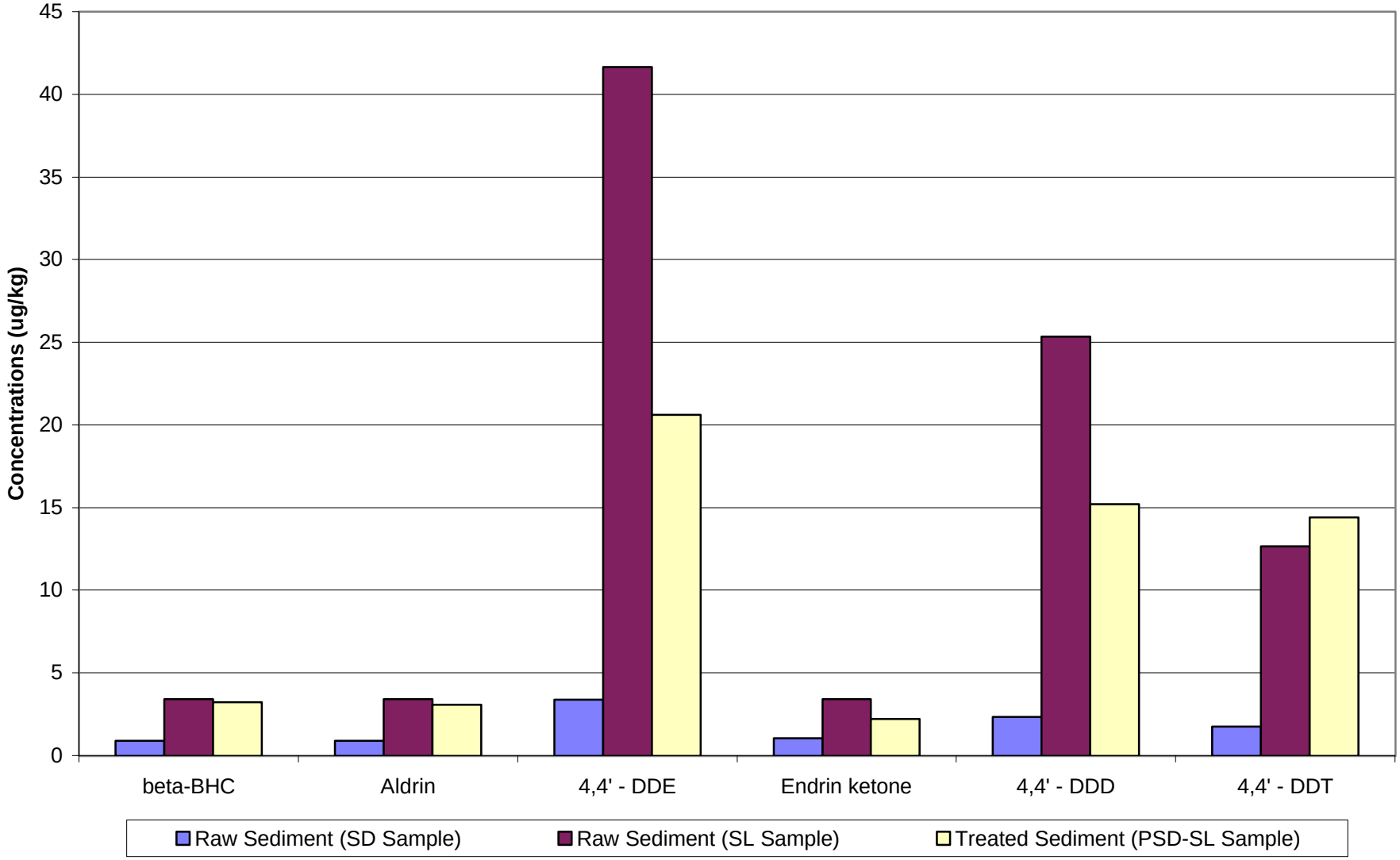
4.3.9 Air Sampling Results

Air samples were collected in the head space of the aeration unit and the raw sediment storage tanks to evaluate the potential loss of volatile organic compounds (VOCs) through volatilization. A summary of the air sampling results is provided in Appendix D, Table D-11. In general low levels of VOCs were detected in the head space above the aeration unit and the raw sediment storage tanks. A mass balance of the VOCs around the aeration unit could not be completed since the air sample results were very low and the no significant levels of VOCs were detected in the sediment slurry. The air data will be used for designing air treatment equipment for the full-scale process.

4.4 BENEFICIAL USE EVALUATION

The sediment that is dredged from the NY/NJ Harbor has unique characteristics that will make it a valuable resource once it has been decontaminated. Fine-grained sediment is desirable as an ingredient in topsoil, and course-grained sediment is desirable as an ingredient in construction backfill. With the addition of soil amendments like peat moss and sand, the decontaminated fine-grained sediment can be made into a salable soil product. With the addition of cement, the sediment can be used in the landscaping industry to create patio blocks or garden figurines.

Figure 4-17 Process Validation Analytical Results for Pesticides



Note: ND is taken as half the detection limit.

0031_SEC4_FIG_b.xls,Pesticides

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There are many products in which the decontaminated sediment can be used, including but not limited to:

- Building blocks
- Patio blocks
- Construction fill
- Ornamental figurines
- Landfill cover material
- Brownfields redevelopment
- Topsoil

Several studies have been conducted to evaluate the value of dredged material from the NY/NJ Harbor. This includes work performed by the USACE – Waterways Experiment Station (WES). WES has done extensive work evaluating and demonstrating manufactured soil beneficial end products on a large scale for low contamination sediments decontamination. Products that WES has investigated include, manufactured soil, mining reclamation, structural blocks, construction fill, ornamental figurines, etc. Because of a perceived difficulty in developing a salable product with contaminated dredged material, decontaminated sediments may be salable in the landscaping market.

In order to supplement the work done to date by others, BioGenesis performed a Beneficial Use Evaluation during the Pilot Demonstration Project to investigate a commercially viable end product that could be produced from decontaminated sediment during the full-scale operations (Phase 3 of the Sediment Decontamination Demonstration Program). The objective of the Beneficial Use Evaluation study was to gather information needed to develop at least one salable commercial product with the potential of obtaining an Acceptable Use Determination (AUD) from the NJDEP. The evaluation was accomplished using a systematic approach that involves:

- Bench-scale product formulation and testing
- Full-scale demonstration of blending procedures
- Market evaluation to determine the product needs of potential customers.

A report documenting the results of the Beneficial Use Evaluation will be prepared following the completion of the bench-scale studies. The following is a summary of the results to date:

- Bench-Scale Study – A bench-scale study was performed by Cornell University to design and test a planting medium which would include the decontaminated dredged material. Three end products were researched; landscape planting, turf establishment, and container usage. The test was designed to investigate the effects of varying amounts of dredged material mixed with other soil amendments on chemical and physical properties of the soil as well as growth testing.

  Because of the ability to grow from seed to maturity in one month and the availability of standard growth protocols, lettuce was used for the study. Daily observations were made and once fully grown, the lettuce was harvested, dried, ground, and tested for heavy metals and organics. Some of the lettuce heads were frozen and are awaiting laboratory analysis for contaminant uptake. The lettuce heads were also weighed to determine whether the dredge material had an effect on growth. It was shown that mixing the dredge material with a peat-perlite media at rates ranging from 0-25% had no effect on the weight of the lettuce. It would appear that the addition of dredged material into the soil product has no negative impacts. Final conclusions, however, cannot be made until the analytical data has been carefully reviewed.

- Market Analysis – The market analysis focused on the salability and marketability of a topsoil product using the decontaminated dredged material. The wholesale market was a primary focus as this market is readily accessible. The private label market is also a consideration of this study, but this market requires additional private market capital investment. Factors taken into account for this study include:

  - Comparable quality to currently available products
  - Packaging of product (for use in the private label market)
  - Introduction of the new product into the market
  - Sales effort
  - Government regulation of market

The result of the Market Analysis is that there is a viable market for this material in both bulk and bags. The private label market for a bagged product is estimated to be approximately 15-18 million bags per year in the regional area of NY and NJ. There are significant numbers of buyers of bulk and bagged material present in the NY/NJ area and range from those who may purchase several hundred cubic yards per year to several thousand. Market survey results indicate that the regional bulk wholesale market for top soil could be as high as six (6) million cy per year. Packaging would be required if the product were to be sold on the private label market, but if the

wholesale market is utilized, it would be transported in bulk. Initially the product could be marketed regionally for the NY and NJ area. By teaming with a national distributor, it is possible to market this product throughout the United State and including Canada.

5. FUTURE ACTIVITIES

The ultimate objective of the WRDA Program is to establish one or more technologies/firms with the capability to commercially decontaminate 500,000 cy of contaminated dredged materials annually from the NY/NJ Harbor in a cost effective and environmentally responsible manner. Towards this objective, BNL has contracted BioGenesis (BNL Contract No. 725044) to conduct a three phase Sediment Decontamination Demonstration Project:

- Phase 1 – Pilot Demonstration Project
- Phase 2 – Full-Scale Plant Design and Construction
- Phase 3 – Full-Scale Operations of 10,000 to 15,000 cy

During this project, BioGenesis demonstrated the ability to reduce organic and inorganic concentrations in sediment from the Stratus Petroleum Site. In addition, pilot scale process equipment was evaluated and engineering data was obtained for scale-up design. In order to proceed to Phases 2 and 3 of the BioGenesis Sediment Decontamination Demonstration Program, the following challenges need to be addressed to ensure that the BioGenesis^{SM} Sediment Washing Technology is a viable system to decontaminate dredged materials from the NY/NJ Harbor:

- Compare and contrast the physical and chemical properties of the pilot study dredged material from Stratus Petroleum to the physical and chemical properties of typical NY/NJ Harbor federal navigation channel dredged material. Based on this comparison, extrapolate the performance results of the Pilot Demonstration Project to expected full-scale system effectiveness.
- Develop a plan for the beneficial use of the treated sediment which provides positive cash flow to offset decontamination costs.
- Project treatment costs for full-scale and commercial-scale operations including startup costs.
- Select a site for Phase 3 – Operations and future commercial-scale operations.
- Identify source material and funding for the initial project(s).

The following subsections address these challenges for future activities.

5.1 COMPARISON OF PILOT STUDY SEDIMENT TO TYPICAL NY/NJ HARBOR SEDIMENT

As discussed in Section 1.4 of this report, the NY/NJ Harbor sediments contain a wide variety of organic and inorganic contaminates primarily due to long-term historical and current industrial activities in New Jersey and New York. Presented in Table 5-1 are the average physical characteristic and analytical results for the homogenized, raw dredged material for the pilot project compared to typical ranges for NY/NJ Harbor federal navigation and private berthing maintenance dredged material. In general, this table shows the pilot material to be very fine grained and have concentrations of organic and inorganic contaminants on the low end of the range for typical NY/NJ Harbor dredged material.

The difference between typical NY/NJ Harbor dredged material characteristics and those of the Stratus Petroleum dredged material is significant. In general, a higher level of effort (i.e., treatment time, chemical doses, energy, etc.) is required to treat low concentration, fine-grained material because the contaminants are tightly bound to the fine-grained material. This was also observed during bench-scale testing performed by BioGenesis prior to the Pilot Demonstration. The challenge of the Pilot Demonstration Project was therefore, decontaminating very fine-grained dredged material with low levels of contamination.

The Pilot Demonstration Project showed that the BioGenesis^{SM} Sediment Washing Process is effective in reducing organic and inorganic concentrations in the fine grained Stratus Petroleum dredged material. This material, based on a comparison to typical dredged material, represented a conservative scenario for future operations with typical NY/NJ Harbor sediment. Removal efficiencies achieved during the pilot study were, on an average, greater than 50%. Based on Testing Phase results, higher removal percentages can be achieved, if required, with higher chemical doses and additional treatment time. The overall removal/destruction results depend on grain size, initial contaminate concentration levels, total organic carbon content and processing system operating conditions (i.e., chemical addition rates, etc.). Therefore, it is projected that the BioGenesis^{SM} Sediment Washing Technology can effectively decontaminate sediment from the NY/NJ Harbor to acceptable regulatory soil standards with less effort.

Table 5-1

Comparison of Pilot Study Dredged Material to Typical Ranges of NY/NJ Harbor Federal Navigation and Private Berthing Maintenance Material

Selected Chemical Physical Characteristics	Typical Range NY/NJ Harbor Federal Navigation Sediment[1]	Pilot Demonstration Project Raw Sediment (Average)
Dioxins/Furans (pg/g)		
2,3,7,8-TCDD	0-529	39.0
TCDD/TCDF TEQ	61-224	57.5
Total PCBs (mg/kg)	0.05-3.32	0.205
PAHs (ug/kg)		
Anthracene	233-57,500	ND (<330)
Benzo(a)anthracene	151-23,400	ND (<330)
Benzo(a)pyrene	214-19,400	ND (<330)
Chrysene	175-23,500	ND (<330)
Fluoranthene	233-57,500	ND (<330)
Total PAHs	2,000-306,000	277
Pesticides (ug/kg)		
4-4'-DDD	0.1-2,070	2.9
4-4'-DDE	2-250	3.3
Metals (mg/kg)		
Arsenic	4-97	11.4
Cadmium	0.2-73	2.6
Chromium	15-245	132
Lead	17-580	137
Mercury	0.2-13.6	3.1
Nickel	10-870	32.3
Silver	0.15-16	2.3
Zinc	41-625	244
Grain Size Distribution		
Sand (>0.0625 mm)	4% - 28%	6%
Silt (0.0039 to 0.0625 mm)	36%-84%	52%
Clay (<0.0039 mm)	12%-36%	42%

[1] Reference for dioxins/furans, total PCBs, PAHs, pesticides, herbicides, and metals: Reiss, 1999. Reference for grain size distribution: PANY/NJ, 1996.

5.2 BENEFICIAL USE OF DREDGED MATERIAL

Decontaminated sediment from the NY/NJ Harbor can become a valuable resource. BioGenesis proposes to use decontaminated sediment from the BioGenesis^{SM} Sediment Washing Process as an amendment to manufactured soil products. A beneficial use bench study has been performed to determine the viability of using sediment in a manufactured soil product, and a market evaluation has been conducted to show the marketability of that manufactured soil product. The preliminary results of theses studies have indicated that a salable product could be produced from decontaminated sediment from the NY/NJ Harbor.

In order to be able to market the soil product manufactured from dredged materials in New Jersey, BioGenesis and WESTON will need to apply for and receive an AUD from the State of New Jersey. It is BioGenesis and WESTON's intent to propose a "sliding scale" series of treatment goals, each with specific acceptable end products, under an AUD for the full-scale facility. This "sliding scale" could resemble a low-concentration goal such as NJRSCC for unlimited use, a mid-concentration goal such as NJNRSCC for limited use (landfill cover, brownsfield redevelopment, etc.) and a maximum concentration goal above which the material could not be beneficially used and will require disposal.

The results of the Pilot Demonstration Project have shown that the level of decontamination of the sediment depends on the amount of treatment effort applied (i.e., treatment time, chemical dose, energy, etc.). During full-scale operations, an economic evaluation of system performance will drive the amount of treatment and resulting end product. In other words, the value of each end product will be weighed against the operational cost to achieve the treatment goal for that end product and a decision on level of treatment will be based on the lowest overall cost.

5.3 FULL-SCALE SITE LOCATION

BioGenesis has leased a 27 acre site in South Kearny, New Jersey from the BASF Corporation as the location for Phase 3 – Operations of the BioGenesis Sediment Decontamination Demonstration Project and future commercial-scale operations. The site is a vacant, demolished manufacturing facility, which is a candidate for brownfields redevelopment activities.

5.4 SOURCE MATERIAL FOR PHASE 3 – OPERATIONS

In fulfillment of a requirement of BNL Contract No. 725044, BioGenesis, in conjunction with WESTON, the WRDA Program, and the State of New Jersey, identified the following two sources of potential dredged material for Phase 3 of the BioGenesis Sediment Decontamination Demonstration Project in a letter to BNL dated 1 March 1999:

- NJDEP, USACE, *Joseph G. Minish Passaic River Waterfront Development Park Project*. The USACE received bids for this project on August 25, 1999. During the bulkheading work, approximately 1,650 cy of contaminated dredged material will be excavated from the Passaic River. The future BioGenesis/WESTON full-scale facility was named in the USACE's bid documents as the disposal facility for the contaminated dredged material. BioGenesis/WESTON are currently negotiating a contract with the successful bidder.

- New Jersey Office of Maritime Resources (NJMR), *Sediment Decontamination Demonstration Project*. BioGenesis and WESTON were notified in December 1998 by the NJMR that they have been selected to perform a sediment decontamination project on 30,000 to 150,000 cy of dredged material from the NY/NJ Harbor. BioGenesis/WESTON are currently negotiating the terms of a contract for this work. It is anticipated that this project will include the decontamination of approximately 80,000 cy of dredged material from the NY/NJ Harbor.

The combination of these projects represents a significant increase in scope to the original 10,000 to 15,000 cy demonstration in Phase 3 of the BioGenesis Sediment Decontamination Demonstration Project. The goals of the NJMR program are complimentary to the WRDA program in that both have an ultimate goal of having commercial-scale facilities operating in the NY/NJ Harbor region capable of decontaminating 500,000 cy of dredged material per year. Given these similarities, the WRDA Program and NJMR will work closely to integrate the projects for the BioGenesis^{SM} Sediment Washing Technology to move quickly to their mutual programmatic goal of "fast-tracking" proven, reliable and economically viable sediment decontamination technologies. Based on the results of the Pilot Demonstration Project and the plan for proceeding forward presented in this report, the BioGenesis^{SM} Sediment Washing Technology has been demonstrated to be a viable decontamination technology for rapidly moving to Phase 3 and ultimately to commercialization.

5.5 COST PROJECTIONS

Financial projections of treatment costs for the full-scale BioGenesis^{SM} Sediment Washing Process facility have been made based on the results of the Pilot Demonstration Project. A summary of the projected treatment costs for the initial 80,000 cy demonstration project under the integrated WRDA/NJMR program along with future commercial-scale (500,000 cy/yr) treatment costs is presented in Table 5-1 and graphically represented in Figure 5-1.

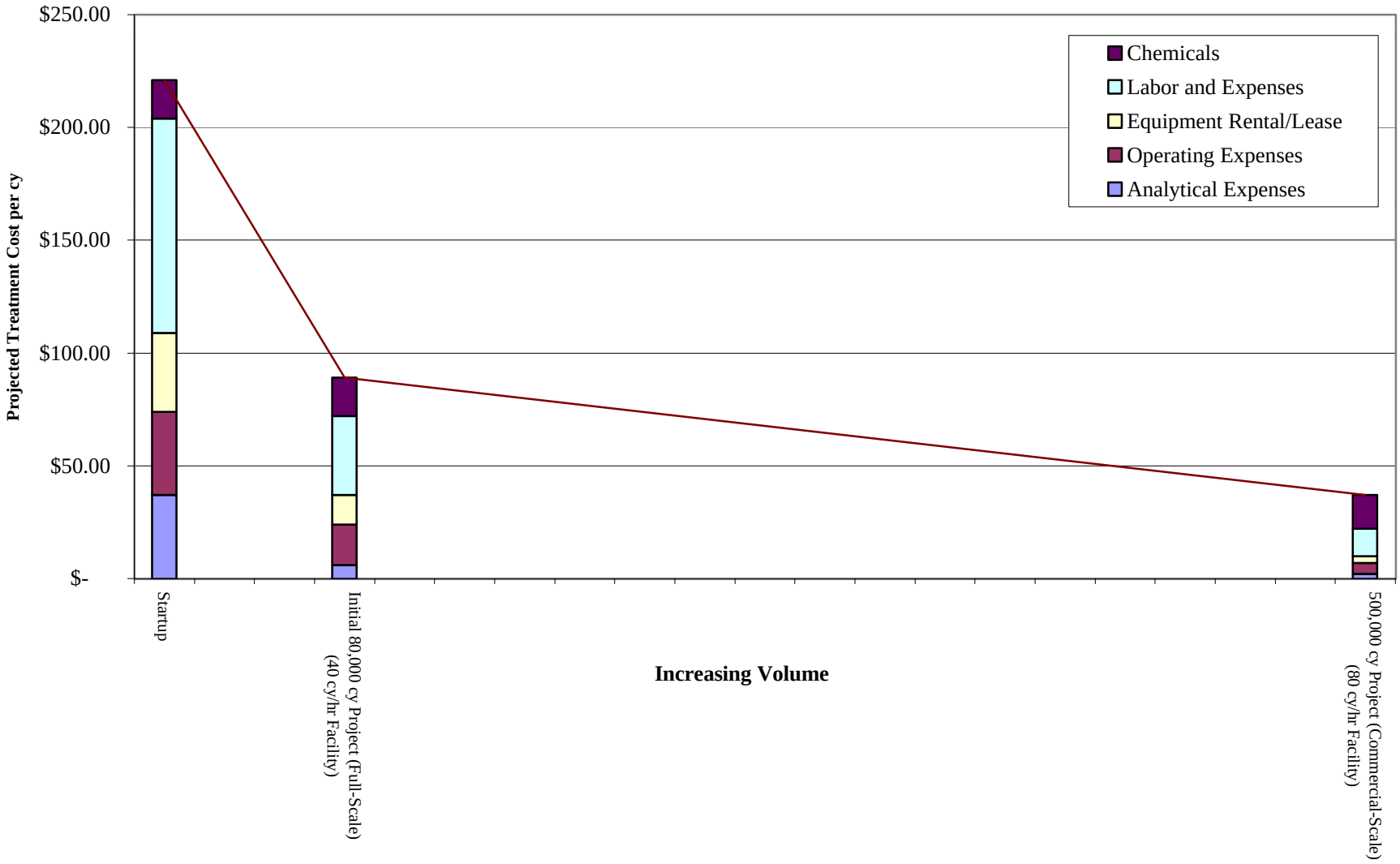
Current treatment cost projections for the initial project are based on a 40 cy/hr facility operating at an average online efficiency beginning at 25% during startup reaching 80% after approximately four months of operations. Future treatment cost projections are based on an 80 cy/hr facility operating at an average online efficiency of 80%. The current and future cost projections have taken into account a nominal value for sale of a soil manufactured from the treated sediment. The actual costs for treatment will partially depend on the market value for the manufactured soil and beneficial use products developed and therefore a cost range is currently presumed for the operating expenses that include the beneficial use sale of the manufactured soil products for the future 80 cy/hr facility.

Table 5-2

Cost Projections

	WRDA/NJMR Demonstration Project 80,000 cy (40 cy/hr Facility)	**Commercial-Scale Facility 500,000 cy/yr (80 cy/hr Facility)**
Analytical Costs	$6/cy	$2 /cy
Operating Expenses Field Offices Utilities Maintenance Waste Disposal Beneficial Use Sale	$18/cy	$3-9 /cy
Equipment Rentals/Lease	$13/cy	$3 /cy
Labor and Expenses Union Labor Management Labor	$35/cy	$10 /cy
Chemical Costs	$17/cy	$11 /cy
Total "Tipping Fee"	$89 /cy	$29-35 /cy

Figure 5-1 Projected Treatment Costs



0031_F5-1.xls Chart1

6. CONCLUSIONS AND RECOMMENDATIONS

The objectives of the Pilot Demonstration Project were to evaluate the effectiveness of the BioGenesis^{SM} Sediment Washing Process, evaluate pilot equipment performance, collect data for the scale-up design, and validate pilot system performance. These objectives were met during the Pilot Demonstration Project. The following is a summary of the results.

6.1 PILOT SYSTEM TESTING

During Pilot System Testing, a total of 50 batches of sediment were processed through the pilot BioGenesis^{SM} Sediment Washing Process at varying operating conditions. Samples of the sediment slurry were collected at the unit operations throughout the washing process to evaluate the effect of the variation on contaminant removal. The following is a summary of the Pilot System Testing results:

- Pre-Processor – Analytical testing across the pre-processor did not show any significant changes in chemical concentrations as a function of tested operating conditions as expected. The optimum operating conditions for the pre-processor were set, therefore, based on bench-scale data, feasibility for full-scale operations, and visual observations of the homogeneity of the sediment slurry.

- Aeration Unit – The aeration unit did not recover floatable organic materials during the Pilot Demonstration Project. It is expected that full-scale operations may encounter recoverable, floatable organics, therefore future operations will include the Aeration Unit.

- Sediment Washer – The Sediment Washer operated as expected during the Pilot Demonstration Project. Analytical results indicated the organic and inorganic contaminants were transferred to the liquid phase in the Sediment Washer. Based on the results of the multiple test runs, lower levels of contaminants can be achieved in the treated sediment using multiple passes or multiple collisions.

- Cavitation/Oxidation Unit – The cavitation/oxidation unit achieved destruction of organic contaminants. The effectiveness of the unit was limited by the amount of oxidant which could be added, based on the limitations of the pilot scale equipment, during the Pilot Demonstration Project. During Pilot System Testing, the unit did not achieve repeatable destruction efficiencies, and subsequently, the oxidant addition rate was increased during Process Validation (see Section 4.3). Full-scale operations will need the ability to adjust oxidant addition rates and adjust cavitation time.

- Liquid/Solid Separation – During the Pilot Demonstration Project, a hydrocyclone and low speed horizontal bowl centrifuge were used to separate the treated sediment from the contaminated water phase. Probably due to the up front screening activities and the very fine grain nature of the sediment, the hydrocyclone did not separate any large particles in the sediment slurry. The low speed centrifuge produced a cake at 60 to 70% solids without the addition of flocculent. The centrifuge had a 50% cut point at approximately 8 microns. Given the grain size distribution of the dredged material treated in the project, this resulted in recovery of approximately 72% of the sediment particles in the centrifuge cake. A high speed centrifuge, tested on the centrate from the low speed centrifuge, showed additional solids can be recovered at higher speeds. Full-scale operations will need the ability to vary centrifuge operations to control sediment recovery rates.

6.2 PROCESS VALIDATION

During Process Validation, several batches were processed at similar operating conditions, and three sets of samples of the sediment slurry were collected throughout the process to validate the operation of the BioGenesis^{SM} Sediment Washing Process. The three sets of samples were used to show repeatability of the process. The following is a summary of the Process Validation results:

- Metals – The BioGenesis^{SM} Sediment Washing Process achieved an average of 54% reduction in metals during the Pilot Demonstration Project. Individual removal percentages for metals ranged from 8% (thallium) to 92% (mercury).

- PAHs – The process achieved an average of 41% reduction in detectable PAH concentrations during the Pilot Demonstration Project. Individual removal percentages for detectable PAHs ranged from 25% (benzo(k)fluoranthene) to 78% (phenanthrene).

- PCBs – The process achieved an average of 40% reduction in PCB congeners and an average of 63% reduction in PCB aroclors during the Pilot Demonstration Project. Individual removal percentages for the PCB congeners ranged from 16% (3,3',4,4'-tetrachlorobiphenyl) to 61% (2,2',3,3',4,4',5,5',6-nonachlorobiphenyl). Individual removal percentages for the PCB aroclors ranged from 33% (Aroclor 1254) to 92% (Aroclor 1260).

- Dioxins and Furans – The process achieved a 62% reduction in the average TEQ values for dioxins and furans during the Pilot Demonstration Project. Individual removal percentages for dioxins and furans ranged from 44% (1,2,3,6,7,8-HxCDF) to 82% (1,2,3,4,7,8-HxCDD).

- Pesticides – The process achieved an average of 35% reduction in detectable pesticides during the Pilot Demonstration Project. Individual removal percentages for pesticides ranged from 15% (4,4’-DDT) to 51% (4,4’-DDE).

- TOC – The process achieved an average of 51% reduction in TOC concentrations during the Pilot Demonstration Project.

6.3 SUMMARY CONCLUSIONS AND RECOMMENDATIONS

The following conclusions can be drawn from the results of the Pilot Demonstration Project of the BioGenesis^{SM} Sediment Washing Technology discussed in this report:

- The BioGenesis^{SM} Sediment Washing Technology can effectively reduce concentrations of organic and inorganic contaminants from NY/NJ Harbor dredged materials to regulatory soil standards for beneficial use.
- The BioGenesis^{SM} Sediment Washing Technology pilot-scale equipment has the ability to adjust the level of treatment by varying retention times, chemical addition ratios, etc. This agrees with results from previous bench-scale testing conducted under the WRDA Program (BioGenesis, 1998).
- Treated sediment can be beneficially used in a manufactured soil product which can be marketed in the NY/NJ Harbor area.
- BioGenesis has leased a site in Kearny, NJ for Phase 3 – Operations and future commercial-scale activities.
- As required under BNL Contract No. 725044, BioGenesis has identified sources of material for Phase 2 and 3 activities.
- BioGenesis and WESTON have joined to perform Phase 2 and 3 activities for the collaboration of the NJMR and WRDA programs.
- Financial projections of commercial-scale operations indicate the BioGenesis^{SM} Sediment Washing Process can be an economically viable solution for management of NY/NJ Harbor dredged material at a treatment cost of $29-35 per cy.

Based on these conclusions BioGenesis and WESTON recommend the BioGenesis^{SM} Sediment Washing Technology proceed to Phases 2 and 3 of the Sediment Decontamination Demonstration Project.

7. REFERENCES

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WESTON, 1999 – *Work Plan, BioGenesis^{SM} Sediment Decontamination Demonstration Project, New York/New Jersey Harbor.* Roy F. Weston, Inc, January, 1999.

APPENDIX A

APPROVALS AND PERMITS

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES

P.O. Box 5000
Upton, New York 11973-5000

TEL: (516) 344- 4588
FAX: (516) 344- 5271
E-MAIL: kwj@bnl.gov

Department of Applied Science
Building 901A

February 25, 1999

John Sontag
Roy F. Weston, Inc.
1 Weston Way
West Chester, PA 19380-1499

FAX: 610-701-7597

Reference: Contract No. 725044

Dear John:

Thank you for sending the draft BioGenesis/Weston Work Plan/Health and Safety Report. We have made an initial review of the content and find that it satisfies our requirements for the Contract Milestone 2 (Complete/Approval of Work Plan/HASP).

You are therefore authorized to invoice BioGenesis who will then invoice BNL for $100,000 for completion of this work.

I will inform you if, upon further review, any changes need to be made before the report is made final.

Sincerely yours,

Keith

Keith W. Jones
Manager
Sediment Decontamination Technology Project

KWJ:lmb

Copies to:
C. L. Wilde - BioGenesis
E. A. Stern - US EPA

ORIGINAL WILL BE MAILED

HUDSON COUNTY IMPROVEMENT AUTHORITY
2 Journal Square Plaza - 8th Floor
Jersey City, N.J. 07306

(201) 795-4555
Fax (201) 795-0240

Commissioners
John L. Shinnick, Chairman
Martin A. Budinick, Vice Chairman
Frank M. Vaccarino, Esq., Treasurer
Loretta E. McKnight, Secretary
James E. Byrnes
Thomas E. Donnelly
John J. Duffy

County Executive
Robert C. Janiszewski

Executive Director
Thomas P. Calvanico, Esq.

September 11, 1998

Frank G. Capece, Esq.
Waters, McPherson, McNeill, P.C.
300 Lighting Way
P.O. Box 1560
Secaucus, New Jersey 07096

Re: BioGenesis Demonstration Project
Koppers Seaboard Site

Dear Mr. Capece:

This letter will formally confirm the Hudson County Improvement Authority's consent and authorization for Roy F. Weston, Inc., and SK Services, Inc., along with BioGenesis Enterprises, Inc. to perform a pilot scale demonstration of the BioGenesis Sediment Decontamination technology. This demonstration shall be conducted on a portion of the parking area at the Koppers Seaboard site.

Very truly yours,

HUDSON COUNTY
IMPROVEMENT AUTHORITY

By: S/ Thomas P. Calvanico
Thomas Calvanico, Executive Director

TC/

203027.1

PRINTED ON RECYCLED PAPER

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection

Robert C. Shinn, Jr.
Commissioner

Site Remediation Program
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625
(609) 292-1250
FAX (609) 777-1914

December 18, 1998

Mr. John G. Sontag
Roy F. Weston, Inc.
1 Weston Way
West Chester, Pennsylvania 19380

RE: Stream Encroachment Permit
Application No: 0907-91-0006.12
Project: BioGenesis Sediment Washing
Kearny Town, Hudson County

Dear Mr. Sontag:

Enclosed, please find an approved Stream Encroachment Permit for the above referenced project. Please review this permit and note any conditions which may have been imposed, and have the applicant promptly complete and return the enclosed "Acceptance of Revocable Construction Permit/s" form to the Department at the above address. This approval is valid for five years from the date of the permit and all terms and conditions of the permit/s are detailed therein. Please note that the permittee must give notice of initiation of construction using the enclosed "Construction Report" form. Notice must be given at least 14 days prior to initiation of construction. Upon completion of construction, the "Completion Report" form must also be completed and submitted to the above address.

Any person who considers himself and herself aggrieved by this permit decision may request a hearing by addressing a written request for such hearing to the following address: Office of Legal Affairs, Department of Environmental Protection, P.O. Box 402, Trenton, New Jersey 08625-0402, Attention Adjudicatory Hearing Requests. This written request must include a completed copy of the attached Administrative Hearing Request Checklist and all information identified in Section III of that list.

In order to promote inter-governmental cooperation in the management of our natural resources, a copy of this decision shall be shared with appropriate local and federal agencies. Should you have any questions in this regard, please do not hesitate to contact me at (609) 292-8838.

Sincerely,

Lawrence J. Baier

Lawrence J. Baier, Chief
Office of Dredging and Sediment Technology
Site Remediation Program

Enclosures

C: Frank McDonough, Office of Maritime Resources
Paul Tuminello, U.S. Army Corps of Engineers, New York District
Operations Division, Jacob K. Javits Federal Bldg, NY, NY 10278-0090
Eric A. Stern, U.S. Environmental Protection Agency, Region 2
290 Broadway, 24th Floor, NY, NY 10007-1866

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ADJUDICATORY HEARING REQUEST CHECKLIST AND TRACKING FORM

I. Permit Being Appealed:

_____
Facility Name

_____ _____
Issuance Date of Final Permit Decision Permit Number

II. Person Requesting Hearing:

_____ _____
Name/Organization Name of Attorney (if applicable)

_____ _____
_____ _____
_____ _____
Address Address of Attorney

_____ _____
Telephone Number Telephone Number of Attorney

III. Please include the following information as part of your request:

A. The date the permittee received the permit;
B. A copy of the Denial of Permit and a list of all issues being appealed;
C. The legal and factual questions at issue;
D. A statement as to whether you raised each legal and factual issue during the public comment period;
E. An estimate of the amount of time required for the hearing;
G. A request, if necessary, for a barrier-free hearing location for disabled persons;
H. A clear indication of any willingness to negotiate a settlement with the Department prior to the Department's processing of your hearing request to the Office of Administrative Law; and
I. This form, completed, signed and dated with all of the information listed above, including attachments, to:

1. Office of Legal Affairs
   ATTENTION: Adjudicatory Hearing Requests
   Department of Environmental Protection
   401 East State Street
   PO Box 402, Trenton, New Jersey 08625-0402
2. Lawrence Baier, Chief
   Office of Dredging and Sediment Technology
   401 East State Street
   PO Box 028, Trenton, New Jersey 08625-0029
3. Any other person named on the permit (if you are a permittee under that permit).
4. The permittee(s) (if you are a person seeking consideration as a party to the action).

IV. Signature: _____ Date: _____

ACCEPTANCE OF
REVOCABLE CONSTRUCTION PERMIT/S

Mail To:

State of New Jersey
Department of Environmental Protection
Site Remediation Program
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625

Project Manager: Lawrence J. Baier_____

Section: Office of Dredging and Sediment Technology_____

Permit Number(s): _____

_____

_____

Date Issued: _____

The undersigned hereby accepts the above referenced revocable permit/s, subject to the terms and conditions included therein, including but not limited to the right of the State to revoke said permit/s with cause, and also subject to all provisions of law, rules, and regulations of any applicable government agency.

Signature: _____

Printed Name: _____

Title/Affiliation: _____

Attest: _____

(To be properly witnessed, signed and sealed)

CONSTRUCTION REPORT

Mail To:

State of New Jersey
Department of Environmental Protection
Site Remediation Program
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625

Project Manager: Lawrence J. Baier_____

Section: Office of Dredging and Sediment Technology_____

Permit Number(s): _____

_____

_____

Date Issued: _____

Applicant: _____

Name of Project: _____

Municipality/County: _____

Date Construction
Is to Begin: _____

I hereby give notice that construction will begin on the above noted project on the date stated above (must give at least 14 days notice). Also, as required by condition 7 of the permit, a copy of the above referenced permit/s along with all approved drawings shall be available for inspection at the project site throughout construction.

Engineer's Signature and Seal: _____

N.J. License Number: _____

Date: _____

COMPLETION REPORT

Mail To:

State of New Jersey
Department of Environmental Protection
Site Remediation Program
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625

Project Manager: Lawrence J. Baier_____

Section: Office of Dredging and Sediment Technology_____

Permit Number(s): _____

_____

_____

Date Issued: _____

Applicant: _____

Name of Project: _____

Municipality/County: _____

Date of Completion: _____

The undersigned hereby certifies that all activities approved by the Department within the above referenced permit/s have been constructed and completed in accordance with the plans approved therein, that said project is in compliance with all terms and conditions of the same, and that all unauthorized encroachments have been removed.

Engineer's Signature and Seal: _____

N.J. License Number: _____

Date: _____

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

(See Issuing Division below)

PERMIT*

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No. 0907-91-0006.12	Application No. 0907-91-0006.12

Issuance Date	Effective Date	Expiration Date
December 18, 1998	December 18, 1998	December 18, 2003

Name and Address of Applicant	Name and Address of Owner	Name and Address of Operator
BioGenesis, Inc. 7420 Alban Station Blvd., Suite B-208 Springfield, Va. 22150	Hudson County Improvement Auth. 2 Journal Square Plaza, 8th Floor Jersey City, New Jersey 07306	BioGenesis, Inc. 7420 Alban Station Blvd., Suite B-208 Springfield, Va. 22150

Location of Activity/Facility *(Street Address)*	Issuing Division	Statute(s)
Fish House Road Kearny Town, Hudson County Lot: 73 Block : 287	Office of Dredging and Sediment Technology	NJSA 58:16A-50 NJSA 58:10A NJSA 13:9B

Type of Permit Stream Encroachment	Maximum Approved Capacity, if applicable

This permit grants permission to:

Construct a pilot scale sediment washing facility within the 100 year tidal floodplain of the Hackensack River. The facility will include the construction of an asphalt or concrete pad approximately 90' X 180' in size, minor grading around the pad, and the installation of various storage tanks, pumps, pipes, treatment tanks and associated equipment. All of the equipment is to be housed within a temporary "sprung" structure. The approved work is shown on plans in three sheets titled: " Site Plan Former Koppers Seaboard Site Southern Area – Pilot Sediment Decontamination Project Kearny New Jersey," dated July 3, 1997, last revised November 10, 1998, and prepared by Weston; "BioGenesis Pilot Demonstration Project Equipment Arrangement – BioGenesis," dated July 14, 1998, last revised August 19, 1998, and prepared by Weston; and "Roy F. Weston 86.6' X 128' Remediation," dated November 2, 1998, unrevised and prepared by Sprung Instant Structures. This permit is subject continuous compliance with all of the conditions contained herein.

Prepared By: Lawrence J. Baier
Lawrence J. Baier

(See page 4 for Chief's signature.)

Revised Date	Approved by the Department of Environmental Protection
	Name (Print or Type) _____ Title _____
	Signature _____ Date _____

**The word permit means "approval, certification, registration, etc."*

(General Conditions are on Page Two)

This permit is subject to the following general conditions:

1. This permit is revocable, or subject to modification or change at any time, pursuant to the applicable regulations, when in the judgement of the Department of Environmental Protection of the State of New Jersey such revocation, modification or change shall be necessary.

2. The issuance of the permit shall not be deemed to affect in any way action by the Department of Environmental Protection of the State of New Jersey on any future application.

3. The works, facilities, and/or activities shown by plans and/or other engineering data, which are this day approved, subject to the conditions herewith established, shall be constructed and/or executed in conformity with such plans and/or engineering data and the said conditions.

4. No change in plans or specifications shall be made except with the prior written permission of the Department of Environmental Protection of the State of New Jersey.

5. The granting of this permit shall not be construed to in any was affect the title or ownership of property, and shall not make the Department of Environmental Protection or the State a party in any suit or question of ownership.

6. This permit does not waive the obtaining of Federal or other State or local government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained.

7. A copy of this permit shall be kept at the work site, and shall be exhibited upon request of any person.

8. In cases of conflict, the conditions of this permit shall supersede the plans and/or engineering data.

STREAM ENCROACHMENT PERMIT NO. 0907-91-0006.1

IN ADDITION TO THE GENERAL CONDITIONS PRINTED ON PAGE TWO OF THIS PERMIT, THE FOLLOWING CONDITIONS SHALL ALSO APPLY:

9. Limit and Extent of Approval

   a. This approval grants permission to the applicant and/or its agents to undertake an activity regulated by the State of New Jersey as described by the text of this permit and as detailed by the herein approved plans. Any construction, grading, removal of vegetation, or other activity at this site within or affecting a regulated flood plain, other than specifically approved by this permit or as detailed by the approved drawings, shall require additional approvals from the Department. The commencement of such regulated activities without the appropriate approvals shall be in violation of State law.

   b. All activities authorized by this permit shall be completed within five years of the issuance date as listed on the first page of this document. At that time, this approval, if not previously revoked, shall automatically become null and void, and none of the activities referenced herein may commence or continue until a new approval has been granted by the Department.

10. Method of Construction

   a. All activities approved by this permit shall be performed under the supervision and direction of a Professional Engineer licensed in the State of New Jersey, and shall be undertaken using the best management practices available. Furthermore, the site shall be subject to inspection at any time by representatives of the Department to ensure the continuous application of the provisions of this permit.

   b. During the course of construction, neither the applicant nor its agents shall cause or permit any unreasonable interference with the free flow of the stream by placing or dumping any materials, equipment, debris or structures within or adjacent to the stream corridor. Upon completion or abandonment of the work, the applicant and/or its agents shall remove and dispose of in a lawful manner all excess materials, equipment and debris from the stream corridor and adjacent lands.

   c. All activities authorized by this permit shall be stabilized in accordance with Standards for Soil Erosion and Sediment Control in New Jersey (obtainable from local Soil Conservation District Offices), or equal engineering specifications, to prevent eroded soil and sediment from entering adjacent waterways and wetlands at any time during and subsequent to construction. The Department reserves the right to order the suspension of any activity if unacceptable levels of erosion or turbidity result from the same. Furthermore, the applicant shall maintain the stream corridor as shown on the approved drawing/s for either such time as is required for the channel and/or banks to become reasonably stabilized, or for one year after completion of the project (as evidenced by a Certificate of Completion), whichever period of time is longer.

11. Responsibilities of Applicant

   a. The granting of this permit does not in any way relieve the applicant and/or its agents from the responsibility for damages caused by any construction or activities hereby approved, nor does the Department accept responsibility for any structural designs.

b. No construction authorized by this permit may begin until the enclosed permit acceptance form has been signed by the applicant and is returned to the Department. By signing and submitting this form, the applicant accepts this permit in its entirety and agrees to adhere to all of its terms and conditions. Please be advised that this permit may be declared null and void should it be determined that adequate measures had not been taken by the applicant and/or its agents to ensure the continuous implementation of these terms and conditions.

c. Within ten (10) days of the receipt of this permit by the applicant, this permit shall be recorded in its entirety in the office of the County Clerk or the Registrar of Deeds and Mortgages for each county where this permit is located. Verified notice of this action shall be forwarded to the Department immediately thereafter.

d. The enclosed construction notice shall be completed by the applicant or its agent and submitted to the Department at least fourteen (14) days prior to the commencement of the herein approved activities.

e. The enclosed completion report shall be completed by a Professional Engineer licensed in the State of New Jersey and submitted to the Department within thirty (30) days after completion of the herein approved activities.

12. **Consistency with Areawide Water Quality Management Plan**

This project has not been reviewed for consistency with the relevant Water Quality Management Plan or the Statewide Water Quality Management Planning Rules (N.J.A.C. 7:15). As such, there is no intended or implied approval regarding additional permits, which may be required from the Department. For treatment works approvals, the consistency determination will be performed by the Bureau of Engineering and Permitting (North/South) which may be reached at (609) 292-6894 for North (Middlesex, Hunterdon and Counties north) or (609) 633-1169 for South (Mercer, Monmouth and counties south). For general information concerning water quality management planning process, please contact the Office of Environmental Planning at (609) 633-1179.

13. The permittee may construct the facility authorized by this permit, but may NOT operate the facility until an approval has been received from the Passaic Valley Sewerage Commission agreeing to accept process waste water from this facility, and a copy of that authorization has been forwarded to the Office of Dredging and Sediment Technology, or an alternate wastewater treatment facility has been specifically approved by the Department to accept and/or discharge wastewater from this facility. This facility may NOT operate at anytime when a wastewater approval is lacking for this facility.

14. The permittee may not store any hazardous materials in the floodplain at any time.

Lawrence J. Baier — December 18, 1998

Lawrence J. Baier, Chief, — Date
Office of Dredging and Sediment Technology

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection

Robert C. Shinn, Jr.
Commissioner

Air Pollution Control Pre-Construction Permit

Permit Activity ID Number: PCP980001
Approval Date: January 21, 1999
Facility ID Number: 12071
Expiration Date: January 21, 2004

Mailing Address	Plant Location
CHARLES L. WILDE VICE PRESIDENT BIOGENESIS ENTERPRISES, INC. 7420 ALBAN STATION BLVD SPRINGFIELD, VA 22150	BIOGENESIS PILOT PLANT 1 FISH HOUSE RD Kearny Hudson County, New Jersey

Dear Mr. Wilde:

The New Jersey Department of Environmental Protection (Department) has reviewed the referenced air pollution control permit application. On the basis of the information available, the Department concludes that the application satisfies all applicable requirements of the New Jersey Air Pollution Control regulations codified at N.J.A.C. 7:27 et seq.. This Air Pollution Control Permit shall supercede any existing Air Pollution Control Permits issued for the specified source. This permit allows for inspection and evaluation of the equipment by the Department to assure conformance with all provisions of N.J.A.C. 7:27 et seq. and any other applicable federal requirements codified at 40 *CF 52, 60, 61* and *63*.

The equipment that is authorized to be installed and operated under this approval is described in Section A, Source Operations. Equipment at the facility referenced by this Permit shall be operated in accordance with the Conditions of Approval set forth in the attached document titled "Facility Specific Requirements" in Section D and with the "General Provisions" in Section B.

This Air Pollution Control Pre-Construction Permit and Certificate to Operate is being issued as a 90-day temporary operating certificate.

The Department will not issue a 5-year Certificate to Operate until and unless the applicant demonstrates compliance with the Conditions of Approval set forth in Section D of the attachments. This Air Pollution Control Pre-Construction Permit and Certificate to Operate may be revoked pursuant to N.J.A.C. 7:27-8.16 should any of the provisions of that regulation become applicable. Pursuant to N.J.A.C. 7:27-8.7(e), if the source is to continue to operate, the permittee must submit an application for renewal of the operating certificate ninety (90) days prior to its expiration.

There are a total of 57pages in this permit including this cover page.

If, in your judgement as an applicant for an air pollution control permit, the Department is imposing any unreasonable Condition of Approval, you may contest the Department's decision and request a contested case hearing pursuant to the Administrative Code at N.J.A.C. 1:1 and 7:27-8.12. All requests for contested case hearings must be received in writing by the Department within twenty (20) calendar days of the date you receive this permit approval and must contain the information specified in Section F (Permit Action Appeal Form).

If you have any questions on this matter, please call Joel Leon of the Bureau of Air Quality Engineering at (609) 984-3023.

Approved by:

Joel Leon for.

Iclal Atay, Ph. D., Chief
Bureau of Air Quality Engineering

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Section A

Facility Name: BIOGENESIS PILOT PLANT
Facility ID No.: 12071
Activity ID No.: PCP980001

SOURCE OPERATIONS

This Preconstruction Permit and the Temporary Certificate to Operate for the following equipment is issued pursuant to N.J.A.C. 7:27-8.

Description of Source Activity

Source Operation Type: A pilot plant which is design to treat dredge materials. The plant is authorized to operate 2160 hours as a means of determining the effectiveness of the treatment process

Source Operation Description: The maximum amount of dredge materials that may be processed is 600 cubic yards. The dredge material will be treated by a washing, aeration, and separation process. Carbon adsorption control devices are installed on the collision chamber and the aerator.

Source Operation Details: The sources authorized by this permit shall be operated within the parameters specified in the detailed information attached to this section. Operation of the authorized sources within these parameters is required in addition to compliance with the conditions specified in Section D – Facility Specific Requirements of this permit.

Section B

Facility: BIOGENESIS PILOT PLANT
Facility ID No.: 12071
Activity ID No.: PCP980001

GENERAL PROVISIONS AND AUTHORITIES
Preconstruction Permits

1. Not withstanding compliance with other provisions of N.J.A.C. 7:27-1 et seq., no person shall cause, suffer, allow or permit to be emitted into the outdoor atmosphere substances in quantities which shall result in air pollution as defined at N.J.A.C. 7:27-5.1. [N.J.A.C. 7:27-5.2(a)]

2. The permittee shall not construct, reconstruct, install, or modify a significant source without first obtaining a preconstruction permit under N.J.A.C. 7:27-8. This condition does not apply when conducting only normal repair or maintenance of control apparatus or equipment, as defined at N.J.A.C. 7:27-8.1 and N.J.A.C. 7:27-8.3(i). [N.J.A.C. 7:27-8.3(a)]

3. The permittee shall not operate (nor cause to be operated) a significant source without a valid operating certificate. This condition does not apply when conducting only normal repair or maintenance of control apparatus or equipment, as defined at N.J.A.C. 7:27-8.1 and N.J.A.C. 7:27-8.3(i). [N.J.A.C. 7:27-8.3(b)]

4. Permit Revisions:

   The permittee shall not take any action which requires a permit revision, compliance plan change, seven-day-notice change, amendment, or change to a batch plant permit, under any applicable provision at N.J.A.C. 7:27-8.17 through 8.23, without complying with that applicable provision. This condition does not apply when conducting only normal repair or maintenance of control apparatus or equipment, as defined at N.J.A.C. 7:27-8.1 and N.J.A.C. 7:27-8.3(i). [N.J.A.C. 7:27-8.3(c)]

   The following summarize N.J.A.C. 7:27-8.18 through 8.21:

   a. The permittee shall file a permit revision request and receive approval from the Department prior to increasing any maximum allowable emission limit, increasing actual emissions, causing the emissions of a new air contaminant, use a new raw material, reconstructing equipment, change the ground level concentration of an air contaminant in an area where the public has access, replace the permitted source, or constructing or installing a new significant source. [N.J.A.C. 7:27-8.18]

   b. The permittee shall file a compliance plan change request and receive approval from the Department prior to decreasing the frequency of testing, monitoring, recordkeeping, or reporting, changing the monitoring method, changing a level, rate, or limit of an operational parameter included in the conditions, or reducing a source's potential to emit. [N.J.A.C. 7:27-8.19]

   c. At least seven days prior to proceeding with a physical or operational change that is outside the scope of activities allowed by this permit, but will not increase emissions over the allowable emissions and will not alter the stack characteristics, the permittee shall file a seven-day-notice change. The permittee may proceed with the proposed changes seven days after such notice is filed with the Department. [N.J.A.C. 7:27-8.20]

d. The permittee shall file an amendment within 120 days of making any change of the information contained within Section C of this permit (Facility Profile), changing the name, number or designation of any equipment or stack covered by this permit, changing the parameters of a stack in such a way to reduce the ground level concentration of an air contaminant, or correction of a typographical error that will not result in an increase of actual or allowable emissions. [N.J.A.C. 7:27-8.21]

The permittee shall review the provisions of N.J.A.C. 7:27-8.18 through 7:27-8.21 to determine the appropriate type of request to file.

5. The permittee shall make this permit, together with any amendments, seven-day-notices, or other documents related to this permit, readily available for inspection on the operating premises. [N.J.A.C. 7:27-8.3(d)]

6. The permittee shall not use or cause to be used the equipment or control apparatus specified in this permit unless all components connected or attached to, or serving, the equipment or control apparatus, are functioning properly and are in compliance with all provisions of this permit. [N.J.A.C. 7:27-8.3(e)]

7. This permit is not transferable either from the location authorized in this permit to another location, or from any one piece of control apparatus or equipment to another piece of control apparatus or equipment. [N.J.A.C. 7:27-8.3(f)]

8. The permittee is fully responsible for compliance with N.J.A.C. 8:27-8 and with this permit and certificate, including adequate design, construction, and operation of the source, even if employees, contractors, or others work on or operate the permitted source. If the Department issues any other requirement with the force of law, such as an order, which applies to the source, the permittee is also responsible for compliance with that requirement. [N.J.A.C. 7:27-8.3(g)]

9. This permit does not relieve the permittee from the obligation to obtain all necessary permits from other government agencies and to comply with all other applicable Federal, State, and local rules and regulations. [N.J.A.C. 7:27-8.3(h)]

10. The permittee shall not suffer, allow, or permit any air contaminant detectable by the sense of smell to, to be present in the outdoor atmosphere in such quantity and duration which is, or tends to be, injurious to human health or welfare, animal or plant life or property, or would unreasonably interfere with the enjoyment of life or property. This shall not include an air contaminant which occurs only in areas over which the permittee has exclusive use or occupancy. In determining whether an odor unreasonably interferes with the enjoyment of life or property, the Department shall consider al of the relevant facts and circumstances, including, but not limited to, the character, severity, frequency, and duration of the odor, and the number of persons affected thereby. In considering these and other relevant facts and circumstances, no one factor shall be dispositive, but each shall be considered relevant in determining whether an odor interferes with the enjoyment of life or property, and, if so, whether such interference is unreasonable considering all of the circumstances. [N.J.A.C.7:27-8.3(j)]

11. The Department and its representatives have the right to enter and inspect any facility or property in accordance with N.J.A.C. 7:27-1.31. [N.J.A.C. 7:27-8.3(m)]

12. There shall be an affirmative defense to liability to penalties for a violation of this permit occurring as a result of an equipment malfunction, an equipment start-up, an equipment shutdown, or during the performance of necessary maintenance. The affirmative defense shall be asserted and established as required pursuant to P.L. 1993. c.89 (adding N.J.S.A. 26:2C-19.1 through 2C-19.5) and any rules the Department promulgates thereunder, and shall meet all of the requirements thereof. There shall also be an affirmative defense to liabilities for penalties or other sanctions for noncompliance with any technology based emission limitation in this permit, if the noncompliance was due to an emergency as defined at N.J.A.C. 7:27-22.1, provided that the

affirmative defense is asserted and established in compliance with 40 CFR 70.6(g) and meets all requirements thereof. [N.J.A.C. 7:27-8.3(n)]

13. No air contaminant, or category of air contaminant where accepted by the Department, shall be emitted other than those approved in the preconstruction permit. [N.J.A.C. 7:27-8.13(a)]

14. Any person to whom the Department has issued a preconstruction permit or certificate shall comply with all terms and conditions of any order related to the preconstruction permit or certificate. [N.J.A.C. 7:27-8.13(a)]

15. The permittee shall not cause or use the equipment specified in this permit in a manner that will result in the emission of any air contaminant not listed in the Conditions of Approval at a rate equal to or higher than the applicable reporting threshold set forth at N.J.A.C. 7:27-8 Appendix I, Table A or B. [N.J.A.C. 7:27-8.13(a)]

16. The permittee shall maintain all records required in the Conditions of Approval for a period of five (5) calendar years from the calendar year within which the record was generated. [N.J.A.C. 7:27-8.13(a)]

17. The Department may change the conditions of approval of any approved certificate to operate at the time of renewal of a temporary operating certificate; at the time of approval or renewal of a five-year operating certificate; or at any time during the period a certificate is in effect, if the Department determines that such change is necessary to protect human health or welfare or the environment. [N.J.A.C. 7:27-8.13(b)]

18. Upon request of the Department, the permittee shall submit to the Department information relevant to the operation of equipment and control apparatus including all information specified at N.J.A.C. 7:27-8.13(c). [N.J.A.C. 7:27-8.13(c)]

19. If the conditions of this permit or the certificate to operate require the Department to incur any of the following charges, the permittee shall reimburse the Department for the full amount of these charges: (1) The charges billed by any phone company for the maintenance of a dedicated telephone line required by this permit or the certificate to operate for the electronic transmission of data; or (2) The charges billed by any laboratory for performing the analysis of audit samples collected pursuant to testing or monitoring required by this permit or the certificate to operate. [N.J.A.C. 7:27-8.13(g)]

20. The permittee shall, when requested by the Department, provide such testing facilities exclusive of instrumentation and sensing devices as may be necessary for the Department to determine the kind and amount of air contaminants emitted from the equipment or control apparatus. The testing facilities shall include the utilities, the structure to hold testing equipment and/or personnel, and any ports in stacks needed to carry out testing required by this permit. During testing by the Department, the equipment and control apparatus shall be operated under such conditions within their capacities as may be requested by the Department. The test facilities may be either permanent or temporary, at the discretion of the person responsible for their provision, and shall conform to all applicable laws, regulations, and rules concerning safe construction and safe practice. Testing facilities which contain platforms and other means of personnel access shall conform to OSHA standards. [N.J.A.C. 7:27-8.13(i)]

21. Upon request of the Department, the permittee shall submit to the Department any record relevant to any permit or certificate. Such records shall be submitted to the Department within thirty (30) days of the request by the Department or within a longer time period if approved in writing by the Department. [N.J.A.C. 7:27-8.15(a)]

22. The permittee shall submit any required report in a format and on a schedule approved by the Department. Such report shall be transmitted on paper, on computer disk, or electronically, at the discretion of the Department. Any report submitted to the Department, including but not limited to a report submitted as an amendment of the permit pursuant to N.J.A.C. 7:27-8.3(c), shall include as an integral part of the report, certifications complying with N.J.A.C. 7:27-1.39. [N.J.A.C. 7:27-8.15(b)]

23. Any report submitted to the Department , including but not limited to, a report submitted as an amendment of this permit or the certificate to operate pursuant to N.J.A.C. 7:27-8.3(c) shall include, as an integral part of the report, certifications complying with N.J.A.C. 7:27-1.39. [N.J.A.C. 7:27-8.15(c)]

24. Upon request of the Department, the permittee shall report on forms obtained from the Department the air contaminant actual emissions, and information relevant thereto, of any air contaminant or category of air contaminant emitted by the equipment, control apparatus, or source operation. [N.J.A.C. 7:27-8.15(d)]

25. All numeric limits of any condition of this permit shall be interpreted to be followed by an inherent trailing zero (0) in the decimal portion of the limit (e.g. a printed limit of " 1 lb/hr" means a limit of " 1.0 lb/hr"; it does not mean a limit of " 1.5 lb/hr").

26. This listing of requirements reflects the state rules and regulations that apply to a majority of sources. The Department's failing to include in this section of the permit a specific requirement in a rule or regulation that applies to a permittee does not relieve that permittee from the obligation to comply with that regulation.

27. The following Department offices may be referenced in the permit. Please use the following addresses when submitting any correspondence to these offices:

Bureau of Technical Services
P. O. Box 437
380 Scotch Road
West Trenton, NJ 08625

Central Regional Enforcement Office
P. O. Box 407
Trenton, NJ 08625-0407

Metro Regional Enforcement Office
2 Babcock Place
West Orange, NJ 07052

Northern Regional Enforcement Office
1259 Route 46
Parsippany, NJ 07054

Southern Regional Enforcement Office
1 Port Center – Suite 201
2 Riverside Drive
Camden, NJ 08102

Section C

Facility Name: BIOGENESIS PILOT PLANT
Facility ID No.: 12071
Activity ID No.: PCP980001

FACILITY PROFILE

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Facility Profile (General)

Facility Name (AIMS): BioGenesis Pilot Plant

Facility ID (AIMS): 12071

Street Address: Fish House Road
Kearny, NJ 07032

State Plane Coordinates:

X-Coordinate:

Y-Coordinate:

Units:

Datum:

Source Org.:

Source Type:

Mailing Address: 7420 Alban Station Boulevard
Suite B-208
Springfield, VA 22150

County: Hudson

Location Description:

Industry:

Primary SIC: 4959

Secondary SIC:

New Jersey Department of Environmental Protection
Facility Profile (General)

Contact Type: **BNSR - New Source Review**

Organization: Roy F. Weston, Inc.
Org. Type: Private
Name: John G. Sontag, Jr.
NJ EIN: 00479788009
Title: Project Manager
Phone: (610) 701-3737 x
Fax: (610) 701-7597 x
Other: ( ) - x
Type:
Email:

Mailing Address: 1400 Weston Way
P.O. Box 2653
Building 4-2
West Chester, PA 19380

Contact Type: **Consultant**

Organization: Roy F. Weston, Inc.
Org. Type: Private
Name: John G. Sontag, Jr.
NJ EIN: 00479788009
Title: Project Manager
Phone: (610) 701-3737 x
Fax: (610) 701-7597 x
Other: ( ) - x
Type:
Email:

Mailing Address: 1400 Weston Way
P.O. Box 2653
Building 4-2
West Chester, PA 19380

Contact Type: **General Contact**

Organization: BioGenesis Enterprises, Inc.
Org. Type: Private
Name: Charles L. Wilde
NJ EIN:
Title: Vice President
Phone: (703) 913-9700 x
Fax: (703) 913-9704 x
Other: ( ) - x
Type:
Email:

Mailing Address: 7420 Alban Station Boulevard
Suite B-208
Springfield, VA 22150

New Jersey Department of Environmental Protection
Facility Profile (General)

Contact Type: Responsible Party

Organization: BioGenesis Enterprises, Inc.

Org. Type: Private

Name: Charles L. Wilde

NJ EIN:

Title: Vice President

Phone: (703) 913-9700 x

Fax: (703) 913-9704 x

Other: ( ) - x

Type:

Email:

Mailing Address: 7420 Alban Station Boulevard
Suite B-208
Springfield, VA 22150

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Facility Profile (Permitting)

1. Is this facility classified as a small business by the USEPA?	No
2. Is this facility subject to N.J.A.C. 7:27-22?	No
3. Are you voluntarily subjecting this facility to the requirements of Subchapter 22?	No
4. Has a copy of this application been sent to the USEPA?	No
5. If not, has the EPA waived the requirement?	No
6. Are you claiming any portion of this application to be confidential?	No
7. Have you provided, or are you planning to provide air contaminant modeling?	No

Section D

Facility Name: BIOGENESIS PILOT PLANT
Facility ID No.: 12071
Activity ID No.: PCP980001

FACILITY SPECIFIC REQUIREMENTS

Facility Specific Requirements Glossary

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BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: **CD1 V-102(prim)**

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	The permittee shall attach to this permit, a list of all air contaminants being controlled by the carbon adsorption unit for which the specified concentration levels apply.[N.J.A.C. 7:27-8.3(b)].			
2	The permittee shall install and operate on Aerator E2 V-102 a minimum of two carbon adsorption units (primary-CD1 V-102(prim) & secondary-CD2 V-102(secon)) in series. Once the primary unit has reached breakthrough, it shall be taken off-line and replaced with the secondary unit. The spent primary unit shall be replaced with a fresh (virgin or regenerated) carbon unit. [N.J.A.C. 7:27-8.3(b)].			
3	The carbon adsorption unit(s) shall be replaced when the breakthrough concentration is exceeded. The breakthrough concentration shall be 20 parts per million by volume as equivalent methane between the carbon units. At breakthrough, CD1 shall be taken off-line, CD2 shall replace CD1, and a fresh or regenerated carbon unit shall replace CD2. Concentration of Air Contaminants at Outlet of Primary Absorption Unit(s) <= 20 ppm. [N.J.A.C. 7:27-8.3(b)].	Concentration of Air Contaminants at Outlet of Primary Absorption Unit(s): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. The frequency of monitoring shall be as agreed upon between permittee and Department.[N.J.A.C. 7:27-8.13(d)1].	Concentration of Air Contaminants at Outlet of Primary Absorption Unit(s): Recordkeeping by manual logging of parameter upon occurrence of event The frequency for recording concentration readings shall be equivalent to the monitoring frequency. The permittee shall record the time and date of each replacement of carbon adsorption unit(s). [N.J.A.C. 7:27-8.13(d)3].	No submittal or action required: Not Applicable [N.J.A.C. 7:27-8.13(d)4].

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: CD1 V-102(prim)

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
4	Saturated or partially used adsorption material shall be disposed of in a manner that minimizes releases of air contaminants to the atmosphere. This shall be done in accordance with all applicable State and Federal solid waste management regulations.[N.J.A.C. 7:27-8.3(b)].			
5	Weight of Carbon and Contaiminants Upon Replacement of Carbon: The weight of the virgin or regenerated carbon prior to use shall be at least 42 pounds. [N.J.A.C. 7:27-8.13(a)].	Weight of Carbon and Contaiminants Upon Replacement of Carbon: Monitored by documentation of construction upon occurrence of event, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].		

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: CD2 V-102(secon)

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Weight of Carbon and Contaiminants Upon Replacement of Carbon: The weight of the virgin or regenerated carbon prior to use shall be at least 42 pounds in the cannister. [N.J.A.C. 7:27-8.13(a)].	Weight of Carbon and Contaiminants Upon Replacement of Carbon: Monitored by documentation of construction upon occurrence of event, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].		
2	Saturated or partially used adsorption material shall be disposed of in a manner that minimizes releases of air contaminants to the atmosphere. This shall be done in accordance with all applicable State and Federal solid waste management regulations.[N.J.A.C. 7:27-8.3(b)].			
3	VOC (Total): The VOC outlet concentration shall be sampled. [N.J.A.C. 7:27-8.13(d)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(d)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(d)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: CD3 V-103

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Weight of Carbon and Contaiminants Upon Replacement of Carbon: The weight of the virgin or regenerated carbon prior to use shall be at least 200 pounds. [N.J.A.C. 7:27-8.13(a)].	Weight of Carbon and Contaiminants Upon Replacement of Carbon: Monitored by documentation of construction upon occurrence of event, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].		
2	Saturated or partially used adsorption material shall be disposed of in a manner that minimizes releases of air contaminants to the atmosphere. This shall be done in accordance with all applicable State and Federal solid waste management regulations.[N.J.A.C. 7:27-8.3(b)].			
3	VOC (Total): The VOC outlet concentration shall be sampled. [N.J.A.C. 7:27-8.13(d)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(d)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(d)].	
4	The permittee shall install and operate a single carbon adsorption unit on collision chamber E3 V-103. Once breakthrough is reached, the carbon adsorption unit shall be replaced by a fresh (virgin or regenerated) carbon adsorption unit. The carbon unit shall be replaced if the VOC concentration level exceed 25 parts per million by volume, as equivalent methane. [N.J.A.C. 7:27-8.3(b)].	Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination It shall be monitored when breakthrough occurs. [N.J.A.C. 7:27-8.13(a)].	Recordkeeping by manual logging of parameter upon occurrence of event the event being carbon breakthrough [N.J.A.C. 7:27-8.13(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E1 V-101

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Hours of Operation <= 2,160 hours. [N.J.A.C. 7:27-8.13(a)].	Every day, the hours the tank was used for storage shall be monitored based on usage. Hours of Operation: Monitored by other method (provide description) daily, based on no averaging period. [N.J.A.C. 7:27-8.13(a)].	Hours of Operation: Recordkeeping by manual logging of parameter daily. [N.J.A.C. 7:27-8.13(d)].	
2	VOC (Total): the stack shall be tested periodically. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. [N.J.A.C. 7:27-8.d(1)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(d)3].	
3	The equipment shall consist of one mix tank with a capacity of 6,900 gallons. The mix tank shall combine the dredge materials with water, surfactants, and chelating agents. [N.J.A.C. 7:27-8.13(h)].	Monitored by documentation of construction upon request of the Department, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(d)].	Recordkeeping by Not Applicable Not Applicable. [N.J.A.C. 7:27-8.13(d)3].	
4	No more than 600 cubic yards of dredge materials shall be charged to the mix tank over the 2160 hours of processing time. Total Production Rate <= 600 (other units). [N.J.A.C. 7:27-8.13(a)].	Total Production Rate: Monitored by material feed/flow monitoring each hour during operation, based on a 1 hour block average by monitoring the volume of each batch. [N.J.A.C. 7:27-8.13(d)].	Total Production Rate: Recordkeeping by manual logging of parameter each hour during operation by recording the volume of each batch. [N.J.A.C. 7:27-8.13(d)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E2 V-102

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Hours of Operation <= 720 hours. [N.J.A.C. 7:27-8.13(a)].	Every day, the hours the tank was used for storage shall be recorded. Hours of Operation: Monitored by other method (provide description) daily, based on no averaging period. [N.J.A.C. 7:27-8.13(a)].	Hours of Operation: Recordkeeping by manual logging of parameter daily. [N.J.A.C. 7:27-8.13(d)].	
2	VOC (Total): the stack shall be tested periodically. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. [N.J.A.C. 7:27-8.d(1)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(d)3].	
3	VOC (Total): At least one sample shall be taken with a Summa cannister. [N.J.A.C. 7:27-8.13(d)].	VOC (Total): Monitored by stack emission testing once initially, based on an instantaneous determination This testing shall be done with a Summa cannister. [N.J.A.C. 7:27-8.13(d)1].	VOC (Total): Recordkeeping by certified lab analysis results upon occurrence of event. [N.J.A.C. 7:27-8.13(d)3].	
4	No more than 600 cubic yards of dredge materials shall be charged to the aerator over the 720 hours of processing time. Total Production Rate <= 600 (other units). [N.J.A.C. 7:27-8.13(a)].	Total Production Rate: Monitored by material feed/flow monitoring each hour during operation, based on a 1 hour block average by monitoring each batch [N.J.A.C. 7:27-8.13(d)].	Total Production Rate: Recordkeeping by manual logging of parameter each hour during operation. [N.J.A.C. 7:27-8.13(d)].	
5	The equipment shall consist of one aerator with a capacity of 3,800 gallons. The aerator shall charge air to the dredged material at a rate of approximately 1150 cubic feet per minute. [N.J.A.C. 7:27-8.13(h)].	Monitored by documentation of construction upon request of the Department, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(d)].	Recordkeeping by Not Applicable Not Applicable. [N.J.A.C. 7:27-8.13(d)3].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E3 V-103

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Hours of Operation <= 720 hours. [N.J.A.C. 7:27-8.13(a)].	Every day, the hours the tank was used for storage shall be recorded. Hours of Operation: Monitored by other method (provide description) daily, based on no averaging period. [N.J.A.C. 7:27-8.13(a)].	Hours of Operation: Recordkeeping by manual logging of parameter daily. [N.J.A.C. 7:27-8.13(d)].	
2	VOC (Total): the stack shall be tested periodically. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. [N.J.A.C. 7:27-8.d(1)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(d)3].	
3	VOC (Total): At least one sample shall be taken with a Summa cannister. [N.J.A.C. 7:27-8.13(d)].	VOC (Total): Monitored by stack emission testing once initially, based on an instantaneous determination This testing shall be done with a Summa cannister. [N.J.A.C. 7:27-8.13(d)1].	VOC (Total): Recordkeeping by certified lab analysis results upon occurrence of event. [N.J.A.C. 7:27-8.13(d)3].	
4	No more than 600 cubic yards of dredge materials shall be charged to the aerator over the 720 hours of processing time. Total Production Rate <= 600 (other units). [N.J.A.C. 7:27-8.13(a)].	Total Production Rate: Monitored by material feed/flow monitoring each hour during operation, based on a 1 hour block average by monitoring each batch. [N.J.A.C. 7:27-8.13(d)].	Total Production Rate: Recordkeeping by manual logging of parameter each hour during operation. [N.J.A.C. 7:27-8.13(d)].	
5	The equipment shall consist of one collision chamber with a capacity of 300 gallons. [N.J.A.C. 7:27-8.13(h)].	Monitored by documentation of construction upon request of the Department, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(d)].	Recordkeeping by Not Applicable Not Applicable. [N.J.A.C. 7:27-8.13(d)3].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E4 T-101

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Maximum No. of Billable Compliance Inspections <= 1 inspections. The equipment covered by this permit will be subject to inspection fees for the maximum periodic compliance inspections (as defined in N.J.A.C. 7:27-8.1) over the life of the Certificate, after it receives final approval for a five year duration. The applicant will be invoiced for a $200 service fee per inspection pursuant to N.J.A.C. 7:27-8.11 after the periodic compliance inspection is conducted.[N.J.A.C. 7:27-8.13(c)].			
2	VOC (Total) <= 0.054 tons/yr. [N.J.A.C. 7:27-8.13(h)].	VOC (Total): Monitored by material balance annually, based on a 12 calendar month average. A mass balance and engineering judgement shall be used to determine the emissions. [N.J.A.C. 7:27-8.13(d)2].	VOC (Total): Recordkeeping by manual logging of parameter annually: once per calendar year . Records of all calculations shall be maintained. [N.J.A.C. 7:27-8.13(d)3].	
3	The permittee shall record the annual combined total throughput of all dredge material in cubic yards. The equipment shall consist of nine twenty thousand gallon storage tanks, for a total capacity of 180,000 gallons. The tanks shall store only dredged materials which have not been dewatered. [N.J.A.C. 7:27-8.13(h)].	Monitored by waste feed/charge rate monitoring (liquid) once per calendar day during operation, based on one calendar day. [N.J.A.C. 7:27-8.13(a)].	Recordkeeping by manual logging of parameter annually: once per calendar year . The permittee shall record the annual combined total throughput of all material stored or blended in the tank. [N.J.A.C. 7:27-8.13(d)3].	
4	The tank shall be equipped with a conservation vent.[N.J.A.C. 7:27-16.2(b)].	Monitored by documentation of construction upon request of the Department, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].		

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E4 T-101

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
5	VOC (Total): the stack shall be tested periodically at Stack PT-3.. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. [N.J.A.C. 7:27-8.d(1)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(d)3].	
6	Hydrogen sulfide: shall be monitored within seven days of startup at Stack PT-3.. [N.J.A.C. 7:27-8.13(d)1].	Hydrogen sulfide: Monitored by periodic emission monitoring (portable instrument) at the approved frequency, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(d)1].	Hydrogen sulfide: Recordkeeping by manual logging of parameter upon occurrence of event. [N.J.A.C. 7:27-8.13(d)3].	
7	Hours of Operation <= 2,160 hours. [N.J.A.C. 7:27-8.13(a)].	Every day, the hours the tank was used for storage shall be recorded. Hours of Operation: Monitored by other method (provide description) daily, based on no averaging period. [N.J.A.C. 7:27-8.13(a)].	Hours of Operation: Recordkeeping by manual logging of parameter daily. [N.J.A.C. 7:27-8.13(d)].	
8	VOC (Total): The total VOC content in the dredge solids processed shall be monitored and recorded. [N.J.A.C. 7:27-8.13(a)].	The total amount of VOC charged to the storage tank shall be calculated as follows: (amount of solids processed, in pounds)*(VOC concentration, ppmw)*(1/1,000,000) VOC (Total): Monitored by calculations at the approved frequency, based on the averaging period as per Department approved test method. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Recordkeeping by manual logging of parameter upon occurrence of event. [N.J.A.C. 7:27-8.13(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E10 No. 1 Pump

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Maximum No. of Billable Compliance Inspections <= 2 inspections. The equipment covered by this permit will be subject to inspection fees for the maximum periodic compliance inspections (as defined in N.J.A.C. 7:27-8.1) over the life of the Certificate, after it receives final approval for a five year duration. The applicant will be invoiced for a $200 service fee per inspection pursuant to N.J.A.C. 7:27-8.11 after the periodic compliance inspection is conducted.[N.J.A.C. 7:27-8.13(e)].			
2	Opacity <= 20 % exclusive of visible condensed water vapor, for a period greater than 10 seconds. [N.J.A.C. 7:27-3.5].		Opacity: Recordkeeping by manual logging of parameter annually. All records created in a calendar year shall be maintained on site or at the Weston Offices in West Chester, Pennsylvania for five additional calendar years, and made available to the Department for review, upon request.[N.J.A.C. 7:27-3.6].	
3	Total Hours of Operation <= 720 hr/yr. [N.J.A.C. 7:27-8.13(h)].	Total Hours of Operation: Monitored by hour/time monitor daily, based on a 12 calendar month average. [N.J.A.C. 7:27-8.13(d)2].	Total Hours of Operation: Recordkeeping by manual logging of parameter annually: once per calendar year. [N.J.A.C. 7:27-8.13(d)3].	
4	Maximum Gross Heat Input <= 1.734 MMBTU/hr. [N.J.A.C. 7:27-8.13(h)].	Maximum Gross Heat Input: Monitored by documentation of construction upon request of the Department, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].		

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: **E10 No. 1 Pump**

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
5	Sulfur Content in Fuel <= 0.2 % by weight. [N.J.A.C. 7:27-8.13(d)].	Sulfur Content in Fuel: Monitored by other method (provide description) once per bulk fuel shipment, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].	Sulfur Content in Fuel: Recordkeeping by fuel certification receipts upon occurrence of event. [N.J.A.C. 7:27-8.13(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E11 No. 2 Pump

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Maximum No. of Billable Compliance Inspections <= 2 inspections. The equipment covered by this permit will be subject to inspection fees for the maximum periodic compliance inspections (as defined in N.J.A.C. 7:27-8.1) over the life of the Certificate, after it receives final approval for a five year duration. The applicant will be invoiced for a $200 service fee per inspection pursuant to N.J.A.C. 7:27-8.11 after the periodic compliance inspection is conducted.[N.J.A.C. 7:27-8.13(e)].			
2	Opacity <= 20 % exclusive of visible condensed water vapor, for a period greater than 10 seconds. [N.J.A.C. 7:27-3.5].		Opacity: Recordkeeping by manual logging of parameter annually: once per calendar year . All records created in a calendar year shall be maintained on site for five additional calendar years, and made available to the Department for review, upon request. [N.J.A.C. 7:27-3.6].	
3	Total Hours of Operation <= 720 hr/yr. [N.J.A.C. 7:27-8.13(h)].	Total Hours of Operation: Monitored by hour/time monitor daily, based on a 12 calendar month average. [N.J.A.C. 7:27-8.13(d)2].	Total Hours of Operation: Recordkeeping by manual logging of parameter annually: once per calendar year. [N.J.A.C. 7:27-8.13(d)3].	
4	Maximum Gross Heat Input <= 1.734 MMBTU/hr. [N.J.A.C. 7:27-8.13(h)].	Maximum Gross Heat Input: Monitored by documentation of construction upon request of the Department, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].		

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E11 No. 2 Pump

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
5	Sulfur Content in Fuel <= 0.2 % by weight. [N.J.A.C. 7:27-8.13(d)].	Sulfur Content in Fuel: Monitored by other method (provide description) once per bulk fuel shipment, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].	Sulfur Content in Fuel: Recordkeeping by fuel certification receipts upon occurrence of event. [N.J.A.C. 7:27-8.13(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E12 AE Generator

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Maximum No. of Billable Compliance Inspections <= 2 inspections. The equipment covered by this permit will be subject to inspection fees for the maximum periodic compliance inspections (as defined in N.J.A.C. 7:27-8.1) over the life of the Certificate, after it receives final approval for a five year duration. The applicant will be invoiced for a $200 service fee per inspection pursuant to N.J.A.C. 7:27-8.11 after the periodic compliance inspection is conducted.[N.J.A.C. 7:27-8.13(c)].			
2	Opacity <= 20 % exclusive of visible condensed water vapor, for a period greater than 10 seconds. [N.J.A.C. 7:27-3.5].		Opacity: Recordkeeping by manual logging of parameter annually: once per calendar year . All records created in a calendar year shall be maintained on site for five additional calendar years, and made available to the Department for review, upon request. [N.J.A.C. 7:27-3.6].	
3	Total Hours of Operation <= 720 hr/yr. [N.J.A.C. 7:27-8.13(h)].	Total Hours of Operation: Monitored by hour/time monitor daily, based on a 12 calendar month average. [N.J.A.C. 7:27-8.13(d)2].	Total Hours of Operation: Recordkeeping by manual logging of parameter annually: once per calendar year. [N.J.A.C. 7:27-8.13(d)3].	
4	Maximum Gross Heat Input <= 1.632 MMBTU/hr. [N.J.A.C. 7:27-8.13(h)].	Maximum Gross Heat Input: Monitored by documentation of construction upon request of the Department, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].		

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E12 AE Generator

Ref.#	Applicable Requirement	*Monitoring Requirement*	*Recordkeeping Requirement*	*Submittal/Action Requirement*
5	Sulfur Content in Fuel <= 0.2 % by weight. [N.J.A.C. 7:27-8.13(d)].	Sulfur Content in Fuel: Monitored by other method (provide description) once per bulk fuel shipment, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].	Sulfur Content in Fuel: Recordkeeping by fuel certification receipts upon occurrence of event. [N.J.A.C. 7:27-8.13(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E13 Main Generat

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Maximum No. of Billable Compliance Inspections <= 2 inspections. The equipment covered by this permit will be subject to inspection fees for the maximum periodic compliance inspections (as defined in N.J.A.C. 7:27-8.1) over the life of the Certificate, after it receives final approval for a five year duration. The applicant will be invoiced for a $200 service fee per inspection pursuant to N.J.A.C. 7:27-8.11 after the periodic compliance inspection is conducted.[N.J.A.C. 7:27-8.13(e)].			
2	Opacity <= 20 % exclusive of visible condensed water vapor, for a period greater than 10 seconds. [N.J.A.C. 7:27-3.5].		Opacity: Recordkeeping by manual logging of parameter annually: once per calendar year . All records created in a calendar year shall be maintained on site for five additional calendar years, and made available to the Department for review, upon request. [N.J.A.C. 7:27-3.6].	
3	Total Hours of Operation <= 720 hr/yr. [N.J.A.C. 7:27-8.13(h)].	Total Hours of Operation: Monitored by hour/time monitor daily, based on a 12 calendar month average. [N.J.A.C. 7:27-8.13(d)2].	Total Hours of Operation: Recordkeeping by manual logging of parameter annually: once per calendar year. [N.J.A.C. 7:27-8.13(d)3].	
4	Maximum Gross Heat Input <= 5.457 MMBTU/hr. [N.J.A.C. 7:27-8.13(h)].	Maximum Gross Heat Input: Monitored by documentation of construction upon request of the Department, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].		

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: E13 Main Generat

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
5	Sulfur Content in Fuel <= 0.2 % by weight. [N.J.A.C. 7:27-8.13(d)].	Sulfur Content in Fuel: Monitored by other method (provide description) once per bulk fuel shipment, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].	Sulfur Content in Fuel: Recordkeeping by fuel certification receipts upon occurrence of event. [N.J.A.C. 7:27-8.13(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: PT1 V-102

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	No changes to the approved stack shall be made without prior approval from the Department.[N.J.A.C. 7:27-8.3(a)].			
2	Distance from Stack to Nearest Property Line >= 110 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
3	Stack Height Above Ground >= 10 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
4	Inside Flue Diameter at Stack Exit >= 0 and Inside Flue Diameter at Stack Exit <= 4 inches. [N.J.A.C. 7:27-8.13(d)2.ii].			
5	Stack Gas Discharge Temperature >= 50 and Stack Gas Discharge Temperature <= 90 degrees F. [N.J.A.C. 7:27-8.13(d)2.ii].			
6	Volume of Gas Discharged at Stack Conditions >= 1,000 ACFM. [N.J.A.C. 7:27-8.13(d)2.ii].			
7	Emissions from the source shall be vented to the atmosphere upward through the approved stack.[N.J.A.C. 7:27-8.13(d)2.ii].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: PT2 V-103

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	No changes to the approved stack shall be made without prior approval from the Department.[N.J.A.C. 7:27-8.3(a)].			
2	Distance from Stack to Nearest Property Line >= 100 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
3	Stack Height Above Ground >= 10 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
4	Inside Flue Diameter at Stack Exit >= 0 and Inside Flue Diameter at Stack Exit <= 4 inches. [N.J.A.C. 7:27-8.13(d)2.ii].			
5	Stack Gas Discharge Temperature >= 50 and Stack Gas Discharge Temperature <= 90 degrees F. [N.J.A.C. 7:27-8.13(d)2.ii].			
6	Volume of Gas Discharged at Stack Conditions >= 20 ACFM. [N.J.A.C. 7:27-8.13(d)2.ii].			
7	Emissions from the source shall be vented to the atmosphere upward through the approved stack.[N.J.A.C. 7:27-8.13(d)2.ii].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: PT3 V-101

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	No changes to the approved stack shall be made without prior approval from the Department.[N.J.A.C. 7:27-8.3(a)].			
2	Distance from Stack to Nearest Property Line >= 115 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
3	Stack Height Above Ground >= 8 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
4	Inside Flue Diameter at Stack Exit >= 0 and Inside Flue Diameter at Stack Exit <= 4 inches. [N.J.A.C. 7:27-8.13(d)2.ii].			
5	Stack Gas Discharge Temperature >= 50 and Stack Gas Discharge Temperature <= 90 degrees F. [N.J.A.C. 7:27-8.13(d)2.ii].			
6	Volume of Gas Discharged at Stack Conditions >= 0 and Volume of Gas Discharged at Stack Conditions <= 10 ACFM. [N.J.A.C. 7:27-8.13(d)2.ii].			
7	Emissions from the source shall be vented to the atmosphere upward through the approved stack.[N.J.A.C. 7:27-8.13(d)2.ii].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: **PT10 PT10**

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	No changes to the approved stack shall be made without prior approval from the Department.[N.J.A.C. 7:27-8.3(a)].			
2	Distance from Stack to Nearest Property Line >= 100 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
3	Stack Height Above Ground >= 3 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
4	Inside Flue Diameter at Stack Exit >= 0 and Inside Flue Diameter at Stack Exit <= 2 inches. [N.J.A.C. 7:27-8.13(d)2.ii].			
5	Stack Gas Discharge Temperature >= 900 and Stack Gas Discharge Temperature <= 1,200 degrees F. [N.J.A.C. 7:27-8.13(d)2.ii].			
6	Volume of Gas Discharged at Stack Conditions >= 1,000 and Volume of Gas Discharged at Stack Conditions <= 1,350 ACFM. [N.J.A.C. 7:27-8.13(d)2.ii].			
7	Emissions from the source shall be vented to the atmosphere upward through the approved stack.[N.J.A.C. 7:27-8.13(d)2.ii].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: PT11 PT11

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	No changes to the approved stack shall be made without prior approval from the Department.[N.J.A.C. 7:27-8.3(a)].			
2	Distance from Stack to Nearest Property Line >= 100 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
3	Stack Height Above Ground >= 3 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
4	Inside Flue Diameter at Stack Exit >= 0 and Inside Flue Diameter at Stack Exit <= 2 inches. [N.J.A.C. 7:27-8.13(d)2.ii].			
5	Stack Gas Discharge Temperature >= 900 and Stack Gas Discharge Temperature <= 1,200 degrees F. [N.J.A.C. 7:27-8.13(d)2.ii].			
6	Volume of Gas Discharged at Stack Conditions >= 1,000 and Volume of Gas Discharged at Stack Conditions <= 1,350 ACFM. [N.J.A.C. 7:27-8.13(d)2.ii].			
7	Emissions from the source shall be vented to the atmosphere upward through the approved stack.[N.J.A.C. 7:27-8.13(d)2.ii].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: PT12 PT12

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	No changes to the approved stack shall be made without prior approval from the Department.[N.J.A.C. 7:27-8.3(a)].			
2	Distance from Stack to Nearest Property Line >= 100 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
3	Stack Height Above Ground >= 3 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
4	Inside Flue Diameter at Stack Exit >= 0 and Inside Flue Diameter at Stack Exit <= 2 inches. [N.J.A.C. 7:27-8.13(d)2.ii].			
5	Stack Gas Discharge Temperature >= 900 and Stack Gas Discharge Temperature <= 1,200 degrees F. [N.J.A.C. 7:27-8.13(d)2.ii].			
6	Volume of Gas Discharged at Stack Conditions >= 1,000 and Volume of Gas Discharged at Stack Conditions <= 1,350 ACFM. [N.J.A.C. 7:27-8.13(d)2.ii].			
7	Emissions from the source shall be vented to the atmosphere upward through the approved stack.[N.J.A.C. 7:27-8.13(d)2.ii].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: PT13 PT13

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	No changes to the approved stack shall be made without prior approval from the Department.[N.J.A.C. 7:27-8.3(a)].			
2	Distance from Stack to Nearest Property Line >= 150 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
3	Stack Height Above Ground >= 3 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
4	Inside Flue Diameter at Stack Exit >= 0 and Inside Flue Diameter at Stack Exit <= 2 inches. [N.J.A.C. 7:27-8.13(d)2.ii].			
5	Stack Gas Discharge Temperature >= 900 and Stack Gas Discharge Temperature <= 1,200 degrees F. [N.J.A.C. 7:27-8.13(d)2.ii].			
6	Volume of Gas Discharged at Stack Conditions >= 2,500 and Volume of Gas Discharged at Stack Conditions <= 4,000 ACFM. [N.J.A.C. 7:27-8.13(d)2.ii].			
7	Emissions from the source shall be vented to the atmosphere upward through the approved stack.[N.J.A.C. 7:27-8.13(d)2.ii].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: PT99 T-101

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	No changes to the approved stack shall be made without prior approval from the Department.[N.J.A.C. 7:27-8.3(a)].			
2	Distance from Stack to Nearest Property Line >= 160 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
3	Stack Height Above Ground >= 13 ft. [N.J.A.C. 7:27-8.13(d)2.ii].			
4	Inside Flue Diameter at Stack Exit >= 0 and Inside Flue Diameter at Stack Exit <= 4 inches. [N.J.A.C. 7:27-8.13(d)2.ii].			
5	Stack Gas Discharge Temperature >= 50 and Stack Gas Discharge Temperature <= 90 degrees F. [N.J.A.C. 7:27-8.13(d)2.ii].			
6	Volume of Gas Discharged at Stack Conditions >= 0 and Volume of Gas Discharged at Stack Conditions <= 10 ACFM. [N.J.A.C. 7:27-8.13(d)2.ii].			
7	Emissions from the source shall be vented to the atmosphere upward through the approved stack.[N.J.A.C. 7:27-8.13(d)2.ii].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: **U1 Pilot Plant**

Operating Scenario: ***OS4 T-101***

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	VOC (Total) <= 0.05 lb/hr. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. Emission rates shall be calculated using the VOC emission concentration in ppm determine during required stack monitoring, the stack gas flow rate determined at the point of monitoring, and the molecular weight of the monitor's calibration gas as follows: lb/hr = (Stack Concentration (ppm)) * (estimated flowrate (ft3/min)) * (Molecular weight of calibration gas) * (1.55 E-7). The calculated value shall be corrected to standard conditions. Monitoring shall occur at the frequency required for monitoring VOC concentration (ppm) limits[N.J.A.C. 7:27-8.13(a)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U1 Pilot Plant

Operating Scenario: OS3 V-103

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	VOC (Total) <= 3.5 lb/hr. [N.J.A.C. 7:27-16.16(c)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. Emission rates shall be calculated using the VOC emission concentration in ppm determine during required stack monitoring, the stack gas flow rate determined at the point of monitoring, and the molecular weight of the monitor's calibration gas as follows: lb/hr = (Stack Concentration (ppm)) * (estimated flowrate (ft3/min)) * (Molecular weight of calibration gas) * (1.55 E-7). The calculated value shall be corrected to standard conditions. Monitoring shall occur at the frequency required for monitoring VOC concentration (ppm) limits.[N.J.A.C. 7:27-8.13(d)1].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. Records of all calculations shall be maintained on-site for a minimum of five (5) years.[N.J.A.C. 7:27-16.22(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U1 Pilot Plant

Operating Scenario: OS3 V-103

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
2	VOC (Total) <= 0.05 lb/hr. [N.J.A.C. 7:27-8.13(a)].	Emission rates shall be calculated using the VOC emission concentration in ppm determine during required stack monitoring, the stack gas flow rate determined at the point of monitoring, and the molecular weight of the monitor's calibration gas as follows: lb/hr = (Stack Concentration (ppm)) * (estimated flowrate (ft3/min)) * (Molecular weight of calibration gas) * (1.55 E-7). The calculated value shall be corrected to standard conditions. Monitoring shall occur at the frequency required for monitoring VOC concentration (ppm) limits. VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(A)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U1 Pilot Plant

Operating Scenario: OS2 V-102

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	VOC (Total) <= 3.5 lb/hr. [N.J.A.C. 7:27-16.16(c)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. Emission rates shall be calculated using the VOC emission concentration in ppm determine during required stack monitoring, the stack gas flow rate determined at the point of monitoring, and the molecular weight of the monitor's calibration gas as follows: lb/hr = (Stack Concentration (ppm)) * (estimated flowrate (ft3/min)) * (Molecular weight of calibration gas) * (1.55 E-7). The calculated value shall be corrected to standard conditions. Monitoring shall occur at the frequency required for monitoring VOC concentration (ppm) limits.[N.J.A.C. 7:27-8.13(d)1].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. Records of all calculations shall be maintained on-site for a minimum of five (5) years.[N.J.A.C. 7:27-16.22(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U1 Pilot Plant

Operating Scenario: OS2 V-102

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
2	VOC (Total) <= 0.05 lb/hr. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination Emission rates shall be calculated using the VOC emission concentration in ppm determine during required stack monitoring, the stack gas flow rate determined at the point of monitoring, and the molecular weight of the monitor's calibration gas as follows: lb/hr = (Stack Concentration (ppm)) * (estimated flowrate (ft3/min)) * (Molecular weight of calibration gas) * (1.55 E-7). The calculated value shall be corrected to standard conditions. Monitoring shall occur at the frequency required for monitoring VOC concentration (ppm) limits. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(A)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U1 Pilot Plant

Operating Scenario: OS1 V-101

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	VOC (Total) <= 3.5 lb/hr. [N.J.A.C. 7:27-16.16(c)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination. Emission rates shall be calculated using the VOC emission concentration in ppm determine during required stack monitoring, the stack gas flow rate determined at the point of monitoring, and the molecular weight of the monitor's calibration gas as follows: lb/hr = (Stack Concentration (ppm)) * (estimated flowrate (ft3/min)) * (Molecular weight of calibration gas) * (1.55 E-7). The calculated value shall be corrected to standard conditions. Monitoring shall occur at the frequency required for monitoring VOC concentration (ppm) limits.[N.J.A.C. 7:27-8.13(d)1].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. Records of all calculations shall be maintained on-site for a minimum of five (5) years.[N.J.A.C. 7:27-16.22(a)].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U1 Pilot Plant

Operating Scenario: OS1 V-101

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
2	VOC (Total) <= 0.05 lb/hr. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Monitored by periodic emission monitoring (portable instrument) each week during operation, based on an instantaneous determination Emission rates shall be calculated using the VOC emission concentration in ppm determined during required stack monitoring, the stack gas flow rate determined at the point of monitioring, and the molecular weight of the monitor's calibration gas as follows" lb/hr = (Stack concentration (ppmv))*{estimated flowrate (ft3/min)} (Molecular weight of the calibration gas)*(1.55 E-7). The calculated value shall be corrected to standard conditions. Monitoring shall occur at the frequency required for monitoring VOC concentration (ppm) limits. [N.J.A.C. 7:27-8.13(a)].	VOC (Total): Recordkeeping by manual logging of parameter each week during operation. [N.J.A.C. 7:27-8.13(a)].	

Subject Item: U1 Pilot Plant

Operating Scenario: OS Summary

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	VOC (Total) <= 0.2 tons/yr. [N.J.A.C. 7:27-8.13(h)].	VOC (Total): Monitored by calculations annually: once per calendar year, based on a 12 calendar month average. [N.J.A.C. 7:27-8.13(d)2].	VOC (Total): Recordkeeping by manual logging of parameter annually: once per calendar year. [N.J.A.C. 7:27-8.13(d)3].	

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U2 Generators

Operating Scenario: OS4 Main Generat

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Particulate Emissions <= 1.69 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
2	VOC (Total) <= 1.96 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
3	Carbon monoxide <= 5.18 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
4	Sulfur Dioxide <= 1.58 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
5	Nitrogen oxides <= 24.1 lb/hr. [N.J.A.C. 7:27-8.13(h)].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U2 Generators

Operating Scenario: OS3 Aerator

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Particulate Emissions <= 0.5 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
2	VOC (Total) <= 0.58 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
3	Carbon monoxide <= 1.54 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
4	Sulfur Dioxide <= 0.471 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
5	Nitrogen oxides <= 7.16 lb/hr. [N.J.A.C. 7:27-8.13(h)].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U2 Generators

Operating Scenario: OS2 No. 2 Pump

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Particulate Emissions <= 0.54 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
2	VOC (Total) <= 0.62 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
3	Carbon monoxide <= 1.65 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
4	Sulfur Dioxide <= 0.503 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
5	Nitrogen oxides <= 7.65 lb/hr. [N.J.A.C. 7:27-8.13(h)].			

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U2 Generators

Operating Scenario: OS1 No. 1 Pump

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	Particulate Emissions <= 0.54 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
2	VOC (Total) <= 0.62 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
3	Carbon monoxide <= 1.65 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
4	Sulfur Dioxide <= 0.503 lb/hr. [N.J.A.C. 7:27-8.13(h)].			
5	Nitrogen oxides <= 7.65 lb/hr. [N.J.A.C. 7:27-8.13(h)].			

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Facility Specific Requirements

Subject Item: U2 Generators

Operating Scenario: OS Summary

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
1	TSP <= 1.18 tons/yr. [N.J.A.C. 7:27-8.13(h)].			
2	Nitrogen oxides <= 16.75 tons/yr. [N.J.A.C. 7:27-8.13(h)].			
3	VOC (Total) <= 1.37 tons/yr. [N.J.A.C. 7:27-8.13(h)].			
4	Carbon monoxide <= 3.6 tons/yr. [N.J.A.C. 7:27-8.13(h)].			
5	Sulfur Dioxide <= 1.1 tons/yr. [N.J.A.C. 7:27-8.13(h)].			

Section E

Facility Name: BIOGENESIS PILOT PLANT
Facility ID No.: 12071
Activity ID No.: PCP980001

INVENTORIES

Equipment Inventory
Control Device Inventory
Emission Point Inventory
Emission Unit Inventory

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Equipment Inventory

Equip. NJID	Facility's Designation	Equipment Description	Equipment Type	Certificate Number	Install Date	Grand-Fathered	Last Mod. (Since 1968)	Equip. Set ID
E1	V-101	Mix Tank	Other Equipment		11/15/98	No		
E2	V-102	Aerator	Other Equipment		11/15/98	No		
E3	V-103	Collision Chamber	Other Equipment		11/15/98	No		
E4	T-101	Raw Sediment Storage	Storage Vessel		11/15/98	No		
E10	No. 1 Pump	Water Blaster No. 1 Pump	Stationary Internal Combustion Engine		11/15/98	No		
E11	No. 2 Pump	Water Blaster No. 2 Pump	Stationary Internal Combustion Engine		11/15/98	No		
E12	AE Generator	Aerator Electric Generator	Stationary Internal Combustion Engine		11/15/98	No		
E13	Main Generat	Main Electric Generator	Stationary Internal Combustion Engine		11/15/98	No		

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Control Device Inventory

CD NJID	Facility's Designation	Description	CD Type	Install Date	Grand-Fathered	Last Mod. (Since 1968)	CD Set ID
CD1	V-102(prim)	Aerator Carbon System	Adsorber	11/15/98	No		
CD2	V-102(secon)	Aerator Carbon System	Adsorber	11/15/98	No		
CD3	V-103	Collision Chamber Carbon System	Adsorber	11/15/98	No		

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Emission Point Inventory

PT NJID	Facility's Designation	Description	Config.	Equiv. Diam. (in.)	Height (ft.)	Dist. to Prop. Line (ft)	Exhaust Temp. (deg. F)			Exhaust Vol. (acfm)			Discharge Direction	PT Set ID
							Avg.	Min.	Max.	Avg.	Min.	Max.		
PT1	V-102	Aerator Stack	Round	4	10	110	70.0	50.0	90.0	1,100.0	1,000.0	1,150.0	Up	
PT2	V-103	Collision Chamber	Round	4	10	100	70.0	50.0	90.0	40.0	20.0	50.0	Up	
PT3	V-101	Pretreatment Tank	Round	4	8	115	70.0	50.0	90.0	5.0	0.0	10.0	Up	
PT10	PT10	Water Blaster No. 1 Pump Engine Exhaust	Round	2	3	100	1,000.0	900.0	1,200.0	1,100.0	1,000.0	1,350.0	Up	
PT11	PT11	Water Blaster No. 2 Pump Engine Exhaust	Round	2	3	100	1,000.0	900.0	1,200.0	1,100.0	1,000.0	1,350.0	Up	
PT12	PT12	Aerator Electric Generator Exhaust	Round	2	3	100	1,000.0	900.0	1,200.0	1,100.0	1,000.0	1,300.0	Up	
PT13	PT13	Main Electric Generator Exhaust	Round	2	3	150	1,000.0	900.0	1,200.0	3,000.0	2,500.0	4,000.0	Up	
PT99	T-101	Process fugitives from Tank T-101 (E4)	Round	4	13	160	70.0	50.0	90.0	5.0	0.0	10.0	Up	

BIOGENESIS PILOT PLANT (12071)
PCP980001

Date: 1/21/99

New Jersey Department of Environmental Protection
Emission Unit/Batch Process Inventory

U 1 Pilot Plant BioGenesis Pilot Plant Process

UOS NJID	Facility's Designation	UOS Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Annual Oper. Hours Min.	Annual Oper. Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
OS1	V-101	Mix Tank	Normal - Steady State	E1		PT99		0.0	2,160.0		0.0	10.0	50.0	90.0
OS2	V-102	Aerator	Normal - Steady State	E2	CD1 (P) CD2 (S)	PT1		0.0	720.0		0.0	1,150.0	50.0	90.0
OS3	V-103	Collision Chamber	Normal - Steady State	E3	CD3 (P)	PT2		0.0	720.0		0.0	10.0	50.0	90.0
OS4	T-101	Raw Sediment Storage Tank	Normal - Steady State	E4		PT3		0.0	2,160.0		0.0	10.0	50.0	90.0

U 2 Generators Electric Generators

UOS NJID	Facility's Designation	UOS Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Annual Oper. Hours Min.	Annual Oper. Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
OS1	No. 1 Pump	Water Blaster Pump No. 1 Engine	Normal - Steady State	E10		PT10		0.0	720.0		1,100.0	1,350.0	900.0	1,200.0
OS2	No. 2 Pump	Water Blaster Pump No. 2 Engine	Normal - Steady State	E11		PT11		0.0	720.0		1,100.0	1,350.0	900.0	1,200.0
OS3	Aerator	Aerator Electric Generator	Normal - Steady State	E12		PT12		0.0	720.0		1,100.0	1,300.0	900.0	1,200.0
OS4	Main Generat	Main Electric Generator	Normal - Steady State	E13		PT13		0.0	720.0		3,000.0	4,000.0	900.0	1,200.0

Section F

Facility Name: BIOGENESIS PILOT PLANT
Facility ID No.: 12071
Activity ID No.: PCP980001

PERMIT ACTION APPEAL FORM
AIR QUALITY PERMITTING PROGRAM

Purpose: You are eligible to appeal this agency action. To appeal this agency action, complete the information requested herein and return the information to the addresses listed in H below. The filing of this information constitutes a request for an adjudicatory hearing pursuant to N.J.A.C. 7:27-1.32. The adjudicatory hearing request must be received by the Department within twenty (20) calendar days of your receipt of this agency action.

I. Permit Action Appealed: _____
Issuance Date of Agency Action: _____
Application Activity ID No.: _____

II. Person Requesting Hearing:
Name: _____
Name of Authorized Representative (Attorney or Consultant): _____
Company: _____
Company Address: _____
_____
Address of Attorney: _____
_____
Contact for further information: _____
Telephone Number: _____

III. Please Include the Following Information as Part of Your Request:

A. A copy of the letter transmitting the action
B. List of all permit conditions and issues contested
C. The legal and factual questions at issue including remedy for each contested issue
D. Suggested remedy for each contested issue
E. An estimate of the time required for the hearing
F. A request, if necessary, for a barrier-free hearing location for physically disabled persons
G. A clear indication of any willingness to negotiate a settlement with the Department prior to the hearing with the Office of Administrative Law; and
H. This form, completed, signed and dated with all of the information listed above, including attachments, to:

Office of Legal Affairs
Attention: Adjudicatory Hearing Requests
Department of Environmental Protection
401 East State Street
PO Box 402, Trenton, New Jersey 08625-0402

Copy to:

Air Quality Regulation
Attention: Adjudicatory Hearing Requests
401 East State Street
PO Box 027, Trenton, New Jersey 08625-0027

I. A request for a stay of this action (if applicable) pursuant to N.J.A.C. 7:27-1.33. If a stay is requested, the request must include evidence that one of the following circumstances exist:
1. N.J.A.C. 7:27-1.33(a)1; or
2. N.J.A.C. 7:27-1.33(a)2

IV. Signature:_____ Date:_____

HACKENSACK MEADOWLANDS DEVELOPMENT COMMISSION
One DeKorte Park Plaza • Lyndhurst, New Jersey 07071-3799
Administrative Offices: (201) 460-1700 Environment Center: (201) 460-8300
Fax: (201) 460-1722

JANE KENNY
Chairman

ALAN J. STEINBERG, ESQ.
Executive Director

January 15, 1999

Mr. John G. Sontag, Jr.
Roy F. Weston, Inc.
One Weston Way
West Chester, PA 19380-1499

Re: HCIA / ITEX Site Improvement
(BioGenesis Sprung Building, Temporary)
File: 97-448

Dear Mr. Sontag:

This Office has recently completed its review of your **revised** plans in connection with the proposed temporary "sprung building" structure to enclose the BioGenesis Pilot System on the southern tract of the former Kopper's Coke/Seaboard site at Fish House Road, north of Belleville Turnpike, Block 287, on parts of Lots 54, 56, 60, 62, 70 and 72 in the Town of Kearny, Hudson County, New Jersey (hereinafter, "the Property"). **Revisions to this Zoning Certificate are in bold.**

Our review and the following Zoning Certificate approval are limited to the temporary placement of a structure to cover the temporary BioGenesis Pilot Plant proposed to be located on Block 287, Lot 73, known as the southern tract of the Property (hereinafter, "Southern Tract"), more particularly described in the following documents and/or drawings:

I. Plan entitled "Site Plan, Former Koppers Seaboard Site, Southern Area", Dwg. No. 2000, prepared by Weston Consultants, latest revision date **12/16/98.**
II. Plan entitled "Details, Former Koppers Seaboard Site, Southern Area", Dwg. No. 2001, prepared by Weston Consultants, latest revision date 11/10/98.
III. Manufacturer's literature for Sprung Instant Structures Inc.

Based on our review, we have determined that the proposed structure to be located on the Southern Tract conditionally complies with the Commission's Heavy Industrial Zoning Regulations, and we are therefore approving your Temporary Zoning Certificate application with the following conditions:

1. This approval applies only to the temporary placement of a "sprung instant structure" in conjunction with the approved temporary pilot system for the demonstration of sediment washing technology on the Southern Tract. The work involved consists of the installation of an asphalt pad and the erection of

an aluminum frame structure connected to and covered by a high tensioned all-weather outer membrane. **Also included is the placement of three (3) temporary 1000 gallon propane storage tanks, located to the south of the proposed structure.** The area of the 6 acres Southern Tract to be occupied by the proposed structure and pilot system shall be approximately 140′ by 260′ in size, **plus an area approximately 40′ by 70′ for the propane storage tanks.**

2. The temporary structure shall be removed upon completion of pilot plant operation or by the expiration date of this Zoning Certificate, which ever occurs first. **Currently, the ultimate plans for the development of the Property which are under review by this Office do not indicate any development or fill on the Southern Tract. Therefore, the asphalt pad shall be either removed from the site or a plan shall be submitted to this Office, showing the incorporation of the asphalt pad into the placement of fill on the Southern Tract, within one (1) year of the date of issuance of this approval. If the asphalt pad is to be removed, then** the disturbed area shall be restored to original grade and condition.

3. This approval shall be valid for a period of six (6) months from the date of issuance, in order to allow for installation and removal of the structure, as per item no. 2 above.

4. No work shall take place in wetland areas situated in the vicinity of the Southern Tract. The wetlands areas located on the Southern Tract shall be protected by the installation of protective devices such as hay bales or silt fence.

5. Any document, report, plan, study, test result or the like prepared by or for the applicant or others in connection with the work which may have a bearing on this Zoning Certificate approval shall be immediately forwarded by the applicant to this Office for review. Without limitation, such documentation may include that which is produced in connection with:

   A. Any geotechnical or groundwater monitoring activities.
   B. Any reports required by the NJDEP or other State or Federal agencies.
   C. Any incident or compliance reporting required by OSHA, the "Institutional Controls Plan" and the "Health and Safety Plan" contained therein.
   D. Any job meeting reporting activity.
   E. Any laboratory testing or analytical activity in connection with the sampled raw dredge material and processed dredge material.

   Should the review of any such document submitted indicate to this Office that the Zoning Certificate approval issued herein is or may be materially

affected, further clarification may be sought by this Office, and additional or modified approvals may be required.

6. This Office shall be given a minimum of three (3) working days advance notice of any regularly scheduled status or progress meeting, or any meeting with any agency and the applicant which has a bearing on this Zoning Certificate approval.

7. This Zoning Certificate does not supersede, modify, alter or amend the terms and conditions of the Zoning Certificate ZC-97-448 (BioGenesis, Temporary), dated October 8, 1997, currently in effect for the temporary installation of a pilot unit for the processing of up to 500 CY of dredge material on the Southern Tract. All terms and conditions currently in effect, and any subsequent revisions thereto, for Zoning Certificate ZC-97-448 (BioGenesis, Temporary) shall remain in full force and effect unless specifically superseded by any future Zoning Certificate.

8. This Zoning Certificate does not supersede, modify, alter or amend the terms and conditions of the Zoning Certificate ZC-97-448 (Central), dated September 30, 1997, currently in effect for the interim placement of fill in the central area. All terms and conditions currently in effect, and any subsequent revisions thereto, for Zoning Certificate ZC-97-448 (Central) shall remain in full force and effect unless specifically superseded by any future Zoning Certificate.

9. This Zoning Certificate does not supersede, modify, alter or amend the terms and conditions of the Zoning Certificate ZC-97-448 (Eastern, Temporary), dated June 11, 1998, currently in effect for the temporary placement of fill in the eastern drying area. All terms and conditions currently in effect, and any subsequent revisions thereto, for Zoning Certificate ZC-97-448 (Eastern, Temporary) shall remain in full force and effect unless specifically superseded by any future Zoning Certificate.

10. This Zoning Certificate does not supersede, modify, alter or amend the terms and conditions of the Zoning Certificate ZC-97-448 (Western, Temporary), dated August 25, 1998, currently in effect for the temporary placement of fill in the western drying area. All terms and conditions currently in effect, and any subsequent revisions thereto, for Zoning Certificate ZC-97-448 (Western, Temporary) shall remain in full force and effect unless specifically superseded by any future Zoning Certificate.

11. **The proposed petroleum tanks are approved for zoning purposes only and are subject to approval by the New Jersey Department of Labor.**

This letter shall serve as your Zoning Certificate, designated **ZC-97-448 (BioGenesis Structure, Temporary, Revised)**, and **shall be valid for a period of six (6) months from the date of issuance. This is not an approval to start construction. Application must be made to the Town of Kearny for a construction permit.** Please find enclosed a copy of the following approved plans:

Dwg. No.	Title	Prepared by	Dated
2000	Site Plan, Former Koppers Seaboard Site, Southern Area	Weston Consultants	**12/16/98***
2001	Details, Former Koppers Seaboard Site, Southern Area	Weston Consultants	11/10/98

*** Only a copy of dwg. No. 2000 is included in this revised approval package.**

The applicant is hereby advised of his/her responsibility to investigate and obtain all federal, state, and local permits which may pertain to his/her proposal or project. The Hackensack Meadowlands Development Commission will not be held liable for any damage which may result from the applicant's failure to obtain the necessary approvals from all respective agencies having jurisdiction. This Office must receive copies of all federal, state, and local permits which may pertain to the proposal, and "as-built" plans, before it will issue a Certificate of Completion.

This letter is an agency determination, decision, and administrative order. Pursuant to N.J.A.C.19:4-6.25(b), if you wish to appeal this decision, a written notice of appeal must be filed, by certified mail, with the Office of the Chief Engineer within fifteen (15) days of the date of this decision. The notice of appeal shall specify the grounds for such appeal. Upon receipt of the notice of appeal, the Executive Director or his designee shall transmit to the Office of Administrative Law all papers as required by the Office of Administrative Law pursuant to N.J.A.C. 1:1-8.2.

If you should have any questions, please contact Sharon A. Mascaró of this Office.

Sincerely,

OFFICE OF THE CHIEF ENGINEER

Sharon A. Mascaró

RECOMMENDED BY:

Sharon A. Mascaró, P.E.
Senior Staff Engineer

Robert E. Bratt

APPROVED BY:

Robert E. Bratt, P.E., P.P.
Chief Engineer

Enclosure

cc: Robert Armstrong, Kearny Construction Official
Gary Lipsius, NJDEP
Thomas Calvanico, HCIA
Frank Capece, Esq.
Rich G. Studer, IRL
Kent Loest, SK Services
Andrew R. Davis, HMDC
Debbie Dakin, HMDC
Bruno Rondi, HMDC
HMMC

201 955 7880

TOWN OF KEARNY- ANNEX
410 KEARNY AVE
KEARNY NJ 07032

Date Issued 01/06/99
Control #
Permit # 99-0009

UCC NEW JERSEY

CONSTRUCTION PERMIT

IDENTIFICATION Block 287 Lot 73 Qual

Work Site Location 1 FISH HOUSE ROAD

Owner in Fee ECDC
Address 140 MARSH STREET
NEWARK, NJ 07114-
Telephone (201)656-1530

Contractor ROY F. WESTON
Address 1 WESTON WAY
WEST CHESTER, PA 19380-
Telephone (610)701-3186
Lic. No. or Bldrs. Reg. No.
Federal Emp. No.

Is hereby granted permission to perform the following work:

[X] BUILDING [ ] PLUMBING [ ] LEAD HAZARD ABATEMENT
[X] ELECTRICAL [X] FIRE PROTECTION [ ] DEMOLITION
[ ] ELEVATOR DEVICES [ ] ASBESTOS ABATEMENT (Subchapter 8 only) [ ] OTHER

DESCRIPTION OF WORK:
INSTALL TEMPORARY TENT STRUCTURE ON PROPERTY

NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work $ 40,000

Construction Official

01/06/99
Date

U.C.C. F170 (rev. 3/96)

PAYMENTS (Office Use Only)

Building	4,320
Electrical	114
Plumbing	0
Fire Protection	40
Elevator Devices	0
Other	
DCA Training Fee	480
Cert. of Occupancy	240
Other	
Total Incl Cred	5,194
Check No.	517
Cash	
Collected By	MJM

BUILDING SUBCODE TECHNICAL SECTION

NEW JERSEY UNIFORM CONSTRUCTION CODE

Date Received 1/6/99
Date Issued
Control #
Permit # 99-0009

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 287 Lot 73
Work Site Location FORMER KOPPERS SEABOARD SITE
1 FISH HOUSE ROAD, KEARNY, NJ 07032
Owner in Fee SK Services
Address 1 FISH HOUSE ROAD
KEARNY, NJ 07032
Tele. (201) 246-8512
Contractor ROY F. WESTON
Address 1 WESTON WAY
WEST CHESTER, PA 19380
Tele. (610) 701-3737 Fax (610) 701-3186
Lic. No. or Bldrs. Reg. No.
Federal Emp. No.

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Signature [signature]

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK
Installation of Sprung Building (Temporary 2-3 month duration) to house Pilot Scale Sediment Washing Demonstration Project Sprung Building will be placed on an Asphalt Pad as indicated on attached drawings.

JOB SUMMARY (Office Use Only)

PLAN REVIEW	Date	Initial	INSPECTIONS Type:	Failure	Dates (Month/Day) Failure	Approval	Initial
[ ] No Plans Required			Footing				
[ ] All			Foundation				
[ ] Footing			Slab				
[ ] Foundation			Frame				
[ ] Frame			Barrier-Free				
[ ] Other			Insulation				
Joint Plan Review Required:			Finishes				
[ ] Elec. [ ] Plumb. [ ] Fire [ ] Elevator			Energy				
SUBCODE APPROVAL			Mechanical				
[ ] CO [ ] CCO [ ] CA			TCO				
Date:			Other				
Approved by:			Final				
			Barrier-Free				

TYPE OF WORK:
[X] New Building - Temporary
[ ] Addition
[ ] Alteration
[ ] Roofing - 20% Loss Plan Review
[ ] Siding
[ ] Fence _____ Height (exceeds 6')
[ ] Sign _____ Sq. Ft.
[ ] Pool
[ ] Asbestos Abatement Subchapter 8
[ ] Lead Haz. Abatement NJAC 5:17
[ ] Other _____
[ ] Demolition

FEE (Office Use Only)

$	~~4320~~
	5400
	1080
	4320
	~~240~~
C.O.	4560
Administrative Surcharge $	
Minimum Fee $	
DCA Training Fee $	480
TOTAL FEE $	5040—

B. BUILDING CHARACTERISTICS

Use Group Present _____ Proposed XF-1
Constr. Class Present _____ Proposed X
No. of Stories 1
Height of Structure 36 Ft.
Area — Largest Floor 9650 Sq. Ft.
New Bldg. Area/All Floors 9650 Sq. Ft.
Volume of New Structure N 300,000 Cu. Ft.
Total Land Area Disturbed 37,500 Sq. Ft.

Est. Cost of Bldg. Work:
1. New Bldg. $ 20,000/month lease
2. Alteration $ 0
3. Total (1+ 2) $ 20,000/month lease

~~Ck # 056485 in Office~~
Check returned to contractor due to combined fee here

U.C.C. F110 (REV. 3/96)

White - Office Copy • Canary - Applicant Copy • Card - Inspector Copy

Check # ~~0 #0~~ 057091

CONSTRUCTION CODE ENFORCEMENT DEPARTMENT
KEARNY, N. J.

ELECTRICAL SUBCODE TECHNICAL SECTION

Date Received 1/6/99
Date Issued
Control #
Permit # 99-0009

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 287 Lot 73
Work Site Location FORMER KOPPERS SEABOARD SITE
1 FISH HOUSE ROAD, KEARNY, NJ 07032
Owner in Fee SK SERVICES
Address 1 FISH HOUSE RD.
KEARNY, NJ 07032
Tele. (201) 246 8512
Contractor ANYTHING ELECTRIC CO
Address 18 CHURCH STREET
MILFORD, NJ 08848
Tele. (908) 9952876
Lic. No. 8635
Federal Emp. No. 22-3458987 or Social Security No.

B. ELECTRICAL CHARACTERISTICS

Use Group Present Proposed TEMPORARY INSTALLATION
[ ] Pole/Pad # [X] Temporary [ ] Other
Building Occupied as Utility Co.
Est. Cost of Elec. Work $ 15,000

JOB SUMMARY (Office Use Only)

PLAN REVIEW:
[ ] No Plans Required
Joint Plan Review Required:
[ ] Bldg. [ ] Plumb.
[ ] Fire [ ] Elevator
[ ] Elec. Plans Approved
Date:
Approved by:

SUBCODE APPROVAL
[ ] CO [ ] CCO [ ] CA
Date:
Approved By:

INSPECTIONS Type:	Failure	Failure	Approval	Initial
Rough				
Temporary				
Constr. Serv.				
TCO				
Other				
Service				
Final				

Dates (Month/Day)

Temp. Cut-in-Card Date Issued
Final Cut-in-Card Date Issued

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

Signature—Contractor Seal

[X] Licensed Electrical Contractor [ ] Exempt Applicant

D. TECHNICAL SITE DATA

NO.	SIZE	ITEM	FEE (Office Use Only)
10		Fixtures (1)	
6		Receptacles (2)	
2		Switches (3)	
18		Total 1 + 2 + 3	36
	Kw	Range	
	Kw	Oven(s)	
	Kw	Surface Unit	
	hp	Dishwasher	
	hp	Garbage Disposal	
	Kw	Dryer	
	Kw	A/C Unit	
		Burglar Alarms	
		Intercoms Panels	
		Smoke Detectors	
	hp	Whirlpool/spa	
		Pool Bonding	
	hp	Pool Filter Motor	
		Pool Lights	
	Kw	Water Heater(s)	
	Kw	Central heat: oil, gas or elec.	
	Kw	Baseboard Heat Units	
		Thermostats	
	hp	Heat Pump	
	hp	Pump(s)	
	Amp	Motor Control Center/Sub Panels	
		Signs	
		Light Standards	
	hp	Motors—Fractional H.P.	
	hp	Motors—All Others	
	Kw	Transformers	
	Kw	Generators	
600	Amp	Service Entrance	92
		Other	

Administrative Surcharge	$	128
Minimum Fee	$	26
DCA Training Fee	$	102
TOTAL FEE	$	12
	$	114—

Paid [ ] Check # ~~056985~~ -25%
Collected by: TOD - [illegible]

U.C.C. Form F-120B Check returned 12/15/98 [illegible]

White = Office Copy • Canary = Applicant Copy • Card = Inspector Copy

FIRE SUBCODE TECHNICAL SECTION

NEW JERSEY UNIFORM CONSTRUCTION CODE

Date Received 1/6/99
Date Issued
Control #
Permit # 99-0009

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 287 Lot 73
Work Site Location FORMER KOPPERS SEABOARD SITE
1 FISH HOUSE ROAD, KEARNY, NJ 07032
Owner in Fee SK SERVICES
Address 1 FISH HOUSE ROAD
KEARNY, NJ 07032
Tele. (201) 246 · 8512
Contractor ROY F. WESTON, INC
Address 1400 WESTON WAY
WEST CHESTER, PA 19380
Tele. (610) 701 · 3737 Fax (610) 701 - 3186
Lic. No.
Federal Emp. No.

B. FIRE PROTECTION CHARACTERISTICS

Use Group Present ____ Proposed F-1
Constr. Class Present ____ Proposed ____
Heating Systems [X] New [ ] Existing [ ] HVAC
Type: [X] Gas [ ] Oil [ ] Electric [ ] Solar
[X] Other TEMPORARY
Location:
Total Cost of Fire Protection Work $ $800-

Fire Alarm System
New [ ] Existing [ ]
Location of Panel:
Fire Suppression/Standpipe System
New [ ] Existing [ ]
Location of Main Control Valve:

JOB SUMMARY (Office Use Only)

PLAN REVIEW
[ ] No Plans Required
Joint Plan Review Required:
[ ] Building [ ] Plumbing
[ ] Electric [ ] Elevator
[ ] Fire Plans Approved
Date:
Approved by:

SUBCODE APPROVAL
[ ] CO [ ] CCO [ ] CA
Date:
Approved by:

INSPECTIONS Type:	Failure	Dates (Month/Day) Failure	Approval	Initial
Alarm System				
Suppression Sys.				
Standpipe				
Fire Pump				
Pre-Eng. System				
Mechanical				
Smoke Control				
TCO				
Final				
Other				

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Signature

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK: TEMPORARY INSTALLATION OF A HEATER (2-3 MONTHS)

Water Supply Source N/A
Method of Alarm/Suppression System Supervision

	NUMBER	FEE (Office Use Only)
Storage Tanks		
Type: [ ] Flammable Liquid [ ] Combustible Liquid		
[X] LPG [ ] LNG Capacity (3) 1000 gal Fuel		
Alarm Systems [ ] 110v Interconnected [ ] System		
Alarm Devices (i.e., smoke, heat, pulls, water/flow)		
Supervisory Devices (i.e., tampers, low/high air)		
Signaling Devices (i.e., horn/strobes, bells)		
Other Devices		
TOTAL		
Suppression Systems		
Fire Pump ____ GPM Type ____		
Dry Pipe/Alarm Valves		
Pre-action Valves		
Sprinkler Heads (Dry and Wet)		
Standpipes		
Pre-engineered Systems		
Wet Chemical		
Dry Chemical		
CO_2 Suppression		
Foam Suppression		
Halon Suppression		
X Other 2 MM Btu/HR TEMP. HEATER	1	45-
Kitchen Hood Exhaust System		20%
Smoke Control System		
Gas [ ] or Oil [ ] Fired Appliances		36
Other		

Administrative Surcharge	$	
Minimum Fee	$	4-
DCA Training Fee	$	
TOTAL FEE	$	40-

Check # 517

U.C.C. F140 (REV. 3/96)

White - Office Copy • Canary - Applicant Copy • Card - Inspector Copy

HACKENSACK MEADOWLANDS DEVELOPMENT COMMISSION
One DeKorte Park Plaza • Lyndhurst, New Jersey 07071-3799
Administrative Offices: (201) 460-1700 Environment Center: (201) 460-8300
Fax: (201) 460-1722

JAN KEAN
Chairman

ALAN J. STEINBERG, ESQ.
Executive Director

February 1, 1999

Mr. Robert J. Armstrong
Construction Official
Town of Kearny
400 Kearny Avenue
Kearny, New Jersey 07032

Re: HCIA/ITEX Site Improvement (Sprung Structure)
File: 97-448

Dear Mr. Armstrong:

This Office has recently conducted a final inspection of the HCIA-ITEX Sprung Structure. These premises are located at 1 Fish House Road, Block 287, Lots 70, 70R, 71R & 80, in Kearny, New Jersey.

Based on the above, it appears that construction has been completed in accordance with the approved plan. As per N.J.A.C. 19:6-1.8(a), and as per HMDC Zoning Regulations N.J.A.C. 19:4-4.137, please accept this letter as our Certificate of Completion and Occupancy Certification, designated CT- 97-448, as follows:

Use Group:	F-1
Type of Construction:	2-C
Max. Occupancy:	97 Occupants
Max. Live Load:	150 psf

The applicant is advised by copy of this letter that this Certificate is subject to ALL inspections, as well as approvals by the municipal subcode officials. Furthermore, the applicant must obtain a Certificate of Occupancy from the Municipal Construction Official prior to occupancy of the premises.

The applicant is hereby advised of his responsibility to investigate and obtain all federal, state, and local permits which may pertain to his proposal or project. The Hackensack Meadowlands Development Commission will not be held liable for any damages which may result from the applicant's failure to obtain the necessary approvals from all respective agencies having jurisdiction.

If there are any questions, please contact Ralph Venturini or Sharon Mascaro of this Office.

Sincerely,

OFFICE OF THE CHIEF ENGINEER

Jan Ruman

Jan Ruman, P.E., P.P.
Supervisor of Plan Review

Robert E. Bratt

Robert E. Bratt, P.E., P.P.
Chief Engineer

c: John G. Sontag, Jr., P.E., Weston
Gabe Cifolelli, Weston
HMMC

WATERS, MCPHERSON, MCNEILL
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
SECAUCUS - TRENTON - NEW YORK
MEADOWLANDS OFFICE
300 LIGHTING WAY
P.O. BOX 1560
SECAUCUS, NEW JERSEY 07096
201-863-4400

FRANK G. CAPECE

DIRECT DIAL
201-330-7455

TELECOPIER
201-863-2866

February 8, 1999

VIA COURIER
Michael Urbanski
Passaic Valley Sewerage Commissioners
500 Wilson Avenue
Newark, New Jersey 07105

RE: Agreement for Wastewater Disposal w/SK Services (East), L.C.
Our File No.: 8162-001

Dear Mr. Urbanski:

Enclosed is the Agreement with SK Services (East), L.C., for the treatment and disposal of wastewater from the BioGenesis Decontamination Demonstration Project in Kearny, which has been executed on behalf of SK Services and Clean Ventures, Inc.

Please return one copy of the Agreement to us after it is executed on behalf of PVSC.

Thank you.

Very truly yours,

Waters, McPherson, McNeill, P.C.

By: _____
FRANK G. CAPECE

FGC:JPB/jaz
Enclosure
cc: K. Loest (w/enclosure)
K. Mullins (w/enclosure)
J. Sontag (w/enclosure)

AGREEMENT

THIS AGREEMENT made this day of , 199 .

BETWEEN: THE PASSAIC VALLEY SEWERAGE COMMISSIONERS, a public corporation of the State of New Jersey (herein referred to as the "PVSC");

AND: SK SERVICES (East) L.C.
1 FISH HOUSE ROAD
KEARNY, NJ 07032

(herein referred to as the "CUSTOMER").

W I T N E S S E T H:

WHEREAS, PVSC owns and operates a wastewater treatment facility located in Newark, New Jersey, generally referred to as the PVSC Wastewater Treatment Plant; and

WHEREAS, the PVSC Wastewater Treatment Plant has waste disposal facilities and capabilities; and

WHEREAS, the CUSTOMER is performing a pilot scale sediment washing demonstration project and desires to have the wastewater from the project treated and disposed of by the PVSC; and

WHEREAS, the PVSC is agreeable to treatment and disposal of the waste of the CUSTOMER subject to certain terms and conditions including terms for the fixing of fees for treatment and disposal of the waste and other related matters;

NOW, THEREFORE, in consideration of these premises and of the mutual covenants and agreements herein set forth, and of the undertakings of each party to the other, the parties hereto, each binding itself, its successors and assigns, do mutually covenant, promise and agree as follows:

Section 1. GENERAL SCOPE OF THE CONTRACT

The CUSTOMER agrees to deliver its waste at no cost to the PVSC to the point of connection to the PVSC'S system, as designated by the PVSC. The waste shall be the product of the activity described in the CUSTOMER's Application, it shall meet all of the PVSC'S standards, including the applicable sections of PVSC's Rules and Regulations, and it shall not be detrimental to the PVSC'S treatment plant. The PVSC will accept the waste from the CUSTOMER subject to the limitations as set forth in Section 2 and the CUSTOMER will pay for the treatment of said waste in the amount and manner set forth hereinafter.

Section 2. TREATMENT OF THE CUSTOMER'S WASTE AND SERVICE CHARGES TO BE LEVIED THEREFOR

(a) The PVSC agrees to accept, treat and dispose of the total wastewater production of the **Pilot Scale Sediment Washing Demonstration Project**, during the term of this contract or any extension of it, based on the description provided in the attached CUSTOMER'S Application. The CUSTOMER expressly warrants and guarantees that it will deliver to PVSC 100% of the total production of wastewater to PVSC during the term of this contract. The CUSTOMER agrees that PVSC shall be the exclusive and sole provider of treatment and disposal of CUSTOMER'S waste during the term of this contract.

(b) The CUSTOMER shall not, however, discharge into the PVSC'S system:

1. Any prohibited waste as defined by Section 312 of the PVSC Rules and Regulations.

2. Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, wood or any other solid or viscous substance capable of causing obstruction to flow in pipes or other interference with the proper operation of the sewage works.

3. Any waste with a metal content substantially greater than contained in the documentation submitted in the Application for Trucked-In Liquid Waste.

4. PVSC reserves the right to sample any delivery before commencing discharge.

5. PVSC reserves the right to reject a delivery if information reveals that the introduction of the contents may negatively impact the operation of the PVSC system.

(c) In consideration for the treatment and disposal of waste by the PVSC, the CUSTOMER agrees to pay the PVSC at the rate specified in the PVSC's Letter of Approval attached hereto and made a part hereof. The PVSC shall have the right to adjust the aforesaid charges annually upon sixty (60) days written notice to the CUSTOMER effective on January 1 following the notice.

In the event that such adjusted charge is not agreed upon, either party may terminate this agreement on the charge effective date, provided such termination shall in no way relieve the obligation to pay any outstanding charge then due and owing or to become due and owing.

(d) At its discretion, the PVSC may base its charges, for waste deliveries, upon full truckloads, regardless of whether a full truckload is actually delivered to the PVSC'S treatment plant. The waste will be delivered at the sole cost of the CUSTOMER to the PVSC'S plant by a tank truck provided with either a gravity discharge or a self contained pump capable of discharging the waste through approximately 10 feet of a 4 or 6 inch discharge hose to the at grade connection point.

Section 3. PAYMENT AND TERM OF AGREEMENT

(a) The PVSC shall bill the CUSTOMER monthly for charges due on this Agreement. The charges shall be payable upon receipt by the customer of the monthly bill. Interest shall accrue at the rate of one and one half percent (1 1/2%) per month on charges not paid withinforty five (45) days of the billing date.

(b) The CUSTOMER will in each fiscal year make all budgetary and other provisions or appropriations necessary to provide for or authorize the payment to the PVSC during such fiscal year of the annual payments due hereunder.

(c) If the CUSTOMER defaults in any of its obligations on the terms of this agreement, the PVSC may terminate the services provided hereunder forthwith provided that such termination shall in no way relieve the obligation to pay any outstanding charges then due and owing or to become due and owing.

(d) It is expressly understood and agreed that the CUSTOMER is solely a contract customer of the PVSC and shall acquire by this contract no ownership capital, property rights or equity in the system or plant of the PVSC whatsoever nor shall the CUSTOMER acquire by said contract any rights, express or implied, to participate in any way in the operation or the administration of the PVSC, or participate in any capacity in any agreements or proceedings concerning the acquisition,

sale, lease or any other imposition of the PVSC'S property, including but not limited to participation in eminent domain proceedings.

(e) The term of this Agreement shall commence on the date the Agreement is executed and, unless sooner terminated in accordance with the terms of this Agreement, shall expire ONE YEAR from date of execution.

(f) Anything contained in this Agreement to the contrary notwithstanding, if the New Jersey Department of Environmental Protection (NJDEP), or any other governmental agency having jurisdiction over the PVSC or the subject matter of this Agreement, institutes a District Sludge Management Plan, or other plan of similar nature, which makes this Agreement unenforceable by its terms, then this Agreement shall terminate within sixty (60) days of implementation of the Plan. If the Plan renders any provision of this Agreement unenforceable, or requires changes and modifications in the Agreement which the PVSC is unwilling to accept, then the PVSC reserves the right to terminate this Agreement on sixty (60) days notice.

Section 4. ENFORCEMENT

(a) If the CUSTOMER violates any of the terms of this agreement, including but not limited to the limitations set forth in Section 2 (b), the PVSC may terminate the services provided hereunder forthwith and refuse to accept the waste into its system, provided that such termination shall in no way relieve the obligation to pay any outstanding charges then due and owing or to become due and owing, or constitute a waiver of any of the PVSC's rights to enforce this Agreement.

(b) In addition to its right of termination, the PVSC may assess a penalty of $500.00 for each delivery that violates Section 2 (b). Such payment shall be in addition to any other charges paid to the PVSC by the CUSTOMER under this Agreement.

(c) Furthermore, in the event any waste discharged by the CUSTOMER to the PVSC'S system does not meet the requirements of Section 2 (b), or any other provision of this Agreement or provision or regulation of any governmental agency having jurisdiction, and causes unusual maintenance or operating costs to be paid by the PVSC, or causes the PVSC to incur fines or penalties for violation of any USEPA, NJDEP, or other governmental agency, for violation of any law, rule or permit, then in any such case, the CUSTOMER shall reimburse the PVSC in full for such additional costs incurred, or fines or penalties assessed. Nonpayment of any costs or fines and penalties assessed shall constitute a default of this Agreement.

Section 5. COVENANT BY PVSC

The PVSC shall use reasonable diligence and care to provide waste treatment service at its sewage treatment plant for the use of the CUSTOMER. The PVSC shall not be liable for any failure to provide the services which are the subject of this Agreement, or for any interruption, or loss or damage resulting therefrom occasioned in whole or in part by any cause beyond the reasonable control of the PVSC or any cause considered an event of force majeure.

The PVSC shall not be responsible for any interruption or cessation of services due to the action of any governmental agency having jurisdiction over the PVSC. If the PVSC is unable to provide the service under the terms of this agreement because of failure to obtain the necessary approvals or licenses from the governmental agencies having jurisdiction over the PVSC, then this Contract shall become null and void.

Section 6. INDEMNIFICATION

The CUSTOMER agrees to indemnify and save the PVSC harmless from all damages and claims for damages, actual or alleged, suits, recoveries, judgments or executions (including costs, expenses and reasonable attorney's fees) which may be made, had, brought or recovered by reason of injury for and including death resulting therefrom, to any person whomsoever or damage to the property of any person whomsoever, arising out of the making and performance of this Agreement. This Agreement shall be made a part of the CUSTOMER'S Comprehensive General Liability Policy, and the PVSC shall also be designated as an additional named insured on such policy.

Section 7. INSURANCE

The CUSTOMER shall at its own cost and expense take out and maintain for the life of the contract and shall cause its subcontractors to obtain and maintain for the life of their subcontracts, all statutory insurance such as worker's compensation, bodily injury liability and property damage liability insurance and automobile and truck bodily injury liability and property damage insurance shall be provided in not less than the following amounts:

(a)	Injury or death to one person	$1,000,000
(b)	Injury or death to more than one person or more than a single occurrence	$1,000,000

(c) Property damage $1,000,000

(d) Property damage on account of all occurrences $1,000,000

The CUSTOMER shall have the PVSC named as an additional named insured on its policy for the coverages required by this contract, and a certificate of insurance evidencing the required insurance shall be filed by the CUSTOMER with the Executive Director of the PVSC.

Section 8. ASSIGNMENT PROHIBITED

No assignment or transfer of this Agreement or resale of the services provided hereunder shall be made without the express consent of PVSC in writing, and the CUSTOMER shall not permit any use or benefit to be made of this agreement by any other parties.

Section 9. PROPER PERFORMANCE OF CONTRACT

The PVSC reserves the right to decide all questions arising as to the proper performance of this Agreement.

Section 10. TESTING AND MONITORING

The CUSTOMER shall be responsible for waste sampling, testing, reporting or other requirement of the NJDEP and the USEPA and for the cost thereof, regarding monitoring for waste quality parameters including heavy metals and toxic organic chemicals; copies of the waste analysis reports sent to NJDEP and USEPA for the above parameters, shall be filed with the PVSC.

Section 11. SPILLAGE

Any spillage caused by the CUSTOMER, his hauler or his equipmet while on PVSC property, shall be the CUSTOMER's responsibility to properly clean up at the CUSTOMER's expense. The clean up shall meet all Federal and State requirements and regulations, including supplying all documentation. A copy of the CUSTOMER's spill response plan shall be submitted to the PVSC upon execution of this Contract.

IN WITNESS WHEREOF, the PVSC and CUSTOMER have caused their respective corporate seals to be hereto affixed and attested and these presents to be signed by their respective officers duly authorized and this agreement to be dated as of the date first above written.

ATTEST:

PASSAIC VALLEY SEWERAGE COMMISSIONERS

BY: _____

LOUIS LANZILLO, Clerk

ROBERT J.DAVENPORT, Executive Director

~~ATTEST~~: WITNESS

SK SERVICES (EAST) L.C.

BY: _____

PASSAIC VALLEY SEWERAGE COMMISSIONERS
TERMS AND CONDITIONS
for TRUCK DELIVERED NON-HAZARDOUS WASTES

Section 1. GENERAL

The CUSTOMER agrees to deliver TRUCK DELIVERED NON-HAZARDOUS WASTE at no cost to the PVSC to the point of connection to the PVSC's system, as designated by the PVSC. The truck delivered waste shall be non-hazardous, shall meet all of the PVSC's standards, including the applicable sections of PVSC's Rules and Regulations, and shall not be detrimental to the PVSC's treatment plant. The PVSC will accept the truck delivered waste from the CUSTOMER subject to the limitations as set forth in Section 2 and the CUSTOMER will pay for the treatment of said waste in the amount and manner set forth hereinafter. Truck Delivered Non-Hazardous Waste, Truck Delivered Waste, and Waste shall be deemed to be synonymous whenever they appear in this document

Section 2. TREATMENT OF THE CUSTOMER's TRUCK DELIVERED WASTE AND SERVICE CHARGES TO BE LEVIED THEREFOR

(a) The PVSC agrees to accept, treat and dispose of the CUSTOMER's Waste. The CUSTOMER expressly acknowledges that it shall pay PVSC charges for all amounts of Waste delivered.

By executing this document the CUSTOMER specifically agrees to the following:

(b) The CUSTOMER shall not, however, discharge into the PVSC's system:

1. Any prohibited waste as defined by Section 312 of the PVSC Rules and Regulations.

2. Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, wood or any other solid or viscous substance capable of causing obstruction to flow in pipes or other interference with the proper operation of the sewage works.

3. Any waste with a pollutant content greater than that contained in the documentation submitted in the Application to Discharge Liquid Waste.

4. Any waste which is Hazardous as defined by NJDEP or USEPA.

5. Mixtures of domestic septage and other wastes where approval was granted for domestic septage.

(c) PVSC reserves the right to sample any delivery before commencing discharge.

(d) PVSC reserves the right to reject a delivery if information reveals that the introduction of the contents may negatively impact the operation of the PVSC system.

(e) In consideration for the treatment and disposal of Waste by the PVSC, the CUSTOMER agrees to pay the PVSC at the rate approved by PVSC. The PVSC shall have the right to adjust the aforesaid charges annually upon sixty (60) days written notice to the CUSTOMER effective on January 1 following the notice.

(f) At its sole discretion, the PVSC may base its charges, for Waste deliveries, upon full truckloads, regardless of whether a full truckload is actually delivered to the PVSC's treatment plant. The Waste will be delivered at the sole cost of the CUSTOMER to the PVSC's plant by a tank truck provided with either a gravity discharge or a self-contained pump capable of discharging the Waste through approximately 50 feet of a 4-inch discharge hose to the at-grade discharge point.

Section 3. PAYMENT

(a) For a CUSTOMER whose monthly billing is estimated to be less than $1,000 per month, the CUSTOMER shall purchase appropriate Waste Disposal Tickets. For a CUSTOMER whose monthly billing is estimated to be $1,000 per month or greater, the PVSC shall bill the CUSTOMER monthly for charges due. The charges shall be payable upon receipt of the monthly bill by the CUSTOMER. Interest shall accrue at the rate of one and one half percent (1 1/2%) per month on charges not paid within forty five (45) days of the billing date.

(b) If the CUSTOMER defaults in any of its obligations, PVSC may terminate the services provided hereunder forthwith provided that such termination shall in no way relieve the obligation to pay any outstanding charges then due and owing or to become due and owing.

(c) It is expressly understood and agreed that the CUSTOMER shall acquire no ownership capital, property rights or equity in the system or plant of the PVSC whatsoever nor shall CUSTOMER acquire any rights, express or implied, to participate in any way in the operation or the administration of the PVSC, or participate in any capacity in any agreements or proceedings concerning the acquisition, sale, lease or any other imposition of the PVSC's property, including but not limited to participation in eminent domain proceedings as a result of the PVSC's treatment and disposal of CUSTOMER's sludge.

Section 4. ENFORCEMENT

(a) If the CUSTOMER violates any of the Terms and Conditions, including but not limited to the limitations set forth in Section 2 (b), the PVSC may terminate the services provided hereunder forthwith and refuse to accept the Waste into its system, provided that such termination shall in no way relieve the obligation to pay any outstanding charges then due and owing or to become due and owing, or constitute a waiver of any of the PVSC's rights.

(b) In addition to its right of termination, the PVSC may assess a penalty of $500.00 for each delivery that violates Section 2 (b). Such payment shall be in addition to any other charges paid to the PVSC by the CUSTOMER.

(c) Furthermore, in the event any Waste discharged by the CUSTOMER to the PVSC's system does not meet the requirements of Section 2 (b), or any other provision of these Terms and Conditions or provision or regulation of any governmental agency having jurisdiction, and causes unusual maintenance or operating costs to be paid by the PVSC, or causes the PVSC to incur fines or penalties for violation of any USEPA, NJDEP, or other governmental agency, for violation of any law, rule or permit, then in any such case, the CUSTOMER shall reimburse the PVSC in full for such additional costs incurred, or fines or penalties assessed.

The PVSC shall use reasonable diligence and care to provide waste treatment service at its wastewater treatment plant for the use of the CUSTOMER. The PVSC shall not be liable for any failure to provide the services which are the subject of these Terms and Conditions.

The PVSC shall not be responsible for any interruption or cessation of services due to the action of any governmental agency having jurisdiction over the PVSC.

Section 6. INDEMNIFICATION

The CUSTOMER agrees to indemnify and save the PVSC harmless from all damages and claims for damages, actual or alleged, suits, recoveries, judgments or executions (including costs, expenses and reasonable attorney's fees) which may be made, had, brought or recovered by reason of injury for and including death resulting therefrom, to any person whomsoever or damage to the property of any person whomsoever, arising out of the activities covered by these Terms and Conditions. These Terms and Conditions shall be made a part of the CUSTOMER's Comprehensive General Liability Policy, and the PVSC shall also be designated as an additional named insured on such policy.

Section 7. INSURANCE

The CUSTOMER shall at its own cost and expense take out and maintain and shall cause its subcontractors to obtain and maintain, all statutory insurance such as worker's compensation, bodily injury liability and property damage liability insurance and automobile and truck bodily injury liability and property damage insurance which shall be provided in not less than the following amounts:

(a)	Injury or death to one person	$1,000,000
(b)	Injury or death to more than one person or more than a single occurrence	$1,000,000
(c)	Property damage	$1,000,000
(d)	Property damage on account of all occurrences	$1,000,000

The CUSTOMER shall have the PVSC named as an additional named insured on its policy for the coverage's required, and a certificate of insurance evidencing the required insurance shall be filed by the CUSTOMER with the Executive Director of the PVSC.

Section 8. TESTING AND MONITORING

The CUSTOMER shall be responsible for waste sampling, testing, reporting or other requirement of the NJDEP and the USEPA and for the cost thereof, regarding monitoring for waste quality parameters including heavy metals and toxic organic chemicals; copies of any waste analysis reports sent to NJDEP and USEPA for the above parameters, shall be filed with the PVSC.

Section 9. SPILLAGE

Any spillage caused by the CUSTOMER, his hauler or his equipment while on PVSC property, shall be the CUSTOMER's responsibility to properly clean up at the CUSTOMER's expense. The clean up shall meet all Federal and State requirements and regulations, including supplying all documentation. The CUSTOMER and/or HAULER must maintain a spill response plan.

Section 10. GOVERNMENTAL REGULATIONS

The CUSTOMER specifically agrees that if the New Jersey Department of Environmental Protection (NJDEP), or any other governmental agency having jurisdiction over the PVSC or the subject matter of this Agreement, institutes a District Sludge Management Plan, or other plan of similar nature, which this Agreement unenforceable by its terms, then this Agreement shall terminate within sixty (60) days of implementation of the Plan. If the Plan renders any provision of this Agreement unenforceable, or requires changes and modifications in the Agreement which the PVSC is unwilling to accept, then the PVSC reserves the right to terminate this Agreement on sixty (60) days notice.

Section 11. RESERVATION OF RIGHTS

The CUSTOMER agrees to PVSC's reserving the right to decide all questions arising as to the proper rendering of services to CUSTOMER. PVSC shall also have the absolute right at its sole discretion to discontinue service to the CUSTOMER for any reason upon 120 days notice to the CUSTOMER.

The CUSTOMER by executing this document specifically reaffirms and ratifies all information representations and warrantees given PVSC whether orally, in other writings or herein. The CUSTOMER further acknowledges that such information and the undertakings agreed to by the CUSTOMER herein were given to induce PVSC to treat and dispose of the CUSTOMER's waste and that PVSC will rely on their truthfulness and accuracy.

In signing this document, the undersigh certifies that he has the authority to bind the CUSTOMER to the agreements contained herein, and if the CUSTOMER is a corporation its execution has been authorized by proper corporate resolution.

SK SERVICES (EAST) L.C.
Customer Company Name

Authorized Signature — Title: Vice President

I certify that the information given PVSC by the CUSTOMER is true and accurate. I am aware that if any information given PVSC in connection with this document is willfully false I am subject to legal penalty.

Signature — Date: 2/8/99

CLEAN VENTURES, INC.
Hauler's Company Name
(If not Customer)

Authorized Signature — Title

I certify that the information given PVSC by the HAULER is true and accurate. I am aware that if any information given PVSC in connection with this document is willfully false I am subject to legal penalty.

Signature — Date

SK SERVICES (EAST) L.C.
Generator's Company Name
If not Customer)

Authorized Signature — Title: Vice President

I certify that the information given PVSC by the GENERATOR is true and accurate. I am aware that if any information given PVSC in connection with this document is willfully false I am subject to legal penalty.

Signature — Date: 2/8/99

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

January 14, 1999

REPLY TO ATTENTION OF
Eastern Permits Section

SUBJECT: Department of the Army Permit Number 1998-16150

Mr. Gil Frank
Stratus Petroleum
9040 Roswell Road, Suite 380
Atlanta, GA 30350

Dear Mr. Frank:

We have completed our review of Application Number 1998-16150-J1.

Pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403), you are hereby authorized by the Secretary of the Army:

ACTIVITY: To dredge approximately 800 cubic yards of material (500 cubic yards of dredged material and 300 cubic yards of oversize/debris) to a depth of 25 feet below mean low water with two feet of allowable overdepth. Material shall be transported by barge to the Koppers Coke (Seaboard) Site for processing then beneficially reused on upland portions of that site.

WATERWAY: Passaic River

LOCATION: City of Newark, Essex County and Town of Kearny, Hudson County, New Jersey

The activity authorized herein must be completed within three years of the date of this permit. This authorization is subject to the enclosed conditions. Please find enclosed two forms to be used to submit to this office, as required, the dates of commencement and completion for the authorized activity.

The authorized activity must be performed in accordance with the enclosed plans. If any material changes in the location or plans of the subject work are found necessary, revised plans should be submitted to the District Engineer. These plans must receive the approval required by law before work begins.

If any questions should arise concerning this matter, please contact James W. Haggerty at (212) 264-3912.

Sincerely,

Joseph Gebode

"For and in behalf of"
William H. Pearce
Colonel, Corps of Engineers
District Engineer

Enclosures

PERMIT CONDITIONS:

NOTE: The term "you" and its derivatives, as used in this permit means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of engineers having jurisdiction over the permitted activity or appropriate official of that office acting under the authority of the commanding officer.

GENERAL CONDITIONS:

1. The time limit for completing the work authorized ends within three years of the date of this permit. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least four months before the date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party upon written notification to this office. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

A) Prior to the commencement of work authorized herein, the permittee shall notify the United States Coast Guard at (718) 354-4193 of the expected commencement and completion dates for the work and the hours of day during which work is to be undertaken.

B) Treated dredged material to be beneficially reused for remediating the Koppers Coke (Seaboard) Site must not contain contaminant concentrations greater than the New Jersey Non-residential, direct contact, soil cleanup guidelines (N.J.A.C. 7:26D).

Further Information:

1. Limits of authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

2. Limits to Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

3. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

4. Reevaluation of Permit Decision: This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of the permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 3 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

5. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278–0090

REPLY TO ATTENTION OF

CENAN-OP-RH

IMPORTANT

This letter must be completed and mailed to the Harbor Supervision & Compliance Section at the above address prior to commencement of any work authorized under the permit.

Permittee: Stratus Petroleum Permit No. 1998-16150

Date Permit Issued: January 14, 1999 Expiration Date: January 14, 2002

Waterway: Passaic River

City & State: Newark, New Jersey

Work will commence on or about:_____
Name, Address & Telephone Number of Contractor:

_____ _____
Signature of Permittee Date

Fold this form into thirds, with the bottom third facing outward. Tape it together and mail to the address below or **FAX to (212) 264-4260.**

Place Stamp Here

Department of the Army
New York District Corps of Engineers
Jacob K. Javits Federal Building
ATTN: CENAN-OP-RH
New York, New York 10278-0090

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278–0090

REPLY TO
ATTENTION OF
CENAN-OP-RH

IMPORTANT

This letter must be completed and mailed to the Harbor Supervision & Compliance Section at the above address following completion or cancellation of work authorized under the permit.

Permittee: Stratus Petroleum Permit No. 1998-16150

Date Permit Issued: January 14, 1999 Expiration Date: January 14, 2002

Waterway: Passaic River

City & State: Newark, New Jersey

Check and complete applicable item(s) listed below:

____ Work was completed on _____.
____ Work will not be performed on the project.
____ Deviation from work authorized in permit is explained below.
____ Other (explain) _____

_____

_____

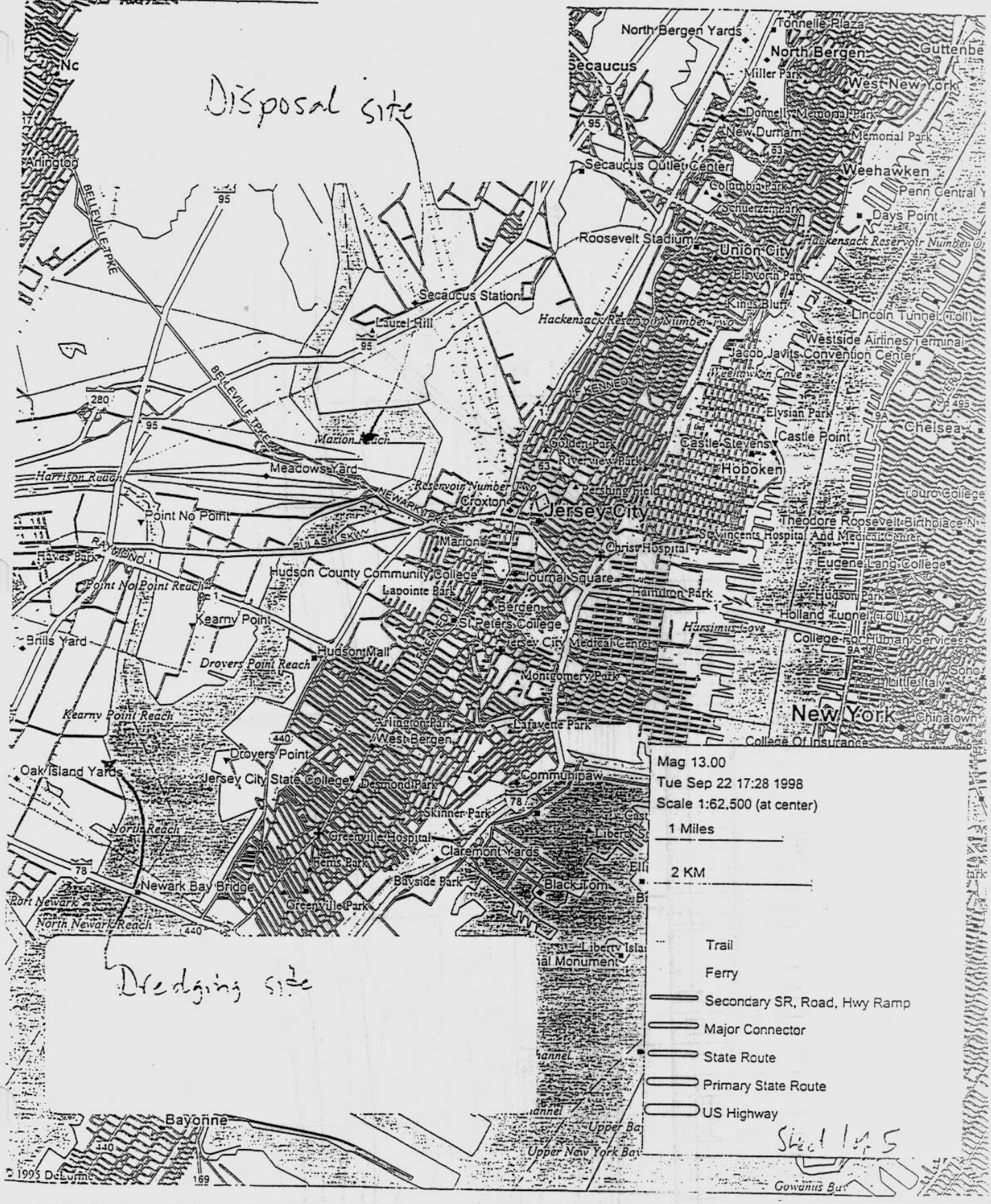
_____ _____
Signature of Permittee Date

Fold this form into thirds, with the bottom third facing outward. Tape it together and mail to the address below or FAX to (212) 264-4260.

Place Stamp
Here

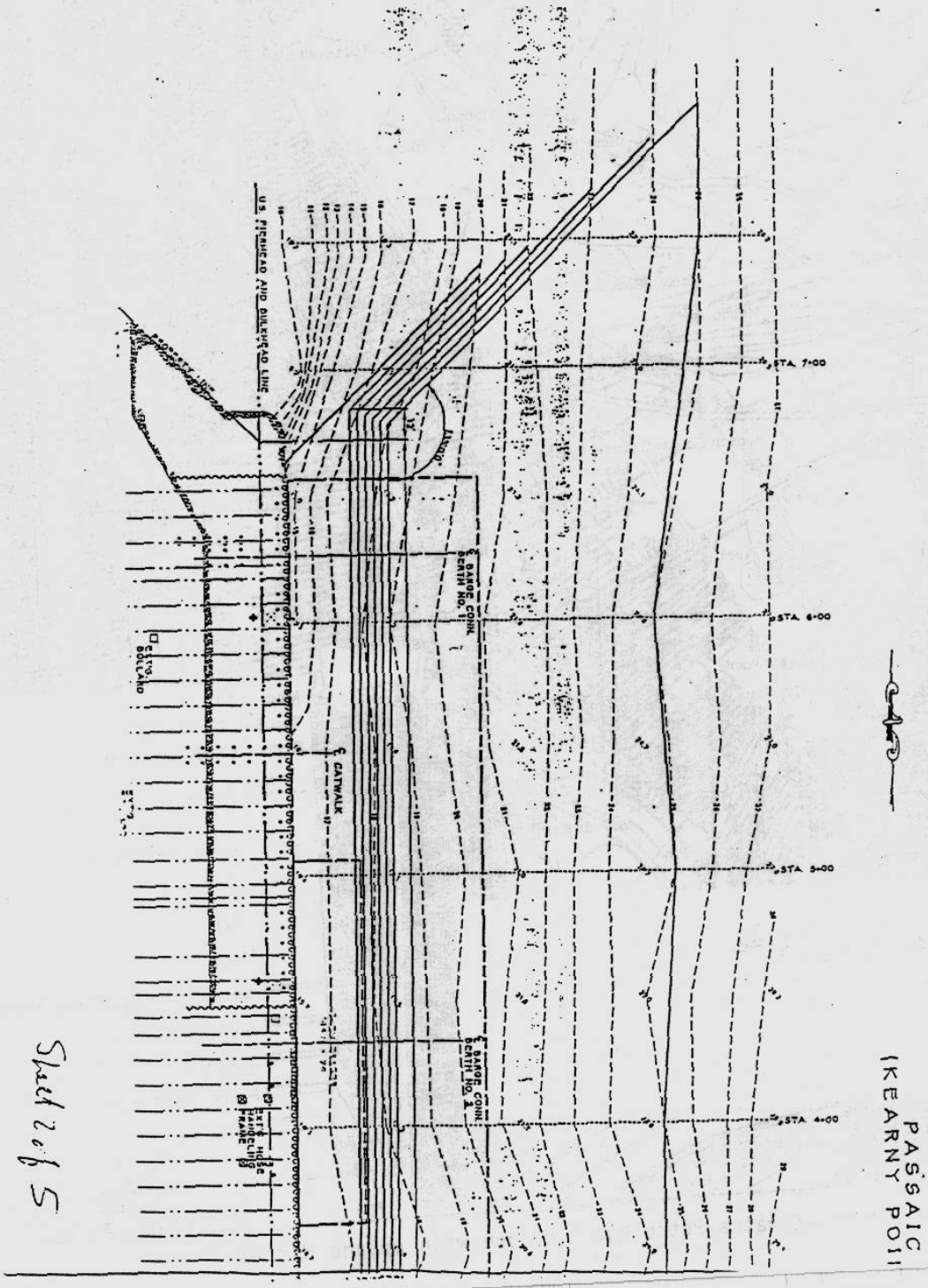
Department of the Army
New York District Corps of Engineers
Jacob K. Javits Federal Building
ATTN: CENAN-OP-RH
New York, New York 10278-0090

WRDA Sediment Decontamination Pilot Tes



145b (Passaic River —Stratus Petroleum - dredge with upland disposal)

1145b (Passaic River — Stratus Petroleum - dredge with upland disposal)



Sheet 2 of 5

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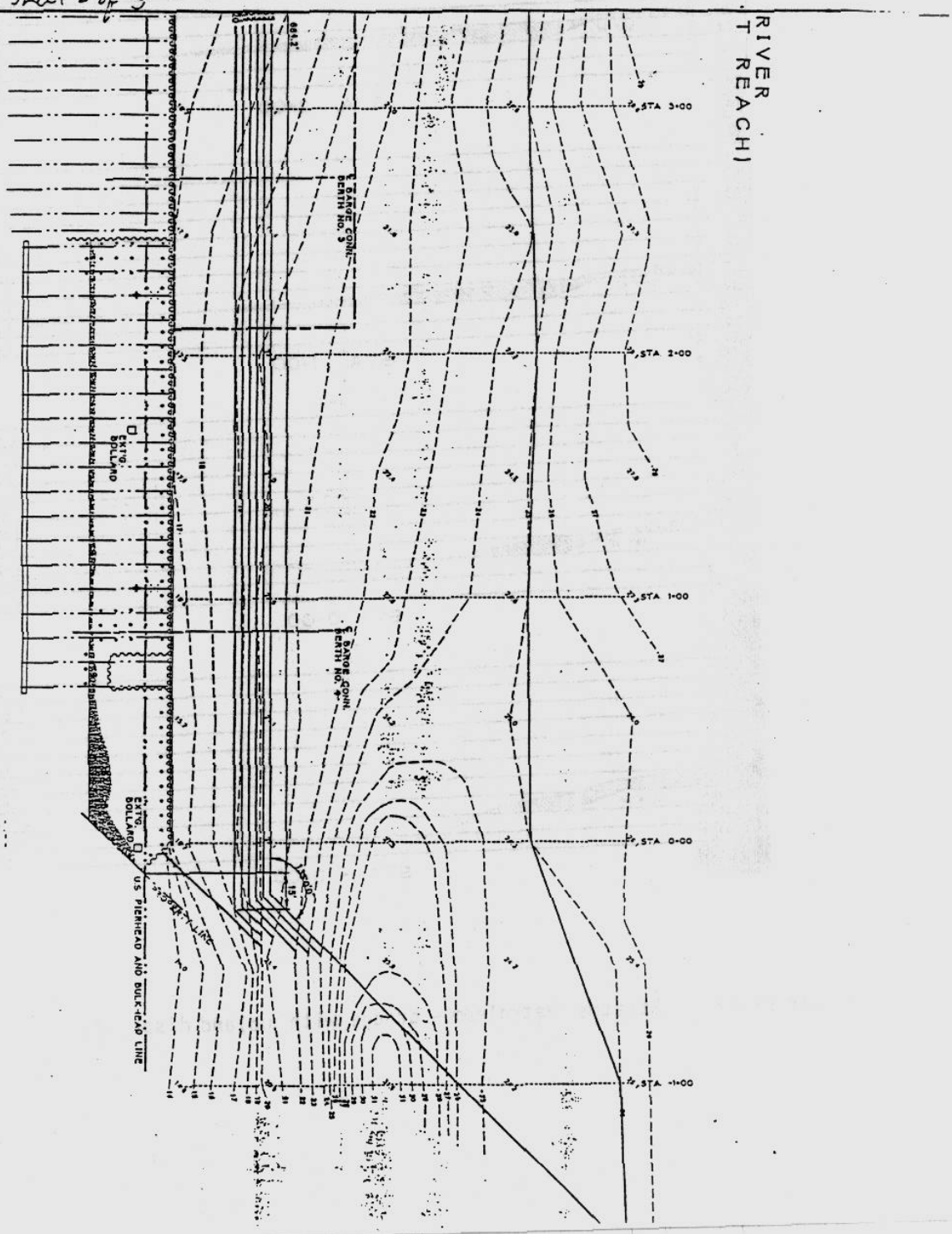
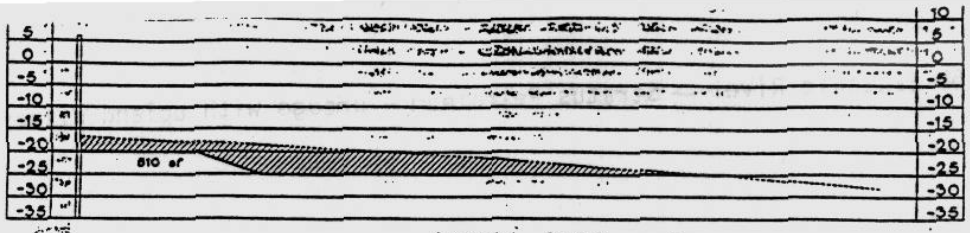
1145b (Passaic River — Stratus Petroleum - dredge with upland disposal)

Match line Sheet 2 of 5

Match line



Sheet 3 of 5



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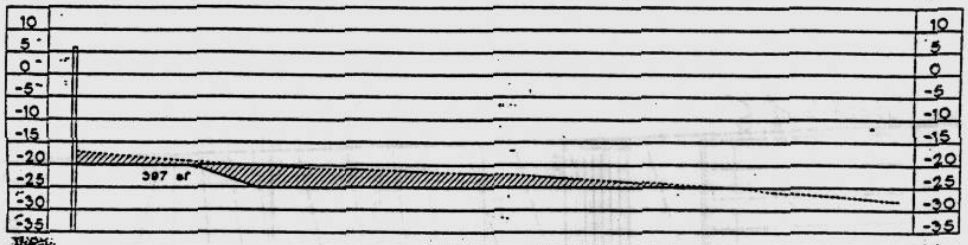

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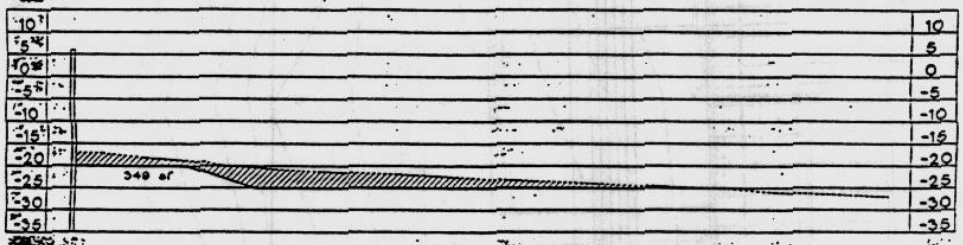

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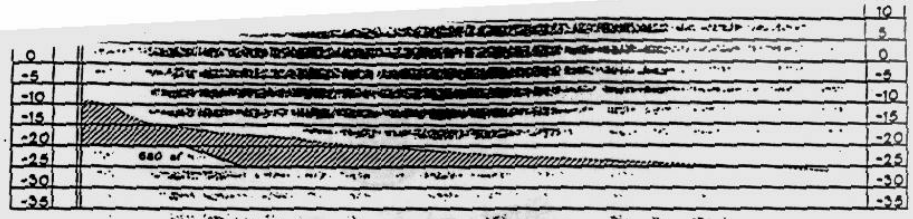
1145b (Passaic River Stratus Petroleum - dredge with upland disposal)

Sheet 4 of 5



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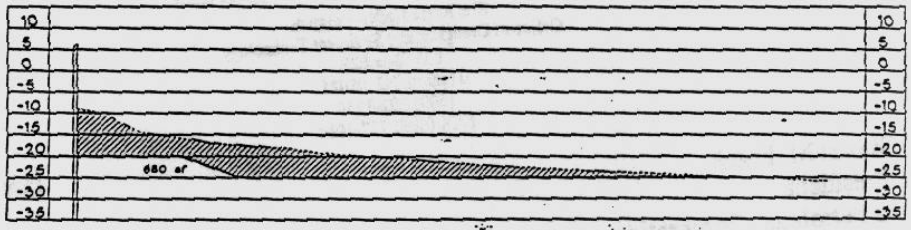

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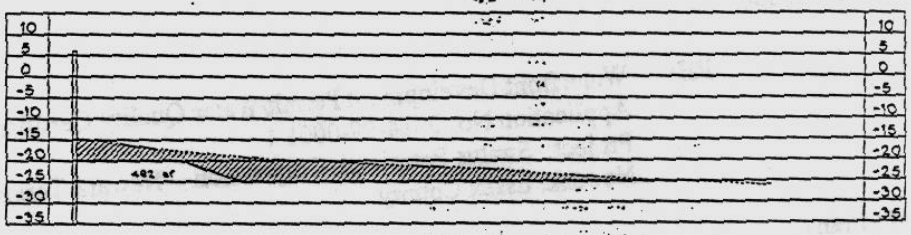

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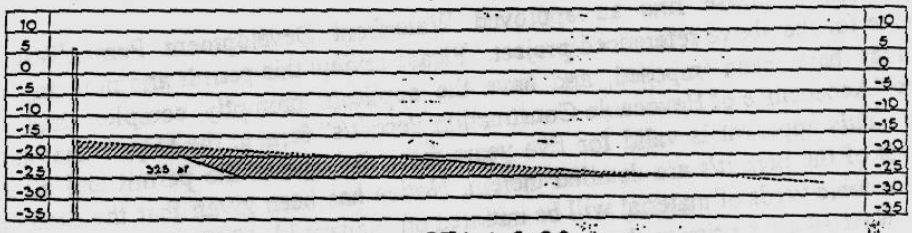

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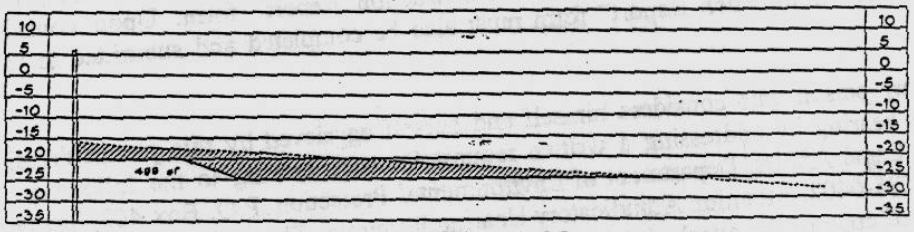

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145b (Passaic River — Stratus Petroleum - dredge with upland disposal)

Sheet 5 of 5

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection

Site Remediation Program
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625
(609) 292-1250
FAX (609) 777-1914

Robert C. Shinn, Jr.
Commissioner

January 13, 1999

Mr. Gilbert M. Frank
Vice President
Stratus Petroleum Corporation
9040 Roswell Road, Suite 380
Atlanta, GA 30350

RE: Waterfront Development Permit/Water Quality Certificate
Application No: 0714-99-0001.1
Project: Stratus Petroleum Corporation – Newark Terminal
Newark, Essex County

Dear Mr. Frank:

Enclosed, please find an approved Waterfront Development Permit/Water Quality Certificate for the above referenced project. Please review this permit and note any conditions which may have been imposed, and have the applicant promptly complete and return the enclosed "Acceptance of Revocable Construction Permit/s" form to the Department at the above address. This approval is valid for five years from the date of the permit and all terms and conditions of the permit/s are detailed therein. Notice has been given that the dredging of the initial 800 cubic yards of material will be initiated on January 14, 1998. The permittee shall give notice at least 14 days prior to the date of initiation of each dredging episode for the remaining 17,200 cubic yards using the enclosed "Construction Report" form. Upon completion of dredging, the "Completion Report" form must also be completed and submitted to the above address.

Any person who considers himself and herself aggrieved by this permit decision may request a hearing by addressing a written request for such hearing to the following address: Office of Legal Affairs, Department of Environmental Protection, P.O. Box 402, Trenton, New Jersey 08625-0402, Attention Adjudicatory Hearing Requests. This written request must include a completed copy of the attached Administrative Hearing Request Checklist and all information identified in Section III of that list.

In order to promote inter-governmental cooperation in the management of our natural resources, a copy of this decision shall be shared with appropriate local and federal agencies. Should you have any questions in this regard, please do not hesitate to contact Suzanne Dietrick at (609) 292-9203.

Sincerely,

Lawrence J. Baier

Lawrence J. Baier, Chief
Office of Dredging and Sediment Technology
Site Remediation Program

Enclosures

C: New York District Corps of Engineers
Bureau of Coastal and Land Use Enforcement –Trenton
Scott Douglas, NJ Maritime Resources

Eric Stern
USEPA – Region II
Contaminated Sediments Program Manager
290 Broadway, 24th Floor
New York, NY 10007-1866

Municipal Clerk– City of Newark
920 Broad Street, Room 304
Newark, NJ 07102

Mike Hornsby, Paulus, Sokolinski & Sartor
Via FAX: 732-271-0253

Gary Lipsius, Case Manager
NJDEP, Site Remediation Program

Robert Bratt, District Engineer
Hackensack Meadowlands District
1 DeKorte Park Plaza
Lyndhurst, New Jersey 07071

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

(See Issuing Division below)

PERMIT*

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No. 0714-99-0001.1	Application No. 0714-99-0001.1

Issuance Date JANUARY 13, 1999	Effective Date JANUARY 13, 1999	Expiration Date JANUARY 13, 2004

Name and Address of Applicant Stratus Petroleum Corporation 9040 Roswell Road, Suite 380 Atlanta, GA 30350	Name and Address of Owner Same As Applicant	Name and Address of Operator
Location of Activity/Facility *(Street Address)* Stratus Newark Terminal 678 Doremus Avenue Newark, Essex County Lot: 30, 30A Block: 5066	Issuing Division Office of Dredging and Sediment Technology	Statute(s) NJSA 58:10A NJSA 12:5-3

Type of Permit Waterfront Development Permit/ Water Quality Certificate/Acceptable Use Determination	Maximum Approved Capacity, if applicable

This permit grants permission to:

Perform maintenance dredging of approximately 18,000 cubic yards of material to restore the berthing area to a depth of 25 feet below MLW (23 feet +2 feet overdredge). The berthing area was last dredged in the 1980's.

Of this amount of material, 800 cubic yards of material is to be removed by the Army Corp of Engineers using a 1.5 cubic yard closed clamshell bucket with placement in a barge for transport, and subsequent treatment of the dredged material at the BioGenesis, Inc. facility located on the Koppers Seaboard site in Kearny, NJ. BioGenesis is a sediment washing process that utilizes biodegradable surfactants, mixtures and water to treat soils, sediments and sludges contaminated with inorganic and organic constituents. The treated material will be placed in roll of containers for further analyses prior to transport to the final use location. The material is intended to be used as cover material in the remediation of the Koppers Seaboard Site upon approval from the NJDEP, and the Hudson County Improvement Authority (HCIA). The dredging of the initial 800 cubic yards of material is part of a decontamination demonstration project being initiated by the USEPA Region II Contaminated Sediment Program and the New Jersey Office of Maritime Resources.

The remaining 17,200 cubic yards of material is to be utilized in demonstration projects of sediment decontamination technology approved by the Dredging Project Facilitation Task Force at its December 22, 1998 meeting, with oversight by the State of New Jersey, Department of Commerce and Economic Development, Maritime Resources.

Prepared By: Suzanne Dietrick 1/13/98
Suzanne U. Dietrick Date

(See Page 5 of 5 pages for Chief's signature.)

1/13/99

Revised Date	Approved by the Department of Environmental Protection Name (Print or Type) _____ Title _____ Signature _____ Date _____

**The word permit means "approval, certification, registration, etc."*

(General Conditions are on Page Two)

This permit is subject to the following general conditions:

1. This permit is revocable, or subject to modification or change at any time, pursuant to the applicable regulations, when in the judgement of the Department of Environmental Protection of the State of New Jersey such revocation, modification or change shall be necessary.

2. The issuance of the permit shall not be deemed to affect in any way action by the Department of Environmental Protection of the State of New Jersey on any future application.

3. The works, facilities, and/or activities shown by plans and/or other engineering data, which are this day approved, subject to the conditions herewith established, shall be constructed and/or executed in conformity with such plans and/or engineering data and the said conditions.

4. No change in plans or specifications shall be made except with the prior written permission of the Department of Environmental Protection of the State of New Jersey.

5. The granting of this permit shall not be construed to in any was affect the title or ownership of property, and shall not make the Department of Environmental Protection or the State a party in any suit or question of ownership.

6. This permit does not waive the requirement to obtain Federal, State or local government consents when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained.

7. A copy of this permit shall be kept at the work site, and shall be exhibited upon request of any person.

8. In cases of conflict, the conditions of this permit shall supersede the plans and/or engineering data.

The project is shown on plans consisting of five sheets entitled "Marine Terminal Renovation for Stratus Petroleum, Newark, New Jersey" dated December, 1998 prepared by Richard Hallman of Hussey, Gay, Bell & DeYoung Consulting Engineers.

This permit is authorized under, and in compliance with, the Rules on Coastal Zone Management (N.J.A.C. 7:7E) governing; Finfish Migratory Pathways (7:7E-3.5) Maintenance Dredging (7:7E-4.2(f)) and Dredged Material Disposal on Land (7:7E-7.12).

This permit is approved subject to, and in accordance with, all applicable Tidelands Licenses issued to TOC Terminals, Inc. (File No. 6507-C). Issuance of this permit does not in any way relinquish the State's ownership interest in the property, if any exists.

This permit is issued subject to and provided that the following conditions can be met to the satisfaction of the Office of Dredging and Sediment Technology. All conditions must be met prior to construction unless otherwise specified. Compliance with Administrative conditions shall be determined once copies of all specified permits, certifications, plans, agreements, etc. have been received, not less than 30 days prior to construction, and approved by the Office of Dredging and Sediment Technology. All Physical Conditions are subject to on-site compliance inspection by the Bureau of Coastal and Land Use Enforcement. As per N.J.A.C. 7:7-1.4, you must notify the Bureau of Coastal and Land Use Enforcement, (P.O. Box 422, 401 East State Street, Floor 4, Trenton, NJ 08625-0422), in writing at least 3 days prior to commencement of construction or site preparation.

This permit shall be RECORDED in the office of the County Clerk (the REGISTRAR OF DEEDS AND MORTGAGES in the applicable counties) in the county wherein the lands included in the permit are located within ten (10) days after the receipt of the permit by the applicant and verified notice shall be forwarded to the Land Use Regulation Program immediately thereafter.

This permit is NOT VALID until the permit acceptance form has been signed by the applicant, accepting and agreeing to adhere to all permit conditions, and returned to the Office of Dredging and Sediment Technology, 6th floor Assistant Commissioner's Suite, P.O. Box 028, Trenton, New Jersey 08625.

Administrative Conditions:

1. The permittee shall allow an authorized representative of the Department the right to inspect construction pursuant to N.J.A.C. 7:7-1.5.

2. The permittee shall obtain all appropriate local, state, and federal approvals.

3. For dredging other than the 800 cubic yards that received a Letter of Permission dated December 31, 1998, the permittee shall obtain New York District Army Corps of Engineers authorization for this project, prior to initiating dredging.

4. The permittee shall submit original plans that are signed and sealed by a professional engineer.

5. Prior to dredging material other than the initial 800 cubic yards approved to be decontaminated at the BioGenesis facility, the permittee shall request and receive a modification to the Acceptable Use Determination which is appended to, and part of this Waterfront Development Permit.

Physical Conditions

1. Dredging is prohibited from April 1st through May 31st to protect anadromous finfish spawning season.

2. If a discharge of decant water is necessary from this dredging project prior to the off-loading the material at a particular decontamination facility, that water will be transported back to the dredging site. No discharge of decant water to surface waters of the state is permitted at any processing facility unless a NJPDES/DSW permit is obtained by the facility. Any discharge of decant water at the dredging site shall meet a Total Suspended Solids (TSS) action level of 30 mg/l. No discharge from the dewatering barge is permitted until the results of the analysis confirm that the TSS action level will be met. Additional decant shall not be added to the dewatering barge between the time of sampling for TSS and the termination of the discharge for which the analysis has been performed. The permittee shall measure the TSS levels during the actual discharge to the Passaic River to determine possible exceedances of the TSS action level. If at any time during the discharge, the action level is exceeded, the permittee shall immediately cease the discharge of return water, allow for additional settling in the barge, and then continue the discharge. All decant water shall be discharged to minimize the resuspension of bottom sediments in the receiving water.

3. Efforts shall be made to maximize the size of the "bite" of the closed clamshell bucket.

4. The permittee shall maintain a "No barge overflow" during the entire dredging project.

Acceptable Use Determination

This Acceptable Use Determination authorizes the treatment of material dredged pursuant to Waterfront Development Permit 0714-99-0001.1 at any of the decontamination technology demonstration projects approved by the Dredging Project Facilitation Task Force at its December 22, 1998 meeting, subject to the following conditions:

Initial 800 cubic yards for BioGenesis

1. An initial 800 cubic yards is to be dredged under Waterfront Development Permit 0714-99-0001.1 and processed through the BioGenesis facility. Any material processed through the BioGenesis facility shall comply with all conditions specified in the Stream Encroachment Permit (No. 0907-91-0006.12) issued to the facility on December 18, 1998.

2. No discharge of decant water to surface waters of the State shall be permitted at the Koppers / Seaboard site. Any excess water shall be transported back to the dredging site and discharged in compliance with Physical Condition No. 2 of Waterfront Development Permit 0714-99-0001.1.

3. All oversized material screened at the Koppers / Seaboard site, which is not to be decontaminated through the BioGenesis facility shall be properly disposed of at licensed solid waste facility. As an alternate, oversized native material only, (i.e. rock or clay), may be placed on the Koppers / Seaboard site if it has been tested in accordance with the protocol established for the site, and the material has been approved for placement by the Hudson County Improvement Authority and the Department.

4. All material taken to the Koppers / Seaboard site for processing through the BioGenesis facility shall be sequestered from other material approved for placement at the site. The BioGenesis

material shall be transported from the dock at the Koppers / Seaboard site to the BioGenesis facility via an enclosed tank truck or via a lined or sealed truck. Every precaution shall be made to avoid accidental release of this material at the Koppers / Seaboard site.

5. After the initial 800 cubic yards of material is processed at the Biogenesis facility, that material shall be temporary stored in roll off containers. The permittee shall collect three discrete samples of the treated material within the roll off containers. The three discrete samples shall be composited into one sample and analyzed in accordance with the Analytical Testing Requirements for the Placement of Processed Dredged Material at the Koppers Seaboard Site, Kearny, NJ (January 22,1998, attached). The results of these analyses shall be submitted to the NJDEP and HCIA for approval for placement of the material at the Koppers Seaboard site. Once the material has been approved by HCIA and NJDEP for placement at the Koppers / Seaboard site, the material may be placed in accordance with the approved Remedial Action Workplan.

6. If the initial 800 cubic yards of material is found unacceptable for placement at the Koppers Seaboard site, then the permittee shall submit a contingency plan, to the NJDEP Office of Dredging and Sediment Technology, for the use or disposal of this material. No material may be transported from the Biogenesis facility without written approval from the NJDEP of the alternate use or disposal option.

Balance of Material (17,200 cubic yards)

7. Prior to dredging any of the remaining material, the permittee shall submit a request for a modification of this Acceptable Use Determination to the Department and shall receive the Department's approval of that modification. The request shall include, the amount of material to be dredged, the decontamination and/or processing facility through which the material will be processed and the proposed end use of the decontaminated dredged material.

8. All processed dredged material from this project shall be analyzed prior to transport to the final use or disposal location for that material. Analyses may include, but is not limited to, bulk sediment chemistry, and analysis using the Multiple Extraction Procedure (EPA method 1320). Required analyses will be dependent on the particular dredged material processing facility and/or final use or disposal option.

9. All processed dredged material from the project that is to be utilized at a use location for structural fill/cover material shall be placed in a manner consistent with all approvals governing that site.

Lawrence J. Bain

Lawrence J. Bain, Chief
Office of Dredging and Sediment Technology

January 13, 1999
Date

ANALYTICAL TESTING REQUIREMENTS FOR THE PLACEMENT OF PROCESSED DREDGED MATERIAL AT THE KOPPERS SEABOARD SITE, KEARNY, NJ

January 22, 1998

The specific analytes which must be tested for are listed in the tables in Appendices A and B of the NJDEP technical manual entitled "The Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters" (October 1997). The compounds to be tested for include PCB arochlors and dioxin/furan congeners.

Laboratories used must be certified by the Department for the particular analytical method to be performed. Please verify current certification status with the Office of Quality Assurance (Phone: 609-292-3950).

Since the processed dredged material to be used as structural fill at the Koppers Seaboard site will be treated with other materials which will alter its physical and chemical composition, additional tests must be performed on the end product. The required tests are as follows:

PROTOCOL FOR THE TESTING OF PROCESSED DREDGED MATERIAL FOR USE AS STRUCTURAL FILL

Bulk sediment chemistry, grain size, total organic carbon, and percent moisture analyses must be performed on each composite sediment sample. Any water which separates from the dredged material during transport/storage (i.e. porewater) must be remixed with the solid components of the dredged material prior to forming the composite samples; this porewater must not be decanted from the dredged material.

For each composite sediment sample, a sample of the processed dredged material product will be created by combining measured amounts of Portland cement with a preweighed sample of the sediments to be dredged. The mixing time will, to the greatest extent possible, replicate the residence time in the blending facility/operation to be used in the actual full-scale project. The ratio of Portland cement to composite sediment sample, by weight, will be recorded. The dredged material product to be tested will be formed using the "recipe" (i.e. proportions of dredged material and Portland cement) which replicates, to the greatest extent possible, the actual processed dredged material product which will be placed as structural fill on the Koppers Seaboard site. The dredged material product samples will be pulverized, and each sample subjected to bulk chemical analysis.

The dredged material product samples will be pulverized, and each sample subjected to a modified Multiple Extraction Procedure (EPA Method 1320) testing, as follows:

Procedure

1. Prepare a synthetic acid rain extraction fluid of pH 4.2 water using a 60%/40% blend of sulfuric acid, to be used as the leachate fluid.

2. Measure an aliquot of 100 grams of each dredged material product sample and place into separate glass TCLP vessels. Measure a 25 gram aliquot of each dredged material product sample and place in separate zero-headspace extractors (ZHE) for analysis of volatile organics. Measure an aliquot of the synthetic acid rain extraction fluid equal to 20 times the weight of each of the solid samples.

3. Combine the solid phase sample and the synthetic acid rain fluid in the TCLP extractor and begin agitation. Record the pH within 5-10 minutes after agitation has started.

4. Agitate the mixture for 24 hours, maintaining the temperature at 20-40 C (68-104 F). Record the pH at the end of the 24-hour extraction period. (All pH measurements will be taken on the bottle extraction only)

5. Employ the extraction fluid separation procedure as described in EPA Method 1311 (TCLP).

6. Analyze the extract for the constituents of concern identified in the Department's October 1997 technical manual. Dioxins/furans shall only be analyzed in the first and seventh extraction steps.

7. Repeat steps 3 through 6, six additional times. Do not allow the solid sample to dry before weighing.

8. Report the initial and final pH of each extraction and the concentration of each listed constituent of concern in each extract.

A final report, including the results of the sediment and dredged material product testing, will be presented to the Department in a series of nine (9) summary data tables:

- sediment bulk chemistry
- dredged material product bulk chemistry
- dredged material product leachate extraction steps.

U.S. Department of Transportation
United States Coast Guard

Commander
Activities New York

212 Coast Guard Drive
Staten Island, NY 10305
Staff Symbol: (wob)
Phone: (718) 354-4195
FAX: (718) 354-4190

16670

JAN - 7 1999

U. S. Army Corps of Engineers
New York District
Jacob K. Javitz Federal Bldg
New York, NY 10278-0090
Attn: Regulatory Branch

DREDGE / PASSAIC RIVER / CITY OF NEWARK / ESSEX COUNTY / TOWNSHIP OF KEARNY / HUDSON COUNTY, NEW JERSEY / 98-16150-J1

I have reviewed the public notice listed above. I request that this office be notified when start and completion dates for the project are known, as well as the hours during which work will be done i.e., daylight or 24 hours. I ask this to ensure coordination with vessel traffic and marine events.

I also request that any permit you issue require the permittee to have the information posted in the Local Notice to Mariners. This information may be faxed to (617) 223-8073 or mailed to:

Commander (oan)
First Coast Guard District
408 Atlantic Avenue
Boston, MA 02210-2209
Attn: Local Notice to Mariners

If you have any questions or comments regarding this matter, please contact me at (718) 354-4193.

Sincerely,

J.P. Lopez
Lieutenant, U.S. Coast Guard
By direction of the
Captain of the Port, New York

To: Eric Stern

JAN 11 1999

U.S. Fish and Wildlife Service
New Jersey Field Office
927 N. Main Street (Bldg. D-1)
Pleasantville, NJ 08232
Phone: (609) 646-9310
Fax: (609) 646-0352

In reply refer to: PL-NY-99/01 Date: January 11, 1999

To: Joseph J. Seebode, Chief
Regulatory Branch, New York District
U.S. Army Corps of Engineers
New York, New York 10278-0090
Fax #: (212) 264-4260

ATTN: James W. Haggerty, Chief, Eastern Permits Section

Application No.: 1998-16150-J1

Applicant: Stratus Petroleum, Atlanta, GA

Location: City of Newark, Essex Co. and Township of Kearny, Hudson Co., NJ

Dear Mr. Seebode:

The U.S. Fish and Wildlife Service (Service) has reviewed the subject application and is providing the following comments on the proposed activity pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*) and the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*):

___ The Service requests an additional 10 days to review and comment.

___ The Service has no objection to issuance of a letter of permission. No further consultation pursuant to Section 7 of the ESA is required by the Service on the proposed action.

___ The Service concurs with the comments and recommendations of the National Marine Fisheries Service (NMFS) and has no objection to issuance of a letter of permission, provided that any special conditions recommended by the NMFS are incorporated. No further consultation pursuant to Section 7 of the ESA is required by the Service on the proposed action.

X The Service has no objection to issuance of a letter of permission for the proposed project, provided that the attached special conditions are incorporated (see Attachment 1). No further consultation pursuant to Section 7 of the ESA is required by the Service on the proposed action.

Reviewing Biologist: Veronica W. Varela

Authorizing Supervisor: [illegible]

Eric Stern
see p.2
- problem?
Jim H

LOP-NY.FAX rev. 1/08/98

Attachment 1

Application No. 1998-16150-J1

Conditions

1. Treated dredged material to be used as "clean fill" for remediating the Koppers Coke (Seaboard) Site must not contain contaminant concentrations greater than the New Jersey Non-residential, direct contact, soil cleanup guidelines (N.J.A.C. 7:26D).

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection

Robert C. Shinn, Jr.
Commissioner

Site Remediation Program
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625
(609) 292-1250
FAX (609) 777-1914

January 13, 1999

Mr. Gilbert M. Frank
Vice President
Stratus Petroleum Corporation
9040 Roswell Road, Suite 380
Atlanta, GA 30350

RE: Waterfront Development Permit/Water Quality Certificate
Application No: 0714-99-0001.1
Project: Stratus Petroleum Corporation – Newark Terminal
Newark, Essex County

Dear Mr. Frank:

Enclosed, please find an approved Waterfront Development Permit/Water Quality Certificate for the above referenced project. Please review this permit and note any conditions which may have been imposed, and have the applicant promptly complete and return the enclosed "Acceptance of Revocable Construction Permit/s" form to the Department at the above address. This approval is valid for five years from the date of the permit and all terms and conditions of the permit/s are detailed therein. Notice has been given that the dredging of the initial 800 cubic yards of material will be initiated on January 14, 1998. The permittee shall give notice at least 14 days prior to the date of initiation of each dredging episode for the remaining 17,200 cubic yards using the enclosed "Construction Report" form. Upon completion of dredging, the "Completion Report" form must also be completed and submitted to the above address.

Any person who considers himself and herself aggrieved by this permit decision may request a hearing by addressing a written request for such hearing to the following address: Office of Legal Affairs, Department of Environmental Protection, P.O. Box 402, Trenton, New Jersey 08625-0402, Attention Adjudicatory Hearing Requests. This written request must include a completed copy of the attached Administrative Hearing Request Checklist and all information identified in Section III of that list.

In order to promote inter-governmental cooperation in the management of our natural resources, a copy of this decision shall be shared with appropriate local and federal agencies. Should you have any questions in this regard, please do not hesitate to contact Suzanne Dietrick at (609) 292-9203.

Sincerely,

Lawrence J. Baier

Lawrence J. Baier, Chief
Office of Dredging and Sediment Technology
Site Remediation Program

Enclosures

C: New York District Corps of Engineers
Bureau of Coastal and Land Use Enforcement –Trenton
Scott Douglas, NJ Maritime Resources

Eric Stern
USEPA – Region II
Contaminated Sediments Program Manager
290 Broadway, 24th Floor
New York, NY 10007-1866

Municipal Clerk– City of Newark
920 Broad Street, Room 304
Newark, NJ 07102

Mike Hornsby, Paulus, Sokolinski & Sartor
Via FAX: 732-271-0253

Gary Lipsius, Case Manager
NJDEP, Site Remediation Program

Robert Bratt, District Engineer
Hackensack Meadowlands District
1 DeKorte Park Plaza
Lyndhurst, New Jersey 07071

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

(See Issuing Division below)

PERMIT*

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No. 0714-99-0001.1	Application No. 0714-99-0001.1

Issuance Date JANUARY 13, 1999	Effective Date JANUARY 13, 1999	Expiration Date JANUARY 13, 2004

Name and Address of Applicant Stratus Petroleum Corporation 9040 Roswell Road, Suite 380 Atlanta, GA 30350	Name and Address of Owner Same As Applicant	Name and Address of Operator
Location of Activity/Facility *(Street Address)* Stratus Newark Terminal 678 Doremus Avenue Newark, Essex County Lot: 30, 30A Block: 5066	Issuing Division Office of Dredging and Sediment Technology	Statute(s) NJSA 58:10A NJSA 12:5-3

Type of Permit Waterfront Development Permit/ Water Quality Certificate/Acceptable Use Determination	Maximum Approved Capacity, if applicable

This permit grants permission to:

Perform maintenance dredging of approximately 18,000 cubic yards of material to restore the berthing area to a depth of 25 feet below MLW (23 feet +2 feet overdredge). The berthing area was last dredged in the 1980's.

Of this amount of material, 800 cubic yards of material is to be removed by the Army Corp of Engineers using a 1.5 cubic yard closed clamshell bucket with placement in a barge for transport, and subsequent treatment of the dredged material at the BioGenesis, Inc. facility located on the Koppers Seaboard site in Kearny, NJ. BioGenesis is a sediment washing process that utilizes biodegradable surfactants, mixtures and water to treat soils, sediments and sludges contaminated with inorganic and organic constituents. The treated material will be placed in roll of containers for further analyses prior to transport to the final use location. The material is intended to be used as cover material in the remediation of the Koppers Seaboard Site upon approval from the NJDEP, and the Hudson County Improvement Authority (HCIA). The dredging of the initial 800 cubic yards of material is part of a decontamination demonstration project being initiated by the USEPA Region II Contaminated Sediment Program and the New Jersey Office of Maritime Resources.

The remaining 17,200 cubic yards of material is to be utilized in demonstration projects of sediment decontamination technology approved by the Dredging Project Facilitation Task Force at its December 22, 1998 meeting, with oversight by the State of New Jersey, Department of Commerce and Economic Development, Maritime Resources.

Prepared By: Suzanne Dietrick 1/13/98
Suzanne U. Dietrick Date

(See Page 5 of 5 pages for Chief's signature.)

1/13/99

Revised Date	Approved by the Department of Environmental Protection Name (Print or Type) _____ Title _____ Signature _____ Date _____

*The word permit means "approval, certification, registration, etc."

(General Conditions are on Page Two)

This permit is subject to the following general conditions:

1. This permit is revocable, or subject to modification or change at any time, pursuant to the applicable regulations, when in the judgement of the Department of Environmental Protection of the State of New Jersey such revocation, modification or change shall be necessary.

2. The issuance of the permit shall not be deemed to affect in any way action by the Department of Environmental Protection of the State of New Jersey on any future application.

3. The works, facilities, and/or activities shown by plans and/or other engineering data, which are this day approved, subject to the conditions herewith established, shall be constructed and/or executed in conformity with such plans and/or engineering data and the said conditions.

4. No change in plans or specifications shall be made except with the prior written permission of the Department of Environmental Protection of the State of New Jersey.

5. The granting of this permit shall not be construed to in any was affect the title or ownership of property, and shall not make the Department of Environmental Protection or the State a party in any suit or question of ownership.

6. This permit does not waive the requirement to obtain Federal, State or local government consents when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained.

7. A copy of this permit shall be kept at the work site, and shall be exhibited upon request of any person.

8. In cases of conflict, the conditions of this permit shall supersede the plans and/or engineering data.

The project is shown on plans consisting of five sheets entitled "Marine Terminal Renovation for Stratus Petroleum, Newark, New Jersey" dated December, 1998 prepared by Richard Hallman of Hussey, Gay, Bell & DeYoung Consulting Engineers.

This permit is authorized under, and in compliance with, the Rules on Coastal Zone Management (N.J.A.C. 7:7E) governing; Finfish Migratory Pathways (7:7E-3.5) Maintenance Dredging (7:7E-4.2(f)) and Dredged Material Disposal on Land (7:7E-7.12).

This permit is approved subject to, and in accordance with, all applicable Tidelands Licenses issued to TOC Terminals, Inc. (File No. 6507-C). Issuance of this permit does not in any way relinquish the State's ownership interest in the property, if any exists.

This permit is issued subject to and provided that the following conditions can be met to the satisfaction of the Office of Dredging and Sediment Technology. All conditions must be met prior to construction unless otherwise specified. Compliance with Administrative conditions shall be determined once copies of all specified permits, certifications, plans, agreements, etc. have been received, not less than 30 days prior to construction, and approved by the Office of Dredging and Sediment Technology. All Physical Conditions are subject to on-site compliance inspection by the Bureau of Coastal and Land Use Enforcement. As per N.J.A.C. 7:7-1.4, you must notify the Bureau of Coastal and Land Use Enforcement, (P.O. Box 422, 401 East State Street, Floor 4, Trenton, NJ 08625-0422), in writing at least 3 days prior to commencement of construction or site preparation.

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2. The permittee shall obtain all appropriate local, state, and federal approvals.

3. For dredging other than the 800 cubic yards that received a Letter of Permission dated December 31, 1998, the permittee shall obtain New York District Army Corps of Engineers authorization for this project, prior to initiating dredging.

4. The permittee shall submit original plans that are signed and sealed by a professional engineer.

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3. Efforts shall be made to maximize the size of the "bite" of the closed clamshell bucket.

4. The permittee shall maintain a "No barge overflow" during the entire dredging project.

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3. All oversized material screened at the Koppers / Seaboard site, which is not to be decontaminated through the BioGenesis facility shall be properly disposed of at licensed solid waste facility. As an alternate, oversized native material only, (i.e. rock or clay), may be placed on the Koppers / Seaboard site if it has been tested in accordance with the protocol established for the site, and the material has been approved for placement by the Hudson County Improvement Authority and the Department.

4. All material taken to the Koppers / Seaboard site for processing through the BioGenesis facility shall be sequestered from other material approved for placement at the site. The BioGenesis

material shall be transported from the dock at the Koppers / Seaboard site to the BioGenesis facility via an enclosed tank truck or via a lined or sealed truck. Every precaution shall be made to avoid accidental release of this material at the Koppers / Seaboard site.

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6. If the initial 800 cubic yards of material is found unacceptable for placement at the Koppers Seaboard site, then the permittee shall submit a contingency plan, to the NJDEP Office of Dredging and Sediment Technology, for the use or disposal of this material. No material may be transported from the Biogenesis facility without written approval from the NJDEP of the alternate use or disposal option.

Balance of Material (17,200 cubic yards)

7. Prior to dredging any of the remaining material, the permittee shall submit a request for a modification of this Acceptable Use Determination to the Department and shall receive the Department's approval of that modification. The request shall include, the amount of material to be dredged, the decontamination and/or processing facility through which the material will be processed and the proposed end use of the decontaminated dredged material.

8. All processed dredged material from this project shall be analyzed prior to transport to the final use or disposal location for that material. Analyses may include, but is not limited to, bulk sediment chemistry, and analysis using the Multiple Extraction Procedure (EPA method 1320). Required analyses will be dependent on the particular dredged material processing facility and/or final use or disposal option.

9. All processed dredged material from the project that is to be utilized at a use location for structural fill/cover material shall be placed in a manner consistent with all approvals governing that site.

Lawrence J. Baier, Chief
Office of Dredging and Sediment Technology

January 13, 1999
Date

ANALYTICAL TESTING REQUIREMENTS FOR THE PLACEMENT OF PROCESSED DREDGED MATERIAL AT THE KOPPERS SEABOARD SITE, KEARNY, NJ

January 22, 1998

The specific analytes which must be tested for are listed in the tables in Appendices A and B of the NJDEP technical manual entitled "The Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters" (October 1997). The compounds to be tested for include PCB arochlors and dioxin/furan congeners.

Laboratories used must be certified by the Department for the particular analytical method to be performed. Please verify current certification status with the Office of Quality Assurance (Phone: 609-292-3950).

Since the processed dredged material to be used as structural fill at the Koppers Seaboard site will be treated with other materials which will alter its physical and chemical composition, additional tests must be performed on the end product. The required tests are as follows:

PROTOCOL FOR THE TESTING OF PROCESSED DREDGED MATERIAL FOR USE AS STRUCTURAL FILL

Bulk sediment chemistry, grain size, total organic carbon, and percent moisture analyses must be performed on each composite sediment sample. Any water which separates from the dredged material during transport/storage (i.e. porewater) must be remixed with the solid components of the dredged material prior to forming the composite samples; this porewater must not be decanted from the dredged material.

For each composite sediment sample, a sample of the processed dredged material product will be created by combining measured amounts of Portland cement with a preweighed sample of the sediments to be dredged. The mixing time will, to the greatest extent possible, replicate the residence time in the blending facility/operation to be used in the actual full-scale project. The ratio of Portland cement to composite sediment sample, by weight, will be recorded. The dredged material product to be tested will be formed using the "recipe" (i.e. proportions of dredged material and Portland cement) which replicates, to the greatest extent possible, the actual processed dredged material product which will be placed as structural fill on the Koppers Seaboard site. The dredged material product samples will be pulverized, and each sample subjected to bulk chemical analysis.

The dredged material product samples will be pulverized, and each sample subjected to a modified Multiple Extraction Procedure (EPA Method 1320) testing, as follows:

Procedure

1. Prepare a synthetic acid rain extraction fluid of pH 4.2 water using a 60%/40% blend of sulfuric acid, to be used as the leachate fluid.

2. Measure an aliquot of 100 grams of each dredged material product sample and place into separate glass TCLP vessels. Measure a 25 gram aliquot of each dredged material product sample and place in separate zero-headspace extractors (ZHE) for analysis of volatile organics. Measure an aliquot of the synthetic acid rain extraction fluid equal to 20 times the weight of each of the solid samples.

3. Combine the solid phase sample and the synthetic acid rain fluid in the TCLP extractor and begin agitation. Record the pH within 5-10 minutes after agitation has started.

4. Agitate the mixture for 24 hours, maintaining the temperature at 20-40 C (68-104 F). Record the pH at the end of the 24-hour extraction period. (All pH measurements will be taken on the bottle extraction only)

5. Employ the extraction fluid separation procedure as described in EPA Method 1311 (TCLP).

6. Analyze the extract for the constituents of concern identified in the Department's October 1997 technical manual. Dioxins/furans shall only be analyzed in the first and seventh extraction steps.

7. Repeat steps 3 through 6, six additional times. Do not allow the solid sample to dry before weighing.

8. Report the initial and final pH of each extraction and the concentration of each listed constituent of concern in each extract.

A final report, including the results of the sediment and dredged material product testing, will be presented to the Department in a series of nine (9) summary data tables:

- sediment bulk chemistry
- dredged material product bulk chemistry
- dredged material product leachate extraction steps.

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection
Site Remediation Program
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625
(609) 292-1250
FAX (609) 777-1914

Robert C. Shinn, Jr.
Commissioner

Mr. Gilbert M. Frank
Vice President
Stratus Petroleum Corporation
9040 Roswell Road
Suite 380
Atlanta, GA 30350

January 28, 1999

RE: Waterfront Development Permit/Water Quality Certificate
File: 0714-99-0001.1
Project: Stratus Petroleum Corporation – Newark Terminal
Newark, Essex County

Dear Mr. Frank:

This letter serves to clarify language contained within the document entitled "Analytical Testing Requirements for the Placement of Processed Dredged Material at the Koppers Seaboard Site" dated January 22, 1998 that was included as an attachment to the Waterfront Development Permit issued January 13, 1999 for the maintenance dredging of the berthing area at the facility.

The second paragraph of the section of the document regarding the protocol for the testing of processed dredged material references combining measured amounts of Portland Cement with raw sediments to create a "recipe" for testing of the material. Since the material after treatment at the BioGenesis facility will already be processed, this section of the protocol does not apply. It is understood that once the material is treated and placed in roll-off containers, three discrete samples of the material shall be collected and composited into one sample. The composite sample shall then be analyzed for bulk sediment chemistry and subjected to the modified Multiple Extraction Procedure (EPA Method 1320).

If you have any questions, please feel free to contact me at (609) 292-8838.

Sincerely,

Lawrence J. Baier

Lawrence J. Baier, Chief
Office of Dredging and Sediment Technology
Site Remediation Program

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Robert C. Shinn, Jr.
Commissioner

Mr. John Sontag, Jr., P.E.
Project Manager
Roy F. Weston, Inc.
1 Weston Way
West Chester, PA 19380-1499

MAR 24 1999

RE: Processing and Placement of Excess Dredged Material and Treated Sediment from BioGenesis Sediment Decontamination Demonstration Project
File No.: 0714-99-0001.1
Project: Stratus Petroleum Corporation – Newark Terminal

Dear Mr. Sontag:

In response to your letter, dated March 22, 1999, this letter serves to authorize the processing of approximately 200 cubic yards of excess dredged material from Stratus Petroleum at the SK Services (East), L.C. (SK) Port Newark facility. This material was not processed through the BioGenesis Sediment Decontamination Project, and is currently sitting in a scow at the Koppers Seaboard Site. The dredged material will be transported to the SK Services Dredged Material Processing Facility to be stabilized with Portland cement utilizing approximately a 10% slurry admixture. The scow would then be transported back to the Koppers Seaboard Site, off-loaded and stockpiled on the site pending analyses of the material for possible placement on the Koppers Seaboard Site.

The March 22, 1999 letter indicated that you propose to analyze the raw sediments for bulk sediment chemistry. In addition, you propose to analyze the processed dredged material for bulk sediment chemistry, and leachate quality using the Multiple Extraction Procedure (MEP). Please note that since analyses of the raw sediments were performed prior to the issuance of the Waterfront Development Permit/Water Quality Certificate for Stratus Petroleum, it is only necessary to perform analyses of the processed dredged material once it has been stockpiled. Specifically, three discrete samples shall be taken of the stockpile, those samples shall be composited into one sample, and analyzed for bulk sediment chemistry and leachate quality using the MEP for the target analytes specified in the Department's dredging manual, excluding volatile organic compounds.

Please be advised that this letter authorizes the temporary stockpile of the excess processed dredged material identified above provided that the material is located in a confined area, and is tarped at all times pending the submission of the above analyses.

The results of these analyses shall be submitted to the Office of Dredging and Sediment Technology, and HCIA, as soon as they become available in order to evaluate possible placement of the material on the Koppers Seaboard Site. Based on these results, the NJDEP will determine whether the material may be permanently placed on, or removed from, the Koppers Seaboard Site. A separate authorization letter is required from the NJDEP and HCIA prior to permanent placement of the material on the Koppers Seaboard Site.

If you have any questions, please feel free to contact me at (609) 292-8838.

Sincerely,

Lawrence J. Baier, Chief
Office of Dredging and Sediment Technology
Site Remediation Program

C: Micheal L. Hornsby
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APPENDIX B

DREDGED MATERIAL PLACEMENT SAMPLES – SUMMARY DATA

APPENDIX B
DREDGED MATERIAL PLACEMENT SAMPLES SUMMARY DATA
LIST OF TABLES

Table

Raw Dredged Material

B-1 Raw Dredged Material Analytical Data (from Validation Phase)

B-2 "Processed" RDM (Mixed with Portland Cement Prior to Analysis

B-3 "Processed" RDM, MEP #1 of 7

B-4 "Processed" RDM, MEP #2 of 7

B-5 "Processed" RDM, MEP #3 of 7

B-6 "Processed" RDM, MEP #4 of 7

B-7 "Processed" RDM, MEP #5 of 7

B-8 "Processed" RDM, MEP #6 of 7

B-9 "Processed" RDM, MEP #7 of 7

Decontaminated Sediment

B-10 Decontaminated Sediment Analytical Data (from Validation Phase)

B-11 "Processed" Decontaminated Sediment (Mixed with Portland Cement Prior to Analysis)

B-12 "Processed" Decontaminated Sediment, MEP #1 of 7

B-13 "Processed" Decontaminated Sediment, MEP #2 of 7

B-14 "Processed" Decontaminated Sediment, MEP #3 of 7

B-15 "Processed" Decontaminated Sediment, MEP #4 of 7

B-16 "Processed" Decontaminated Sediment, MEP #5 of 7

B-17 "Processed" Decontaminated Sediment, MEP #6 of 7

B-18 "Processed" Decontaminated Sediment, MEP #7 of 7

B-19 Sample Identification Reference

Apendix B - Dredged Material Placement Data

Notes/Abbreviations:

B = Estimated result for metals. Result is less than reporting limit (lower detection limit).
B = Compound (non-metal) is also detected in the blank.
D = Compound quantitated using a secondary dilution.
DL = Detection limit (also reporting limt).
E = Estimated result. Concentration exceeds calibration range.
F = Reported value estimated due to an interference.
J = Estimated result. Result is less than reporting limit (lower detection limit).
j = Estimated result below the lower calibration limit but above the target detection limit.
LDL = Lower detection limit.
MEP = Multiple extraction procedure.
NA = Not applicable. Compound not included in analysis.
ND = Compound not detected above the lower detection limit.
RDM = Raw dredged material.
TEQ = Total equivalent dioxins/furans.
v = Elevated detection limit due to chemical interference.

Table B-1

BioGenesis Demonstration Project
Raw Dredged Material (RDM) Analytical Data

Sample ID:	RAW-V1-SD-01			RAW-V1-SD-02			RAW-V1-SD-02-DUP			RAW-V2-SD-01			RAW-V3-SD-01		
Receiving Date	3/17/99			3/17/99			3/17/99			3/18/99			3/18/99		
Sample Date:	3/16/99			3/16/99			3/16/99			3/16/99			3/17/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
Volatile Organics															
Extraction Date	3/22/99			3/22/99			3/22/99			3/25/99			3/25/99		
Analysis Date:	3/22/99			3/22/99			3/22/99			3/25/99			3/25/99		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Acetone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19	6.1	ug/kg JB		5.8	ug/kg JB	
Benzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Bromodichloromethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Bromoform	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Bromomethane	ND	ug/kg	9.9	ND	ug/kg	9.9	ND	ug/kg	9.4	ND	ug/kg	10	ND	ug/kg	10
2-Butanone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19	ND	ug/kg	20	ND	ug/kg	20
Carbon disulfide	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Carbon tetrachloride	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Chlorobenzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Dibromochloromethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Chloroethane	ND	ug/kg	9.9	ND	ug/kg	9.9	ND	ug/kg	9.4	ND	ug/kg	10	ND	ug/kg	10
Chloroform	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Chloromethane	ND	ug/kg	9.9	ND	ug/kg	9.9	ND	ug/kg	9.4	ND	ug/kg	10	ND	ug/kg	10
1,1-Dichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
1,1-Dichloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloroethene (total)	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloropropane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
cis-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
trans-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Ethylbenzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
2-Hexanone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19	ND	ug/kg	20	ND	ug/kg	20
Methylene chloride	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
4-Methyl-2-pentanone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19	ND	ug/kg	20	ND	ug/kg	20
Styrene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Tetrachloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Toluene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
1,1,1-Trichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
1,1,2-Trichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Trichloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5
Vinyl chloride	ND	ug/kg	9.9	ND	ug/kg	9.9	ND	ug/kg	9.4	ND	ug/kg	10	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7	ND	ug/kg	5	ND	ug/kg	5

Table B-1

BioGenesis Demonstration Project
Raw Dredged Material (RDM) Analytical Data

Sample ID:	RAW-V1-SD-01			RAW-V1-SD-02			RAW-V1-SD-02-DUP			RAW-V2-SD-01			RAW-V3-SD-01		
Receiving Date	3/17/99			3/17/99			3/17/99			3/18/99			3/18/99		
Sample Date:	3/16/99			3/16/99			3/16/99			3/16/99			3/17/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
PAHs															
Extraction Date:	3/19/99			3/19/99			4/2/99			3/23/99			3/24/99		
Analysis Date:	4/7/99			4/7/99			4/12/99			4/11/99			4/6/99		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Results		LDL
Acenaphthene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Acenaphthylene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Anthracene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Benzo(a)anthracene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Benzo(a)pyrene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Benzo(b)fluoranthene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Benzo(k)fluoranthene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Benzo(ghi)perylene	100 ug/kg	J	330	160 ug/kg	J	330	170 ug/kg	J	310	ND ug/kg		330	160 ug/kg	J	330
4-Chloro-3-methylphenol	NA			ND ug/kg		330	NA			NA			NA		
2-Chlorophenol	NA			ND ug/kg		330	NA			NA			NA		
Chrysene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Dibenz(a,h)anthracene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Dibenzofuran	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
1,2-Dichlorobenzene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
1,3-Dichlorobenzene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
1,4-Dichlorobenzene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
2,4-Dinitrotoluene	NA			ND ug/kg		330	NA			NA			NA		
Fluoranthene	ND ug/kg		330	ND ug/kg		330	520 ug/kg		310	ND ug/kg		330	ND ug/kg		330
Fluorene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Hexachlorobenzene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Indeno(1,2,3-cd)pyrene	100 ug/kg	J	330	170 ug/kg	J	330	210 ug/kg	J	310	ND ug/kg		330	140 ug/kg	J	330
2-Methlynaphthalene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
4-Nitrophenol	NA			ND ug/kg		1600	NA			NA			NA		
N-Nitrosodi-n-proplamine	NA			ND ug/kg		330	NA			NA			NA		
Naphthalene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Nitrobenzene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Pentachlorophenol	ND ug/kg		1600	ND ug/kg		1600	ND ug/kg		1500	ND ug/kg		1600	ND ug/kg		1600
Phenanthrene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
Phenol	NA			ND ug/kg		330	NA			NA			NA		
Pyrene	ND ug/kg		330	ND ug/kg		330	ND ug/kg		310	ND ug/kg		330	ND ug/kg		330
1,2,4-Trichlorobenzene	NA			ND ug/kg		330	NA			NA			NA		

Table B-1

BioGenesis Demonstration Project
Raw Dredged Material (RDM) Analytical Data

Sample ID:	RAW-V1-SD-01			RAW-V1-SD-02			RAW-V1-SD-02-DUP			RAW-V2-SD-01			RAW-V3-SD-01		
Receiving Date	3/17/99			3/17/99			3/17/99			3/18/99			3/18/99		
Sample Date:	3/16/99			3/16/99			3/16/99			3/16/99			3/17/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
Herbicides															
Extraction Date	3/22/99			3/22/99			3/31/99			3/22/99			3/22/99		
Analysis Date:	3/30/99			3/30/99			4/13/99			3/30/99			3/30/99		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL
2,4-D	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19	ND	ug/kg	20	ND	ug/kg	20
2,4,5-TP (Silvex)	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	38	ND	ug/kg	40	ND	ug/kg	40
2,4,5-T	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	38	ND	ug/kg	40	ND	ug/kg	40
Pesticides															
Extraction Date	3/22/99			3/22/99			4/2/99			3/22/99			3/22/99		
Analysis Date:	4/8/99			4/8/99			4/9/99			4/8/99			4/8/99		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL
alpha-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
beta-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
delta-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
gamma-BHC (Lindane)	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Heptachlor	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Aldrin	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Heptachlor expoxide	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Endosulfan I	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Dieldrin	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
4,4' - DDE	3.7	ug/kg		2.5	ug/kg		4.5	ug/kg		4.0	ug/kg		2.2	ug/kg	
Endrin	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Endrin ketone	1.7	ug/kg		ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Endrin aldehyde	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Endosulfan II	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
4,4' - DDD	2.2	ug/kg		ND	ug/kg	1.7	2.3	ug/kg		5.5	ug/kg		ND	ug/kg	1.7
Endosulfan sulfate	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
4,4' - DDT	4.0	ug/kg		ND	ug/kg	1.7	ND	ug/kg	2.0	2.0	ug/kg		ND	ug/kg	1.7
Methoxychlor	ND	ug/kg	17	ND	ug/kg	17	ND	ug/kg	20	ND	ug/kg	17	ND	ug/kg	17
alpha-Chlordane	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
gamma-Chlordane	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0	ND	ug/kg	1.7	ND	ug/kg	1.7
Toxaphene	ND	ug/kg	67	ND	ug/kg	67	ND	ug/kg	79	ND	ug/kg	67	ND	ug/kg	67

Table B-1

BioGenesis Demonstration Project
Raw Dredged Material (RDM) Analytical Data

Sample ID:	RAW-V1-SD-01		RAW-V1-SD-02		RAW-V1-SD-02-DUP		RAW-V2-SD-01		RAW-V3-SD-01	
Receiving Date	3/17/99		3/17/99		3/17/99		3/18/99		3/18/99	
Sample Date:	3/16/99		3/16/99		3/16/99		3/16/99		3/17/99	
Matrix	SOLID		SOLID		SOLID		SOLID		SOLID	
PCBs										
Extraction Date:	3/22/99		3/22/99		4/2/99		3/22/99		3/22/99	
Analysis Date:	4/8/99		4/8/99		4/9/99		4/8/99		4/8/99	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Results	LDL
Aroclor 1016	ND ug/kg	33	ND ug/kg	33	NA ug/kg	97	ND ug/kg	33	ND ug/kg	33
Aroclor 1221	ND ug/kg	33	ND ug/kg	33	NA ug/kg	97	ND ug/kg	33	ND ug/kg	33
Aroclor 1232	ND ug/kg	33	ND ug/kg	33	NA ug/kg	97	ND ug/kg	33	ND ug/kg	33
Aroclor 1242	ND ug/kg	33	ND ug/kg	33	NA ug/kg	97	ND ug/kg	33	ND ug/kg	33
Aroclor 1248	ND ug/kg	33	ND ug/kg	33	NA ug/kg	97	ND ug/kg	33	ND ug/kg	33
Aroclor 1254	ND ug/kg	33	ND ug/kg	33	NA ug/kg	97	45 ug/kg	33	ND ug/kg	33
Aroclor 1260	ND ug/kg	33	ND ug/kg	33	NA ug/kg	97	ND ug/kg	33	ND ug/kg	33
PCB Congeners										
Receiving Date	3/18/99		3/18/99				3/23/99		3/23/99	
Sample Date	3/16/99		3/16/99				3/16/99		3/16/99	
Extraction Date	3/22/99		3/22/99				3/23/99		3/23/99	
Analysis Date:	4/6/99		4/6/99				4/18/99		4/18/99	
Analyte	Result	DL	Result	DL			Result	DL	Result	DL
2-MonoCB	460 pg/g	40	460 pg/g	40	NA		150 pg/g	2.0	190 pg/g	2.0
Total Monochlorobiphenyls	1,000 pg/g	40	1,100 pg/g	40	NA		470 pg/g	2.0	490 pg/g	2.0
4,4'-DiCB	6,400 pg/g	40	8,600 pg/g	40	NA		3,500 pg/g BE	2.0	3,700 pg/g BE	2.0
Total Dichlorobiphenyls	17,000 pg/g	40	23,000 pg/g	40	NA		10,000 pg/g	2.0	10,000 pg/g	2.0
2,4,4'-TriCB	18,000 pg/g	40	29,000 pg/g	40	NA		11,000 pg/g BE	2.0	11,000 pg/g BE	2.0
Total Trichlorobiphenyls	66,000 pg/g	40	110,000 pg/g	40	NA		35,000 pg/g	2.0	35,000 pg/g	2.0
2,2',5,5'-TetraCB	8,400 pg/g	40	15,000 pg/g	40	NA		4,800 pg/g BE	2.0	4,700 pg/g BE	2.0
3,3',4,4'-TetraCB (#77)	2,300 pg/g	40	2,700 pg/g	40	NA		1,200 pg/g	2.0	1,300 pg/g	2.0
Total Tetrachlorobiphenyls	69,000 pg/g	40	88,000 pg/g	40	NA		34,000 pg/g	2.0	34,000 pg/g	2.0
2,3,3',4,4'-PentaCB (#105)	4,600 pg/g	40	7,900 pg/g	40	NA		2,600 pg/g E	2.0	2,400 pg/g E	2.0
2,3',4,4',5-PentaCB (#118)	8,300 pg/g	40	14,000 pg/g	40	NA		5,200 pg/g BE	2.0	5,100 pg/g BE	2.0
3,3',4,4',5-Penta CB (#126)	62 pg/g	40	80 pg/g	40	NA		29 pg/g	2.0	32 pg/g	2.0
Total Pentachlorobiphenyls	77,000 pg/g	40	100,000 pg/g	40	NA		36,000 pg/g	2.0	37,000 pg/g	2.0
2,3,3',4,4',5-Hexa CB (#156)	910 pg/g	40	1,500 pg/g	40	NA		510 pg/g E	2.0	520 pg/g	2.0
3,3',4,4',5,5'-HexaCB (#169)	ND pg/g	40	ND pg/g	40	NA		ND pg/g	2.0	ND pg/g	2.0
Total Hexachlorobiphenyls	38,000 pg/g	40	62,000 pg/g	40	NA		20,000 pg/g	2.0	21,000 pg/g	2.0
2,2',3,4,4',5,5'-HeptaCB (#180)	6,000 pg/g	40	9,900 pg/g	40	NA		4,200 pg/g BE	2.0	4,200 pg/g BE	2.0
Total Heptachlorobiphenyls	21,000 pg/g	40	37,000 pg/g	40	NA		16,000 pg/g	2.0	16,000 pg/g	2.0
2,2',3,3',4,4',5,5'-OctaCB	1,700 pg/g	40	2,900 pg/g	40	NA		980 pg/g	2.0	970 pg/g	2.0
Total Octachlorobiphenyls	7,200 pg/g	40	12,000 pg/g	40	NA		2,700 pg/g	2.0	3,200 pg/g	2.0
2,2',3,3',4,4',5,5',6-NonaCB	2,000 pg/g	40	3,200 pg/g	40	NA		880 pg/g	2.0	1,000 pg/g	2.0
Total Nonachlorobiphenyls	2,500 pg/g	40	3,600 pg/g	40	NA		1,100 pg/g	2.0	1,300 pg/g	2.0
DecaCB	1,400 pg/g	40	2,400 pg/g	40	NA		910 pg/g	2.0	910 pg/g	2.0
TOTAL PCB VALUE (Calculated)	**718,464 pg/g**		**1,068,680 pg/g**		**NA**		**382,458 pg/g**		**388,024 pg/g**	

Table B-1

BioGenesis Demonstration Project
Raw Dredged Material (RDM) Analytical Data

Sample ID:	RAW-V1-SD-01		RAW-V1-SD-02		RAW-V1-SD-02-DUP	RAW-V2-SD-01		RAW-V3-SD-01	
Receiving Date	3/17/99		3/17/99		3/17/99	3/18/99		3/18/99	
Sample Date:	3/16/99		3/16/99		3/16/99	3/16/99		3/17/99	
Matrix	SOLID		SOLID		SOLID	SOLID		SOLID	
Priority Pollutant Metals									
Extraction Date:	3/30/99		3/30/99			3/30/99		3/30/99	
Analysis Date:	4/2/99		4/2/99			4/2/99		4/2/99	
Analyte	Result	LDL	Result	LDL		Result	LDL	Results	LDL
Antimony	1.6 mg/kg	0.31	0.16 mg/kg B	0.32	NA	ND mg/kg	0.26	ND mg/kg	0.28
Arsenic	14.7 mg/kg	1.5	11.5 mg/kg	1.6	NA	11.2 mg/kg	1.3	8.3 mg/kg	1.4
Beryllium	1.1 mg/kg	0.31	0.78 mg/kg	0.32	NA	0.76 mg/kg	0.26	0.56 mg/kg	0.28
Cadmium	3.4 mg/kg	0.31	2.6 mg/kg	0.32	NA	2.6 mg/kg	0.26	1.9 mg/kg	0.28
Chromium	172 mg/kg	0.31	133 mg/kg	0.32	NA	128 mg/kg	0.26	97.4 mg/kg	0.28
Copper	173 mg/kg	0.31	130 mg/kg	0.32	NA	122 mg/kg	0.26	89.7 mg/kg	0.28
Lead	181 mg/kg	1.5	147 mg/kg	0.32	NA	134 mg/kg	1.3	95.8 mg/kg	0.28
Nickel	43.7 mg/kg	0.31	32.9 mg/kg	0.32	NA	30.8 mg/kg	0.26	22.3 mg/kg	0.28
Selenium	1.4 mg/kg B	1.5	1.3 mg/kg B	1.6	NA	1.2 mg/kg B	1.3	1.1 mg/kg B	1.4
Thallium	0.3 mg/kg B	0.31	0.22 mg/kg B	0.32	NA	0.21 mg/kg B	0.26	0.16 mg/kg B	0.28
Zinc	322 mg/kg	3.1	250 mg/kg	3.2	NA	236 mg/kg	2.6	175 mg/kg	2.8
Mercury	2.8 mg/kg	0.51	3.5 mg/kg	0.53	NA	3.5 mg/kg	0.43	3.1 mg/kg	0.46
Extraction Date:	4/7/99		4/7/99			4/7/99		4/7/99	
Analysis Date:	4/8/99		4/8/99			4/8/99		4/8/99	
Silver	3.4 mg/kg	0.31	2 mg/kg	0.32	NA	1.7 mg/kg	0.26	1.7 mg/kg	0.28
Extraction Date:	4/5/99		4/5/99			4/5/99		4/5/99	
Analysis Date:	4/6/99		4/6/99			4/6/99		4/6/99	
General Chemistry									
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Results	LDL
Percent Moisture	NA		NA		68.7 %		NA		NA	
Extraction Date:					3/22/99					
Analysis Date:					3/23/99					
Percent Solids	31.3 %	1	32.3 %	1	33.9 %	1	32 %	1	32 %	1
Receiving Date	3/17/99		3/17/99		3/17/99		3/18/99		3/18/99	
Extraction Date:	3/17/99		3/17/99		3/23/99		3/19/99		3/19/99	
Analysis Date:	3/18/99		3/18/99		3/24/99		3/20/99		3/20/99	
Percent Solids	32.3 %	1	31.3 %	1	NA		38.2 %		NA	
Receiving Date	3/18/99		3/18/99				36237			
Extraction Date:	3/22/99		3/22/99				3/30/99			
Analysis Date:	3/23/99		3/23/99				4/2/99			
pH (solid)	7.3 No Uni		7.3 No Uni		7.1 No Uni		7.1 No Uni		7.2 No Uni	
Receiving Date	3/17/99		3/17/99		3/17/99		3/18/99		3/18/99	
Extraction Date:	3/17/99		3/17/99		4/7/99		3/19/99		3/19/99	
Analysis Date:	3/17/99		3/17/99		4/7/99		3/19/99		3/19/99	
Total Organic Carbon	34,100 mg/kg	236	29,300 mg/kg	208	29,100 mg/kg	189	16,100 mg/kg	230	21,000 mg/kg	232
Extraction Date:	4/7/99		4/7/99				4/7/99		4/7/99	
Analysis Date:	4/7/99		4/7/99				4/7/99		4/7/99	
Acid-insoluble Sulfide	1,360 mg/kg	160	1,190 mg/kg	155	1,180 mg/kg	148	ND mg/kg	131	ND mg/kg	138
Extraction Date:	3/23/99		3/23/99		3/23/99		3/22/99		3/22/99	
Analysis Date:	3/23/99		3/23/99		3/23/99		3/22/99		3/22/99	

Tab B-1 (con't)

BioGenesis Demonstration Project
Raw Dredged Material (RDM) Analytical Data

Sample ID:	RAW-V1-SD-01			RAW-V1-SD-02			RAW-V1-SD-02-DUP	RAW-V2-SD-01			RAW-V3-SD-01		
Receiving Date	3/18/99			3/18/99			NA	3/23/99			3/23/99		
Sample Date	3/16/99			3/16/99			NA	3/16/99			3/16/99		
Extraction Date	3/23/99			3/23/99			NA	3/23/99			3/23/99		
Analysis Date:	4/1/99			4/1/99			NA	4/29/99			4/25/99		
Matrix	Solid			Solid			NA	Solid			Solid		
Analyte	Result		DL	Result		DL	NA	Result		DL	Result		DL
Furans													
TCDFs (total)	240	pg/g		230	pg/g		NA	140	pg/g		130	pg/g	
2,3,7,8-TCDF	14	pg/g	g	11	pg/g	g	NA	5.3	pg/g	g	5.8	pg/g	g
PeCDFs (total)	230	pg/g		210	pg/g		NA	120	pg/g		110	pg/g	
1,2,3,7,8-PeCDF	8.4	pg/g		7.2	pg/g		NA	3.6	pg/g	j	3.6	pg/g	j
2,3,4,7,8-PeCDF	18	pg/g		13	pg/g		NA	7	pg/g		5.8	pg/g	
HxCDFs (total)	210	pg/g		180	pg/g		NA	100	pg/g		120	pg/g	
1,2,3,4,7,8-HxCDF	76	pg/g		64	pg/g		NA	30	pg/g		36	pg/g	
1,2,3,6,7,8-HxCDF	ND	pg/g	v	18	ND	pg/g	v	15	NA	8.4	pg/g		9.4	pg/g	
2,3,4,6,7,8-HxCDF	7.8	pg/g		6.9	pg/g		NA	ND	pg/g	2.2	ND	pg/g	2
1,2,3,7,8,9-HxCDF	ND	pg/g		0.29	ND	pg/g		0.52	NA	ND	pg/g	1.2	ND	pg/g	2.2
HpCDFs (total)	360	pg/g		310	pg/g		NA	170	pg/g		190	pg/g	
1,2,3,4,6,7,8-HpCDF	260	pg/g		220	pg/g		NA	120	pg/g		140	pg/g	
1,2,3,4,7,8,9-HpCDF	9.8	pg/g		8.2	pg/g		NA	4.4	pg/g	j	ND	pg/g	1.5
OCDF	350	pg/g		290	pg/g		NA	180	pg/g		200	pg/g	
Dioxins													
TCDDs (total)	76	pg/g		88	pg/g		NA	55	pg/g		48	pg/g	
2,3,7,8-TCDD	52	pg/g		54	pg/g		NA	37	pg/g		28	pg/g	
PeCDDs (total)	13	pg/g		17	pg/g		NA	2.8	pg/g		3.5	pg/g	
1,2,3,7,8-PeCDD	ND	pg/g		2	ND	pg/g		2.2	NA	ND	pg/g	1.1	ND	pg/g	2.2
HxCDDs (total)	130	pg/g		140	pg/g		NA	60	pg/g		110	pg/g	
1,2,3,4,7,8-HxCDD	2.9	pg/g		3.1	pg/g		NA	ND	pg/g	1.4	ND	pg/g	2.8
1,2,3,6,7,8-HxCDD	12	pg/g		12	pg/g		NA	6	pg/g		5.6	pg/g	
1,2,3,7,8,9-HxCDD	10	pg/g		11	pg/g		NA	4.2	pg/g	j	8.8	pg/g	
HpCDDs (total)	400	pg/g		400	pg/g		NA	210	pg/g		370	pg/g	
1,2,3,4,6,7,8-HpCDD	180	pg/g		170	pg/g		NA	93	pg/g		110	pg/g	
OCDD	1,800	pg/g		1,700	pg/g		NA	930	pg/g		1,000	pg/g	
TEQ (Calculated)	**80.34**	**pg/g**		**77.63**	**pg/g**		**NA**	**49.35**	**pg/g**		**41.34**	**pg/g**	

Table B-2
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)

Sample ID:	**SCOW MATERIAL**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/1/99		
Analysis Date:	7/21/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene	ND	1400	ug/kg
Acenaphthylene	ND	1400	ug/kg
Anthracene	ND	1400	ug/kg
Benzo(a)anthracene	ND	1400	ug/kg
Benzo(a)pyrene	ND	1400	ug/kg
Benzo(b)fluoranthene	ND	1400	ug/kg
Benzo(k)fluoranthene	ND	1400	ug/kg
Benzo(ghi)perylene	440 J	1400	ug/kg
bis(2-Chloroethoxy)methane	ND	1400	ug/kg
bis(2-Chloroethyl) ether	ND	1400	ug/kg
bis(2-Ethylhexyl) phthalate	22000	1400	ug/kg
4-Bromophenyl phenyl ether	ND	1400	ug/kg
Butyl benzyl phthalate	ND	1400	ug/kg
Carbazole	ND	1400	ug/kg
4-Chloro-3-methylphenol	ND	1400	ug/kg
4-Chloroaniline	ND	1400	ug/kg
2-Chloronaphthalene	ND	1400	ug/kg
2-Chlorophenol	ND	1400	ug/kg
4-Chlorophenyl phenyl ether	ND	1400	ug/kg
Chrysene	1100 J	1400	ug/kg
Dibenz(a,h)anthracene	ND	1400	ug/kg
Dibenzofuran	ND	1400	ug/kg
1,2-Dichlorobenzene	ND	1400	ug/kg
1,3-Dichlorobenzene	ND	1400	ug/kg
1,4-Dichlorobenzene	ND	1400	ug/kg
3,3'-Dichlorobenzidine	ND	7000	ug/kg
2,4-Dichlorophenol	ND	1400	ug/kg
Di-n-butyl phthalate	ND	1400	ug/kg
Di-n-octyl phthalate	ND	1400	ug/kg
Diethyl phthalate	ND	1400	ug/kg
2,4-Dimethylphenol	ND	1400	ug/kg
Dimethyl phthalate	ND	1400	ug/kg
4,6-Dinitro-2-methylphenol	ND	7000	ug/kg
2,4-Dinitrophenol	ND	7000	ug/kg
2,4-Dinitrotoluene	ND	1400	ug/kg
2,6-Dinitrotoluene	ND	1400	ug/kg
Fluoranthene	2100	1400	ug/kg
Fluorene	ND	1400	ug/kg
Hexachlorobenzene	ND	1400	ug/kg
Hexachlorobutadiene	ND	1400	ug/kg
Hexachlorocyclopentadiene	ND	7000	ug/kg
Hexachloroethane	ND	1400	ug/kg
Indeno(1,2,3-cd)pyrene	440 J	1400	ug/kg
Isophorone	ND	1400	ug/kg
2-Methylnaphthalene	ND	1400	ug/kg
2-Methylphenol	ND	1400	ug/kg
3-Methylphenol & 4-Methylpheno	ND	1400	ug/kg
2-Nitroaniline	ND	7000	ug/kg
3-Nitroaniline	ND	7000	ug/kg
4-Nitroaniline	ND	7000	ug/kg
2-Nitrophenol	ND	1400	ug/kg
4-Nitrophenol	ND	7000	ug/kg
N-Nitrosodi-n-propylamine	ND	1400	ug/kg
N-Nitrosodiphenylamine	ND	1400	ug/kg
Semivolatile Organics (continued)			
Naphthalene	ND	1400	ug/kg

Table B-2
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)

Sample ID:	**SCOW MATERIAL**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/1/99		
Analysis Date:	7/21/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Nitrobenzene	ND	1400	ug/kg
2,2'-oxybis(1-Chloropropane)	ND	1400	ug/kg
Pentachlorophenol	ND	7000	ug/kg
Phenanthrene	ND	1400	ug/kg
Phenol	ND	1400	ug/kg
Pyrene	1700	1400	ug/kg
1,2,4-Trichlorobenzene	ND	1400	ug/kg
2,4,5-Trichlorophenol	ND	1400	ug/kg
2,4,6-Trichlorophenol	ND	1400	ug/kg
Herbicides			
2,4-D	ND	35	ug/kg
2,4,5-TP (Silvex)	ND	70	ug/kg
2,4,5-T	ND	70	ug/kg
Pesticides			
alpha-BHC	ND	3	ug/kg
beta-BHC	ND	3	ug/kg
delta-BHC	ND	3	ug/kg
gamma-BHC (Lindane)	ND	3	ug/kg
Heptachlor	ND	3	ug/kg
Aldrin	ND	3	ug/kg
Heptachlor epoxide	ND	3	ug/kg
Endosulfan I	ND	3	ug/kg
Dieldrin	ND	3	ug/kg
4,4'-DDE	9.8	3	ug/kg
Endrin	ND	3	ug/kg
Endrin ketone	ND	3	ug/kg
Endrin aldehyde	ND	3	ug/kg
Endosulfan II	ND	3	ug/kg
4,4'-DDD	6.5	3	ug/kg
Endosulfan sulfate	ND	3	ug/kg
4,4'-DDT	4.4	3	ug/kg
Methoxychlor	ND	30	ug/kg
alpha-Chlordane	ND	3	ug/kg
gamma-Chlordane	3	3	ug/kg
Toxaphene	ND	120	ug/kg
PCBs			
Aroclor 1016	ND	58	ug/kg
Aroclor 1221	ND	58	ug/kg
Aroclor 1232	ND	58	ug/kg
Aroclor 1242	ND	58	ug/kg
Aroclor 1248	110	58	ug/kg
Aroclor 1254	97	58	ug/kg
Aroclor 1260	ND	58	ug/kg
Inorganics			
Aluminum	14700	35	mg/kg
Antimony	0.80 BN	1.8	mg/kg
Arsenic	12.2	1.8	mg/kg
Barium	146	35	mg/kg
Beryllium	1.1	0.88	mg/kg
Cadmium	1.7	0.35	mg/kg
Calcium	69900	876	mg/kg
Chromium	126	0.88	mg/kg
Inorganics (continued)			
Cobalt	10.3	8.8	mg/kg
Copper	121	4.4	mg/kg
Iron	25600	17.5	mg/kg
Lead	115	0.53	mg/kg

Table B-2
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)

Sample ID:	**SCOW MATERIAL**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/1/99		
Analysis Date:	7/21/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Magnesium	11100	876	mg/kg
Manganese	534	2.6	mg/kg
Mercury	2.8	0.18	mg/kg
Nickel	33.3	7	mg/kg
Potassium	3240	876	mg/kg
Selenium	0.51 B	0.88	mg/kg
Silver	2.6	0.88	mg/kg
Sodium	10400	876	mg/kg
Thallium	2	1.8	mg/kg
Total Cyanide	ND	4.4	mg/kg
Vanadium	36.5	8.8	mg/kg
Zinc	225	3.5	mg/kg
General Chemistry			
Percent Solids	57.1		%
Total Organic Carbon	15300	87.5	mg/kg
Furans			
Total TCDF	430		pg/g
2,3,7,8-TCDF	20		pg/g
Total PeCDF	400		pg/g
1,2,3,7,8-PeCDF	14		pg/g
2,3,4,7,8-PeCDF	25		pg/g
Total HxCDF	520		pg/g
1,2,3,4,7,8-HxCDF	200		pg/g
1,2,3,6,7,8-HxCDF	39		pg/g
2,3,4,6,7,8-HxCDF	15		pg/g
1,2,3,4,7,8,9-HpCDF	25		pg/g
1,2,3,7,8,9-HxCDF	ND	0.21	pg/g
Total HpCDF	1100		pg/g
1,2,3,4,6,7,8-HpCDF	840		pg/g
OCDF	1100		pg/g
Dioxins			
Total TCDD	160		pg/g
2,3,7,8-TCDD	95		pg/g
Total PeCDD	17		pg/g
1,2,3,7,8-PeCDD	ND	3.9	pg/g
Total HxCDD	250		pg/g
1,2,3,4,7,8-HxCDD	ND	4.2	pg/g
1,2,3,6,7,8-HxCDD	25		pg/g
1,2,3,7,8,9-HxCDD	16		pg/g
Total HpCDD	970		pg/g
1,2,3,4,6,7,8-HpCDD	370		pg/g
OCDD	3600		pg/g
TEQ (calculated)	170		pg/g

Table B-3
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #1 of 7

		SCOW MATERIAL	LEACH
Sample ID:		**#1**	
Receiving Date:		6/25/99	
Sample Date:		6/24/99	
Extraction Date:		7/8/99	
Analysis Date:		7/19/99	
Matrix:		SOLID	
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -S	0.0046 J	0.01	mg/L
4-Bromophenyl phenyl ether -SP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -S	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.052	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.052	mg/L
2,4-Dinitrophenol -SPLP	ND	0.052	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPL	ND	0.052	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylpheno	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.052	mg/L
3-Nitroaniline -SPLP	ND	0.052	mg/L
4-Nitroaniline -SPLP	ND	0.052	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.052	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-3
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #1 of 7

	SCOW MATERIAL		LEACH
Sample ID:	**#1**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/8/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.052	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	0.0092 J	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.008	mg/L
2,4-DB -SPLP	ND	0.008	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.002	mg/L
2,4,5-T -SPLP	ND	0.002	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.1	ug/L
beta-BHC -SPLP	ND	0.1	ug/L
delta-BHC -SPLP	ND	0.1	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.1	ug/L
Heptachlor -SPLP	ND	0.1	ug/L
Aldrin -SPLP	ND	0.1	ug/L
Heptachlor epoxide -SPLP	ND	0.1	ug/L
Endosulfan I -SPLP	ND	0.1	ug/L
Dieldrin -SPLP	ND	0.1	ug/L
4,4'-DDE -SPLP	ND	0.1	ug/L
Endrin -SPLP	ND	0.1	ug/L
Endrin ketone -SPLP	ND	0.1	ug/L
Endrin aldehyde -SPLP	ND	0.1	ug/L
Endosulfan II -SPLP	ND	0.1	ug/L
4,4'-DDD -SPLP	ND	0.1	ug/L
Endosulfan sulfate -SPLP	ND	0.1	ug/L
4,4'-DDT -SPLP	ND	0.1	ug/L
Methoxychlor -SPLP	ND	1	ug/L
alpha-Chlordane -SPLP	ND	0.1	ug/L
gamma-Chlordane -SPLP	ND	0.1	ug/L
Toxaphene -SPLP	ND	4	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	2	ug/L
Aroclor 1221 -SPLP	ND	2	ug/L
Aroclor 1232 -SPLP	ND	2	ug/L
Aroclor 1242 -SPLP	ND	2	ug/L
Aroclor 1248 -SPLP	ND	2	ug/L
Aroclor 1254 -SPLP	ND	2	ug/L
Aroclor 1260 -SPLP	ND	2	ug/L
Inorganics			
Aluminum -SPLP	1220	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	ND	10	ug/L
Barium -SPLP	205	200	ug/L
Beryllium -SPLP	0.14 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	317000	5000	ug/L
Chromium -SPLP	16.2	5	ug/L

Table B-3
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #1 of 7

	SCOW MATERIAL		LEACH
Sample ID:	**#1**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/8/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	2.6 B	50	ug/L
Copper -SPLP	208	25	ug/L
Iron -SPLP	32.9 B	100	ug/L
Lead -SPLP	ND	3	ug/L
Magnesium -SPLP	40.7 B	5000	ug/L
Manganese -SPLP	ND	15	ug/L
Mercury -SPLP	0.10 B	0.2	ug/L
Nickel -SPLP	48.2	40	ug/L
Potassium -SPLP	32100	5000	ug/L
Selenium -SPLP	ND	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	215000	5000	ug/L
Thallium -SPLP	3.6 B	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	4.8 B	50	ug/L
Zinc -SPLP	ND	20	ug/L
General Chemistry			
Total Organic Carbon	26.8	1	mg/L
Furans			
Total TCDF -SPLP	ND	1.6	pg/L
2,3,7,8-TCDF -SPLP	ND	1.6	pg/L
Total PeCDF -SPLP	ND	4	pg/L
1,2,3,7,8-PeCDF -SPLP	ND	4	pg/L
2,3,4,7,8-PeCDF-SPLP	ND	3.9	pg/L
Total HxCDF -SPLP	ND	1.4	pg/L
1,2,3,4,7,8-HxCDF -SPLP	ND	1.3	pg/L
1,2,3,6,7,8-HxCDF -SPLP	ND	0.93	pg/L
2,3,4,6,7,8-HxCDF -SPLP	ND	1.2	pg/L
1,2,3,4,7,8,9-HpCDF -SPLP	ND	1.6	pg/L
1,2,3,7,8,9-HxCDF -SPLP	ND	1.4	pg/L
Total HpCDF -SPLP	ND	1.6	pg/L
1,2,3,4,6,7,8-HpCDF -SPLP	ND	1.1	pg/L
OCDF -SPLP	ND	3.3	pg/L
Dioxins			
Total TCDD -SPLP	ND	4.6	pg/L
2,3,7,8-TCDD -SPLP	ND	4.6	pg/L
Total PeCDD -SPLP	ND	4.6	pg/L
1,2,3,7,8-PeCDD -SPLP	ND	4.6	pg/L
Total HxCDD -SPLP	ND	4.2	pg/L
1,2,3,4,7,8-HxCDD -SPLP	ND	4.2	pg/L
1,2,3,6,7,8-HxCDD -SPLP	ND	3.4	pg/L
1,2,3,7,8,9-HxCDD -SPLP	ND	3.5	pg/L
Total HpCDD -SPLP	ND	4.2	pg/L
1,2,3,4,6,7,8-HpCDD -SPLP	ND	4.2	pg/L
OCDD -SPLP	ND	9.6	pg/L
TEQ (calculated)	0		pg/L

Table B-4
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #2 of 7

Sample ID:	**SCOW MATERIAL LEACH #2**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -S	ND	0.01	mg/L
4-Bromophenyl phenyl ether -SP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -S	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.051	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.051	mg/L
2,4-Dinitrophenol -SPLP	ND	0.051	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.051	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.051	mg/L
3-Nitroaniline -SPLP	ND	0.051	mg/L
4-Nitroaniline -SPLP	ND	0.051	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.051	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-4
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #2 of 7

Sample ID:	**SCOW MATERIAL LEACH #2**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.051	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -SPLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.001	mg/L
2,4,5-T -SPLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	1640	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	ND	10	ug/L
Barium -SPLP	116 B	200	ug/L
Beryllium -SPLP	0.09 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	239000	5000	ug/L
Chromium -SPLP	14.7	5	ug/L

Table B-4
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #2 of 7

Sample ID:	**SCOW MATERIAL LEACH #2**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	1.8 B	50	ug/L
Copper -SPLP	56.4	25	ug/L
Iron -SPLP	14.6 B	100	ug/L
Lead -SPLP	ND	3	ug/L
Magnesium -SPLP	42.3 B	5000	ug/L
Manganese -SPLP	ND	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	12.6 B	40	ug/L
Potassium -SPLP	4550 B	5000	ug/L
Selenium -SPLP	ND	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	26500	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	ND	50	ug/L
Zinc -SPLP	ND	20	ug/L
General Chemistry			
Total Organic Carbon	6.9	1	mg/L

Table B-5
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #3 of 7

	SCOW MATERIAL		
Sample ID:	**LEACH #3**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.011	mg/L
Acenaphthylene -SPLP	ND	0.011	mg/L
Anthracene -SPLP	ND	0.011	mg/L
Benzo(a)anthracene -SPLP	ND	0.011	mg/L
Benzo(a)pyrene -SPLP	ND	0.011	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.011	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.011	mg/L
Benzo(ghi)perylene -SPLP	ND	0.011	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.011	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.011	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	ND	0.011	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.011	mg/L
Butyl benzyl phthalate -SPLP	ND	0.011	mg/L
Carbazole -SPLP	ND	0.011	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.011	mg/L
4-Chloroaniline -SPLP	ND	0.011	mg/L
2-Chloronaphthalene -SPLP	ND	0.011	mg/L
2-Chlorophenol -SPLP	ND	0.011	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.011	mg/L
Chrysene -SPLP	ND	0.011	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.011	mg/L
Dibenzofuran -SPLP	ND	0.011	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.011	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.011	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.011	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.054	mg/L
2,4-Dichlorophenol -SPLP	ND	0.011	mg/L
Di-n-butyl phthalate -SPLP	ND	0.011	mg/L
Di-n-octyl phthalate -SPLP	ND	0.011	mg/L
Diethyl phthalate -SPLP	ND	0.011	mg/L
2,4-Dimethylphenol -SPLP	ND	0.011	mg/L
Dimethyl phthalate -SPLP	ND	0.011	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.054	mg/L
2,4-Dinitrophenol -SPLP	ND	0.054	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.011	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.011	mg/L
Fluoranthene -SPLP	ND	0.011	mg/L
Fluorene -SPLP	ND	0.011	mg/L
Hexachlorobenzene -SPLP	ND	0.011	mg/L
Hexachlorobutadiene -SPLP	ND	0.011	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.054	mg/L
Hexachloroethane -SPLP	ND	0.011	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.011	mg/L
Isophorone -SPLP	ND	0.011	mg/L
2-Methylnaphthalene -SPLP	ND	0.011	mg/L
2-Methylphenol -SPLP	ND	0.011	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.011	mg/L
2-Nitroaniline -SPLP	ND	0.054	mg/L
3-Nitroaniline -SPLP	ND	0.054	mg/L
4-Nitroaniline -SPLP	ND	0.054	mg/L
2-Nitrophenol -SPLP	ND	0.011	mg/L
4-Nitrophenol -SPLP	ND	0.054	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.011	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.011	mg/L

Table B-5
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #3 of 7

	SCOW MATERIAL		
Sample ID:	**LEACH #3**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.011	mg/L
Nitrobenzene -SPLP	ND	0.011	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.011	mg/L
Pentachlorophenol -SPLP	ND	0.054	mg/L
Phenanthrene -SPLP	ND	0.011	mg/L
Phenol -SPLP	ND	0.011	mg/L
Pyrene -SPLP	ND	0.011	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.011	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.011	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.011	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -SPLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.001	mg/L
2,4,5-T -SPLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	1640	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	ND	10	ug/L
Barium -SPLP	24.2 B	200	ug/L
Beryllium -SPLP	0.07 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	112000	5000	ug/L
Chromium -SPLP	20.6	5	ug/L

Table B-5
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #3 of 7

	SCOW MATERIAL		
Sample ID:	**LEACH #3**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	ND	50	ug/L
Copper -SPLP	39.4	25	ug/L
Iron -SPLP	17.6 B	100	ug/L
Lead -SPLP	ND	3	ug/L
Magnesium -SPLP	39.6 B	5000	ug/L
Manganese -SPLP	ND	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	1860 B	5000	ug/L
Selenium -SPLP	2.2 B	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	10400	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	15.1 B	50	ug/L
Zinc -SPLP	ND	20	ug/L
General Chemistry			
Total Organic Carbon	4.1	1	mg/L

Table B-6
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #4 of 7

		SCOW MATERIAL	LEACH
Sample ID:		**#4**	
Receiving Date:		6/25/99	
Sample Date:		6/24/99	
Extraction Date:		7/14/99	
Analysis Date:		7/22/99	
Matrix:		SOLID	
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	0.0071 J	0.01	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.052	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.052	mg/L
2,4-Dinitrophenol -SPLP	ND	0.052	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.052	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.052	mg/L
3-Nitroaniline -SPLP	ND	0.052	mg/L
4-Nitroaniline -SPLP	ND	0.052	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.052	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-6
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #4 of 7

		SCOW MATERIAL	LEACH
Sample ID:		**#4**	
Receiving Date:		6/25/99	
Sample Date:		6/24/99	
Extraction Date:		7/14/99	
Analysis Date:		7/22/99	
Matrix:		SOLID	
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.052	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -TCLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -TCLP	ND	0.001	mg/L
2,4,5-T -TCLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	1280	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	ND	10	ug/L
Barium -SPLP	49.9 B	200	ug/L
Beryllium -SPLP	0.09 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	132000	5000	ug/L
Chromium -SPLP	26	5	ug/L

Table B-6
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #4 of 7

		SCOW MATERIAL	LEACH
Sample ID:		**#4**	
Receiving Date:		6/25/99	
Sample Date:		6/24/99	
Extraction Date:		7/14/99	
Analysis Date:		7/22/99	
Matrix:		SOLID	
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	ND	50	ug/L
Copper -SPLP	31.4	25	ug/L
Iron -SPLP	7.8 B	100	ug/L
Lead -SPLP	ND	3	ug/L
Magnesium -SPLP	62.1 B	5000	ug/L
Manganese -SPLP	ND	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	1960 B	5000	ug/L
Selenium -SPLP	1.7 B	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	18500	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	5.2 B	50	ug/L
Zinc -SPLP	6.1 B	20	ug/L
General Chemistry			
Total Organic Carbon	3.6	1	mg/L

Table B-7
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #5 of 7

Sample ID:	**SCOW MATERIAL LEACH #5**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/16/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	ND	0.01	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.052	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.052	mg/L
2,4-Dinitrophenol -SPLP	ND	0.052	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.052	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.052	mg/L
3-Nitroaniline -SPLP	ND	0.052	mg/L
4-Nitroaniline -SPLP	ND	0.052	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.052	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-7
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #5 of 7

Sample ID:	**SCOW MATERIAL LEACH #5**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/16/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.052	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -SPLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.001	mg/L
2,4,5-T -SPLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	827	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	ND	10	ug/L
Barium -SPLP	16.0 B	200	ug/L
Beryllium -SPLP	0.20 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	76600	5000	ug/L
Chromium -SPLP	21.1	5	ug/L

Table B-7
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #5 of 7

Sample ID:	**SCOW MATERIAL LEACH #5**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/16/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	2.4 B	50	ug/L
Copper -SPLP	28.3	25	ug/L
Iron -SPLP	11.3 B	100	ug/L
Lead -SPLP	ND	3	ug/L
Magnesium -SPLP	95.3 B	5000	ug/L
Manganese -SPLP	ND	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	1310 B	5000	ug/L
Selenium -SPLP	1.8 B	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	17200	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	24.4 B	50	ug/L
Zinc -SPLP	ND	20	ug/L
General Chemistry			
Total Organic Carbon	3.5	1	mg/L

Table B-8
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #6 of 7

Sample ID:	**SCOW MATERIAL LEACH #6**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/19/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	0.0059 J	0.01	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.051	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.051	mg/L
2,4-Dinitrophenol -SPLP	ND	0.051	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.051	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.051	mg/L
3-Nitroaniline -SPLP	ND	0.051	mg/L
4-Nitroaniline -SPLP	ND	0.051	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.051	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-8
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #6 of 7

Sample ID:	**SCOW MATERIAL LEACH #6**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/19/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.051	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -SPLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.001	mg/L
2,4,5-T -SPLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	421	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	ND	10	ug/L
Barium -SPLP	22.0 B	200	ug/L
Beryllium -SPLP	0.10 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	69700	5000	ug/L
Chromium -SPLP	32.7	5	ug/L

Table B-8
BioGenesis Demonstration Project
"Processed" Raw Dredged Materials
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #6 of 7

Sample ID:	**SCOW MATERIAL**		**LEACH #6**
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/19/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	2.9 B	50	ug/L
Copper -SPLP	25.5	25	ug/L
Iron -SPLP	11.8 B	100	ug/L
Lead -SPLP	ND	3	ug/L
Magnesium -SPLP	80.3 B	5000	ug/L
Manganese -SPLP	1.4 B	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	2310 B	5000	ug/L
Selenium -SPLP	ND	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	36200	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	22.6 B	50	ug/L
Zinc -SPLP	ND	20	ug/L
General Chemistry			
Total Organic Carbon	3.5	1	mg/L

Table B-9
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching # 7 of 7

	SCOW MATERIAL LEACH		
Sample ID:	**#7**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/20/99		
Analysis Date:	8/3/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	ND	0.01	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.051	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.051	mg/L
2,4-Dinitrophenol -SPLP	ND	0.051	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.051	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.051	mg/L
3-Nitroaniline -SPLP	ND	0.051	mg/L
4-Nitroaniline -SPLP	ND	0.051	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.051	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-9
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching # 7 of 7

	SCOW MATERIAL LEACH		
Sample ID:	**#7**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/20/99		
Analysis Date:	8/3/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.051	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.008	mg/L
2,4-DB -SPLP	ND	0.008	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.002	mg/L
2,4,5-T -SPLP	ND	0.002	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.1	ug/L
beta-BHC -SPLP	ND	0.1	ug/L
delta-BHC -SPLP	ND	0.1	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.1	ug/L
Heptachlor -SPLP	ND	0.1	ug/L
Aldrin -SPLP	ND	0.1	ug/L
Heptachlor epoxide -SPLP	ND	0.1	ug/L
Endosulfan I -SPLP	ND	0.1	ug/L
Dieldrin -SPLP	ND	0.1	ug/L
4,4'-DDE -SPLP	ND	0.1	ug/L
Endrin -SPLP	ND	0.1	ug/L
Endrin ketone -SPLP	ND	0.1	ug/L
Endrin aldehyde -SPLP	ND	0.1	ug/L
Endosulfan II -SPLP	ND	0.1	ug/L
4,4'-DDD -SPLP	ND	0.1	ug/L
Endosulfan sulfate -SPLP	ND	0.1	ug/L
4,4'-DDT -SPLP	ND	0.1	ug/L
Methoxychlor -SPLP	ND	1	ug/L
alpha-Chlordane -SPLP	ND	0.1	ug/L
gamma-Chlordane -SPLP	ND	0.1	ug/L
Toxaphene -SPLP	ND	4	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	2	ug/L
Aroclor 1221 -SPLP	ND	2	ug/L
Aroclor 1232 -SPLP	ND	2	ug/L
Aroclor 1242 -SPLP	ND	2	ug/L
Aroclor 1248 -SPLP	ND	2	ug/L
Aroclor 1254 -SPLP	ND	2	ug/L
Aroclor 1260 -SPLP	ND	2	ug/L
Inorganics			
Aluminum -SPLP	173 B	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	4.2 B	10	ug/L
Barium -SPLP	11.8 B	200	ug/L
Beryllium -SPLP	0.17 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	51200	5000	ug/L
Chromium -SPLP	19.4	5	ug/L

Table B-9
BioGenesis Demonstration Project
"Processed" Raw Dredged Material
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching # 7 of 7

	SCOW MATERIAL LEACH		
Sample ID:	**#7**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/20/99		
Analysis Date:	8/3/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	2.9 B	50	ug/L
Copper -SPLP	27.4	25	ug/L
Iron -SPLP	25.5 B	100	ug/L
Lead -SPLP	ND	3	ug/L
Magnesium -SPLP	142 B	5000	ug/L
Manganese -SPLP	ND	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	1230 B	5000	ug/L
Selenium -SPLP	1.8 B	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	27700	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	26.3 B	50	ug/L
Zinc -SPLP	ND	20	ug/L
General Chemistry			
Total Organic Carbon	3.7	1	mg/L
Furans			
Total TCDF -SPLP	ND	2.8	pg/L
2,3,7,8-TCDF -SPLP	ND	2.8	pg/L
Total PeCDF -SPLP	ND	1.4	pg/L
1,2,3,7,8-PeCDF -SPLP	ND	0.89	pg/L
2,3,4,7,8-PeCDF -SPLP	ND	0.89	pg/L
Total HxCDF -SPLP	ND	2.5	pg/L
1,2,3,4,7,8-HxCDF -SPLP	ND	2.3	pg/L
1,2,3,6,7,8-HxCDF -SPLP	ND	2	pg/L
2,3,4,6,7,8-HxCDF -SPLP	ND	2.3	pg/L
1,2,3,4,7,8,9-HpCDF -SPLP	ND	0.59	pg/L
1,2,3,7,8,9-HxCDF -SPLP	ND	2.5	pg/L
Total HpCDF -SPLP	ND	0.92	pg/L
1,2,3,4,6,7,8-HpCDF -SPLP	ND	0.92	pg/L
OCDF -SPLP	ND	1.7	pg/L
Dioxins			
Total TCDD -SPLP	ND	1.1	pg/L
2,3,7,8-TCDD -SPLP	ND	1.1	pg/L
Total PeCDD -SPLP	ND	1.7	pg/L
1,2,3,7,8-PeCDD -SPLP	ND	1.7	pg/L
Total HxCDD -SPLP	ND	1.6	pg/L
1,2,3,4,7,8-HxCDD -SPLP	ND	1.6	pg/L
1,2,3,6,7,8-HxCDD -SPLP	ND	1.4	pg/L
1,2,3,7,8,9-HxCDD -SPLP	ND	1.4	pg/L
Total HpCDD -SPLP	ND	1.2	pg/L
1,2,3,4,6,7,8-HpCDD -SPLP	ND	1.2	pg/L
OCDD -SPLP	ND	14	pg/L

Table B-10

BioGenesis Demonstration Project
Decontaminated Sediment Analytical Data

Sample ID:	PSD-V1-SL-01				PSD-V1-SL-02				PSD-V1-SL-02-DUP				PSD-V2-SL-01				PSD-V3-SL-01			
Receiving Date	3/17/99				3/17/99				3/17/99				3/18/99				3/19/99			
Sample Date:	3/16/99				3/16/99				3/16/99				3/17/99				3/17/99			
Matrix	SOLID				SOLID				SOLID				SOLID				SOLID			
Volatile Organics																				
Extraction Date	3/24/99				3/24/99				3/24/99				3/24/99				3/24/99			
Analysis Date:	3/24/99				3/24/99				3/24/99				3/24/99				3/24/99			
Analyte	Result			LDL	Result			LDL	Result			LDL	Result			LDL	Result			LDL
Acetone	37	ug/kg	B		42	ug/kg			27	ug/kg	B		20	ug/kg			13	ug/kg	J	
Benzene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Bromodichloromethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Bromoform	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Bromomethane	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10
2-Butanone	10	ug/kg	J		9.3	ug/kg	J		8	ug/kg	J		5.7	ug/kg	J		3.5	ug/kg	J	
Carbon disulfide	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Carbon tetrachloride	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Chlorobenzene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Dibromochloromethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Chloroethane	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10
Chloroform	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Chloromethane	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10
1,1-Dichloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,2-Dichloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,1-Dichloroethene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,2-Dichloroethene (total)	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,2-Dichloropropane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
cis-1,3-Dichloropropene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
trans-1,3-Dichloropropene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Ethylbenzene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
2-Hexanone	ND	ug/kg		20	ND	ug/kg		20	ND	ug/kg		20	ND	ug/kg		20	ND	ug/kg		20
Methylene chloride	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
4-Methyl-2-pentanone	4.6	ug/kg	J		ND	ug/kg		20	4	ug/kg	J		ND	ug/kg		20	ND	ug/kg		20
Styrene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,1,2,2-Tetrachloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Tetrachloroethene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Toluene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,1,1-Trichloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,1,2-Trichloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Trichloroethene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Vinyl chloride	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10
Xylenes (total)	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5

Table B-10

BioGenesis Demonstration Project
Decontaminated Sediment Analytical Data

Sample ID:	PSD-V1-SL-01			PSD-V1-SL-02			PSD-V1-SL-02-DUP			PSD-V2-SL-01			PSD-V3-SL-01		
Receiving Date	3/17/99			3/17/99			3/17/99			3/18/99			3/19/99		
Sample Date:	3/16/99			3/16/99			3/16/99			3/17/99			3/17/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
PAHs															
Extraction Date:	3/19/99			3/22/99			4/2/99			3/24/99			3/24/99		
Analysis Date:	4/7/99			4/12/99			4/11/99			4/9/99			4/11/99		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Results		LDL
Acenaphthene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
Phenol	NA			ND ug/kg		1,600	NA			NA			NA		
Acenaphthylene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
Anthracene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
2-Chlorophenol	NA			ND ug/kg		1,600	NA			NA			NA		
Benzo(a)anthracene	1,900 ug/kg		1,700	1,800 ug/kg		1,600	1,400 ug/kg	J	1,600	1,500 ug/kg	J	1,700	1,400 ug/kg	J	1,700
Benzo(a)pyrene	2,100 ug/kg		1,700	1,900 ug/kg		1,600	1,500 ug/kg	J	1,600	1,400 ug/kg	J	1,700	1,400 ug/kg	J	1,700
Benzo(b)fluoranthene	1,800 ug/kg		1,700	1,600 ug/kg		1,600	1,200 ug/kg	J	1,600	1,200 ug/kg	J	1,700	1,200 ug/kg	J	1,700
N-Nitrosodi-n-propylamine	NA			ND ug/kg		1,600	NA			NA			NA		
Benzo(k)fluoranthene	1,500 ug/kg	J	1,700	1,500 ug/kg	J	1,600	1,200 ug/kg	J	1,600	1,200 ug/kg	J	1,700	1,100 ug/kg	J	1,700
1,2,4-Trichlorobenzene	NA			ND ug/kg		1,600	NA			NA			NA		
Benzo(ghi)perylene	580 ug/kg	J	1,700	1,000 ug/kg	J	1,600	560 ug/kg	J	1,600	1,100 ug/kg	J	1,700	1,100 ug/kg	J	1,700
4-Chloro-3-methylphenol	NA			ND ug/kg		1,600	NA			NA			NA		
4-Nitrophenol	NA			ND ug/kg		8,000	NA			NA			NA		
2,4-Dinitrotoluene	NA			ND ug/kg		1,600	NA			NA			NA		
Chrysene	2,100 ug/kg		1,700	1,900 ug/kg		1,600	1,600 ug/kg		1,600	1,700 ug/kg	J	1,700	1,500 ug/kg	J	1,700
Dibenz(a,h)anthracene	270 ug/kg	J	1,700	300 ug/kg	J	1,600	ND ug/kg		1,600	280 ug/kg	J	1,700	ND ug/kg		1,700
Dibenzofuran	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
1,2-Dichlorobenzene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
1,3-Dichlorobenzene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
1,4-Dichlorobenzene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
Fluoranthene	3,700 ug/kg		1,700	3,200 ug/kg		1,600	2,700 ug/kg		1,600	2,500 ug/kg		1,700	2,600 ug/kg		1,700
Fluorene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
Hexachlorobenzene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
Indeno(1,2,3-cd)pyrene	930 ug/kg	J	1,700	1,000 ug/kg	J	1,600	1,100 ug/kg	J	1,600	1,000 ug/kg	J	1,700	1,000 ug/kg	J	1,700
2-Methlynaphthalene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
Naphthalene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
Nitrobenzene	ND ug/kg		1,700	ND ug/kg		1,600	ND ug/kg		1,600	ND ug/kg		1,700	ND ug/kg		1,700
Pentachlorophenol	ND ug/kg		8,000	ND ug/kg		8,000	ND ug/kg		8,000	ND ug/kg		8,100	ND ug/kg		8,100
Phenanthrene	1,300 ug/kg	J	1,700	1,200 ug/kg	J	1,600	1,200 ug/kg	J	1,600	1,100 ug/kg	J	1,700	1,100 ug/kg	J	1,700
Pyrene	2,800 ug/kg		1,700	2,300 ug/kg		1,600	2,200 ug/kg		1,600	2,200 ug/kg		1,700	2,200 ug/kg		1,700

Table B-10

BioGenesis Demonstration Project
Decontaminated Sediment Analytical Data

Sample ID:	PSD-V1-SL-01			PSD-V1-SL-02			PSD-V1-SL-02-DUP			PSD-V2-SL-01			PSD-V3-SL-01		
Receiving Date	3/17/99			3/17/99			3/17/99			3/18/99			3/19/99		
Sample Date:	3/16/99			3/16/99			3/16/99			3/17/99			3/17/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
Herbicides															
Extraction Date	3/22/99			3/22/99			3/30/99			3/22/99			3/24/99		
Analysis Date:	4/9/99			4/9/99			4/8/99			4/9/99			4/12/99		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		D.L.
2,4-D	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20			
2,4,5-TP (Silvex)	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40			
2,4,5-T	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40			
Pesticides															
Extraction Date	3/22/99			3/22/99			3/23/99			3/23/99			3/24/99		
Analysis Date:	4/12/99			4/12/99			4/1/99			4/6/99			4/12/99		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		D.L.
alpha-BHC	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
beta-BHC	ND	ug/kg	3.4	ND	ug/kg	3.4	9.4	ug/kg		ND	ug/kg	3.4	ND	ug/kg	3.4
delta-BHC	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
gamma-BHC (Lindane)	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
Heptachlor	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
Aldrin	ND	ug/kg	3.4	ND	ug/kg	3.4	8.5	ug/kg		ND	ug/kg	3.4	ND	ug/kg	3.4
Heptachlor expoxide	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
Endosulfan I	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
Dieldrin	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
4,4' - DDE	18	ug/kg		18	ug/kg		24	ug/kg		22	ug/kg		21	ug/kg	
Endrin	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
Endrin ketone	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
Endrin aldehyde	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
Endosulfan II	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
4,4' - DDD	13	ug/kg		14	ug/kg		15	ug/kg		18	ug/kg		16	ug/kg	
Endosulfan sulfate	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
4,4' - DDT	8.1	ug/kg		13	ug/kg		27	ug/kg		13	ug/kg		11	ug/kg	
Methoxychlor	ND	ug/kg	34	ND	ug/kg	34	ND	ug/kg	85	ND	ug/kg	34	ND	ug/kg	34
alpha-Chlordane	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
gamma-Chlordane	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	3.4
Toxaphene	ND	ug/kg	130	ND	ug/kg	130	ND	ug/kg	330	ND	ug/kg	140	ND	ug/kg	130

Table B-10

BioGenesis Demonstration Project
Decontaminated Sediment Analytical Data

Sample ID:	PSD-V1-SL-01		PSD-V1-SL-02		PSD-V1-SL-02-DUP		PSD-V2-SL-01		PSD-V3-SL-01		
Receiving Date	3/17/99		3/17/99		3/17/99		3/18/99		3/19/99		
Sample Date:	3/16/99		3/16/99		3/16/99		3/17/99		3/17/99		
Matrix	SOLID		SOLID		SOLID		SOLID		SOLID		
PCBs											
Extraction Date:	3/22/99		3/22/99		3/23/99		3/23/99		3/24/99		
Analysis Date:	4/9/99		4/9/99		4/3/99		4/3/99		4/12/99		
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Results		LDL
Aroclor 1016	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg		33
Aroclor 1221	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg		33
Aroclor 1232	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg		33
Aroclor 1242	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg		33
Aroclor 1248	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg		33
Aroclor 1254	220 ug/kg	33	190 ug/kg	33	170 ug/kg	33	130 ug/kg	33	260 ug/kg		33
Aroclor 1260	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg		33
PCB High Resolution											
Receiving Date	NA		3/18/99		NA		3/18/99		3/20/99		
Sample Date	NA		3/16/99		NA		3/16/99		3/17/99		
Extraction Date	NA		3/22/99		NA		3/22/99		3/23/99		
Analysis Date:	NA		4/6/99		NA		4/6/99		4/18/99		
Analyte	NA		Result	DL	NA		Result	DL	Result		DL
2-MonoCB	NA		600 pg/g	40	NA		440 pg/g	40	340 pg/g		2.0
Total Monochlorobiphenyls	NA		1,400 pg/g	40	NA		1,100 pg/g	40	1,100 pg/g		2.0
4,4'-DiCB	NA		8,000 pg/g	40	NA		7,900 pg/g	40	7,400 pg/g	BE	2.0
Total Dichlorobiphenyls	NA		20,000 pg/g	40	NA		19,000 pg/g	40	21,000 pg/g		2.0
2,4,4'-TriCB	NA		9,700 pg/g	40	NA		17,000 pg/g	40	14,000 pg/g	E	2.0
Total Trichlorobiphenyls	NA		44,000 pg/g	40	NA		63,000 pg/g	40	49,000 pg/g		2.0
2,2',5,5'-TetraCB	NA		7,500 pg/g	40	NA		8,300 pg/g	40	7,000 pg/g	BE	2.0
3,3',4,4'-TetraCB (#77)	NA		2,300 pg/g	40	NA		2,500 pg/g	40	2,400 pg/g	E	2.0
Total Tetrachlorobiphenyls	NA		58,000 pg/g	40	NA		54,000 pg/g	40	48,000 pg/g		2.0
2,3,3',4,4'-PentaCB (#105)	NA		3,700 pg/g	40	NA		4,000 pg/g	40	3,600 pg/g	E	2.0
2,3',4,4',5-PentaCB (#118)	NA		6,000 pg/g	40	NA		6,700 pg/g	40	7,400 pg/g	EB	2.0
3,3',4,4',5-Penta CB (#126)	NA		53 pg/g	40	NA		58 pg/g	40	39 pg/g		2.0
Total Pentachlorobiphenyls	NA		42,000 pg/g	40	NA		46,000 pg/g	40	41,000 pg/g		2.0
2,3,3',4,4',5-Hexa CB (#156)	NA		650 pg/g	40	NA		760 pg/g	40	690 pg/g		2.0
3,3',4,4',5,5'-HexaCB (#169)	NA		ND pg/g	40	NA		ND pg/g	40	2.8 pg/g		2.0
Total Hexachlorobiphenyls	NA		22,000 pg/g	40	NA		27,000 pg/g	40	26,000 pg/g		2.0
2,2',3,4,4',5,5'-HeptaCB (#180)	NA		5,100 pg/g	40	NA		5,400 pg/g	40	5,200 pg/g	EB	2.0
Total Heptachlorobiphenyls	NA		19,000 pg/g	40	NA		19,000 pg/g	40	19,000 pg/g		2.0
2,2',3,3',4,4',5,5'-OctaCB	NA		1,200 pg/g	40	NA		1,300 pg/g	40	1,300 pg/g		2.0
Total Octachlorobiphenyls	NA		3,700 pg/g	40	NA		4,800 pg/g	40	3,800 pg/g		2.0
2,2',3,3',4,4',5,5',6-NonaCB	NA		780 pg/g	40	NA		1,300 pg/g	40	1,100 pg/g		2.0
Total Nonachlorobiphenyls	NA		810 pg/g	40	NA		1,600 pg/g	40	1,400 pg/g		2.0
DecaCB	NA		800 pg/g	40	NA		930 pg/g	40	1,000 pg/g		2.0
TOTAL PCB VALUE (Calculated)	NA		**514,586 pg/g**		NA		**584,176 pg/g**		**523,544 pg/g**		

Table B-10

BioGenesis Demonstration Project
Decontaminated Sediment Analytical Data

Sample ID:	PSD-V1-SL-01			PSD-V1-SL-02			PSD-V1-SL-02-DUP			PSD-V2-SL-01			PSD-V3-SL-01		
Receiving Date	3/17/99			3/17/99			3/17/99			3/18/99			3/19/99		
Sample Date:	3/16/99			3/16/99			3/16/99			3/17/99			3/17/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
Priority Pollutant Metals															
Extraction Date:	4/1/99			3/25/99			3/25/99			3/25/99			4/1/99		
Analysis Date:	4/6/99			3/29/99			3/29/99			3/29/99			4/6/99		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Results		LDL
Antimony	0.09 mg/kg	B	0.14	ND mg/kg		0.14	ND mg/kg		0.14	0.067 mg/kg		0.14	0.085 mg/kg	B	0.15
Arsenic	8.4 mg/kg		0.72	8.6 mg/kg		0.71	8.1 mg/kg		0.71	6.7 mg/kg		0.7	8.4 mg/kg		0.74
Beryllium	0.4 mg/kg		0.14	0.53 mg/kg		0.14	0.48 mg/kg		0.14	0.41 mg/kg		0.14	0.42 mg/kg		0.15
Cadmium	1.3 mg/kg		0.14	1.3 mg/kg		0.14	1.2 mg/kg		0.14	1.1 mg/kg		0.14	1.3 mg/kg		0.15
Chromium	47.9 mg/kg		0.14	62.4 mg/kg		0.14	60.2 mg/kg		0.14	49 mg/kg		0.14	51.6 mg/kg		0.15
Copper	58.4 mg/kg		0.14	62 mg/kg		0.14	58.5 mg/kg		0.14	49.5 mg/kg		0.14	62 mg/kg		0.15
Lead	71.1 mg/kg		0.72	70.1 mg/kg		0.14	66.7 mg/kg		0.14	57.2 mg/kg		0.14	75.5 mg/kg		0.74
Nickel	25.7 mg/kg		0.14	28.4 mg/kg		0.14	26.8 mg/kg		0.14	22.6 mg/kg		0.14	25.5 mg/kg		0.15
Selenium	0.48 mg/kg	B	0.72	0.51 mg/kg	B	0.71	0.49 mg/kg	B	0.71	0.45 mg/kg	B	0.7	0.49 mg/kg	B	0.74
Silver	0.96 mg/kg		0.14	1.1 mg/kg		0.14	1 mg/kg		0.14	0.83 mg/kg		0.14	1 mg/kg		0.15
Thallium	0.2 mg/kg		0.14	0.21 mg/kg		0.14	0.2 mg/kg		0.14	0.17 mg/kg		0.14	0.21 mg/kg		0.15
Zinc	134 mg/kg		1.4	135 mg/kg		1.4	129 mg/kg		1.4	106 mg/kg		1.4	152 mg/kg		1.5
Mercury	0.42 mg/kg		0.047	0.27 mg/kg		0.24	1.6 mg/kg		0.24	0.26 mg/kg		0.23	0.21 mg/kg		0.049
Extraction Date:	3/24/99			3/24/99			4/7/99			3/24/99			3/24/99		
Analysis Date:	4/7/99			4/7/99			4/8/99			4/7/99			4/7/99		
General Chemistry															
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Results		LDL
Percent Solids	69.9 %		1	69.0 %		1	69.9 %			71.8 %		1	67.8 %		
Receiving Date	3/17/99			3/17/99			3/17/99			3/18/99			3/19/99		
Extraction Date:	3/17/99			3/17/99			3/22/99			3/19/99			3/22/99		
Analysis Date:	3/18/99			3/18/99			3/23/99			3/20/99			3/23/99		
Percent Solids	NA			70.2 %			70.0 %			NA			66.6 %		
Receiving Date				3/18/99			3/18/99						3/18/99		
Extraction Date:				3/22/99			3/22/99						3/23/99		
Analysis Date:				3/23/99			3/23/99						3/24/99		
pH (solid)	7.6 No Uni			7.6 No Uni			7.7 No Uni			7.6 No Uni			7.7 No Uni		
Receiving Date	3/17/99			3/17/99			4/2/99			3/18/99			3/18/99		
Extraction Date:	3/17/99			3/17/99			4/2/99			3/19/99			3/18/99		
Analysis Date:										36238			3/18/99		
Total Organic Carbon	12,400 mg/kg		125	12,000 mg/kg		107	13,600 mg/kg		120	7,510 mg/kg		79	13600 mg/kg		114
Extraction Date:	4/7/99			4/7/99			4/7/99			4/8/99			4/8/99		
Analysis Date:	4/7/99			4/7/99			4/7/99			4/8/99			4/8/99		
Acid-insoluble Sulfide	ND mg/kg		71.6	ND mg/kg		72.5	ND mg/kg		71.5	ND mg/kg		69.6	ND mg/kg		75.1
Extraction Date:	3/23/99			3/23/99			3/23/99			3/22/99			3/22/99		
Analysis Date:	3/23/99			3/23/99			3/23/99			3/22/99			3/22/99		

Tab B-10 (con't)

BioGenesis Demonstration Project
Decontaminated Sediment Analytical Data

Sample ID:	PSD-V1-SL-01	PSD-V1-SL-02		PSD-V1-SL-02-DUP	PSD-V2-SL-01		PSD-V3-SL-01	
Receiving Date	NA	3/18/99		NA	3/18/99		3/20/99	
Sample Date	NA	3/16/99		NA	3/16/99		3/17/99	
Extraction Date	NA	3/23/99		NA	3/23/99		3/23/99	
Analysis Date:	NA	4/1/99		NA	4/1/99		4/25/99	
Matrix	NA	Solid		NA	Solid		Solid	
Analyte	NA	Result	DL	NA	Result	DL	Result	DL
Furans								
TCDFs (total)	NA	210 pg/g		NA	200 pg/g		210 pg/g	
2,3,7,8-TCDF	NA	9.5 pg/g g		NA	9.2 pg/g		9.6 pg/g	
PeCDFs (total)	NA	230 pg/g		NA	170 pg/g		180 pg/g	
1,2,3,7,8-PeCDF	NA	6.9 pg/g		NA	5.5 pg/g		5.6 pg/g	
2,3,4,7,8-PeCDF	NA	17 pg/g		NA	11 pg/g		11 pg/g	
HxCDFs (total)	NA	250 pg/g		NA	160 pg/g		170 pg/g	
1,2,3,4,7,8-HxCDF	NA	160 pg/g		NA	58 pg/g		61 pg/g	
1,2,3,6,7,8-HxCDF	NA	24 pg/g		NA	12 pg/g		13 pg/g	
2,3,4,6,7,8-HxCDF	NA	8.9 pg/g		NA	5.1 pg/g		3.9 pg/g	
1,2,3,7,8,9-HxCDF	NA	ND pg/g	0.34	NA	ND pg/g	0.21	ND pg/g	0.93
HpCDFs (total)	NA	560 pg/g		NA	250 pg/g		270 pg/g	
1,2,3,4,6,7,8-HpCDF	NA	450 pg/g		NA	180 pg/g		190 pg/g	
1,2,3,4,7,8,9-HpCDF	NA	19 pg/g		NA	7.4 pg/g		8.3 pg/g	
OCDF	NA	770 pg/g		NA	280 pg/g		320 pg/g	
Dioxins								
TCDDs (total)	NA	84 pg/g		NA	74 pg/g		72 pg/g	
2,3,7,8-TCDD	NA	64 pg/g		NA	56 pg/g		50 pg/g	
PeCDDs (total)	NA	12 pg/g		NA	7.9 pg/g		10 pg/g	
1,2,3,7,8-PeCDD	NA	ND pg/g	1.8	NA	ND pg/g	1.5	ND pg/g	1.6
HxCDDs (total)	NA	94 pg/g		NA	92 pg/g		87 pg/g	
1,2,3,4,7,8-HxCDD	NA	ND pg/g	2.4	NA	ND pg/g	2.3	ND pg/g	1.6
1,2,3,6,7,8-HxCDD	NA	8.8 pg/g		NA	8.8 pg/g		7.6 pg/g	
1,2,3,7,8,9-HxCDD	NA	7.4 pg/g		NA	7.2 pg/g		6 pg/g	
HpCDDs (total)	NA	250 pg/g		NA	260 pg/g		280 pg/g	
1,2,3,4,6,7,8-HpCDD	NA	100 pg/g		NA	100 pg/g		110 pg/g	
OCDD	NA	850 pg/g		NA	810 pg/g		920 pg/g	
TEQ (Calculated)	NA	**102.02 pg/g**		NA	**75.77 pg/g**		**70.21 pg/g**	

Table B-11
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)

Sample ID:	**HOPPER MATERIAL**		
Receiving Date:	62599		
Sample Date:	62499		
Extraction Date:	70199		
Analysis Date:	72199		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene	ND	1100	ug/kg
Acenaphthylene	ND	1100	ug/kg
Anthracene	ND	1100	ug/kg
Benzo(a)anthracene	1100	1100	ug/kg
Benzo(a)pyrene	930 J	1100	ug/kg
Benzo(b)fluoranthene	960 J	1100	ug/kg
Benzo(k)fluoranthene	1500	1100	ug/kg
Benzo(ghi)perylene	700 J	1100	ug/kg
bis(2-Chloroethoxy)methane	ND	1100	ug/kg
bis(2-Chloroethyl) ether	ND	1100	ug/kg
bis(2-Ethylhexyl) phthalate	9100	1100	ug/kg
4-Bromophenyl phenyl ether	ND	1100	ug/kg
Butyl benzyl phthalate	ND	1100	ug/kg
Carbazole	ND	1100	ug/kg
4-Chloro-3-methylphenol	ND	1100	ug/kg
4-Chloroaniline	ND	1100	ug/kg
2-Chloronaphthalene	ND	1100	ug/kg
2-Chlorophenol	ND	1100	ug/kg
4-Chlorophenyl phenyl ether	ND	1100	ug/kg
Chrysene	1400	1100	ug/kg
Dibenz(a,h)anthracene	270 J	1100	ug/kg
Dibenzofuran	ND	1100	ug/kg
1,2-Dichlorobenzene	ND	1100	ug/kg
1,3-Dichlorobenzene	ND	1100	ug/kg
1,4-Dichlorobenzene	ND	1100	ug/kg
3,3'-Dichlorobenzidine	ND	5500	ug/kg
2,4-Dichlorophenol	ND	1100	ug/kg
Di-n-butyl phthalate	ND	1100	ug/kg
Di-n-octyl phthalate	ND	1100	ug/kg
Diethyl phthalate	ND	1100	ug/kg
2,4-Dimethylphenol	ND	1100	ug/kg
Dimethyl phthalate	ND	1100	ug/kg
4,6-Dinitro-2-methylphenol	ND	5500	ug/kg
2,4-Dinitrophenol	ND	5500	ug/kg
2,4-Dinitrotoluene	ND	1100	ug/kg
2,6-Dinitrotoluene	ND	1100	ug/kg
Fluoranthene	2100	1100	ug/kg
Fluorene	ND	1100	ug/kg
Hexachlorobenzene	ND	1100	ug/kg
Hexachlorobutadiene	ND	1100	ug/kg
Hexachlorocyclopentadiene	ND	5500	ug/kg
Hexachloroethane	ND	1100	ug/kg
Indeno(1,2,3-cd)pyrene	700 J	1100	ug/kg
Isophorone	ND	1100	ug/kg
2-Methylnaphthalene	ND	1100	ug/kg
2-Methylphenol	ND	1100	ug/kg
3-Methylphenol & 4-Methylpheno	ND	1100	ug/kg
2-Nitroaniline	ND	5500	ug/kg
3-Nitroaniline	ND	5500	ug/kg
4-Nitroaniline	ND	5500	ug/kg
2-Nitrophenol	ND	1100	ug/kg
4-Nitrophenol	ND	5500	ug/kg
N-Nitrosodi-n-propylamine	ND	1100	ug/kg
N-Nitrosodiphenylamine	ND	1100	ug/kg

Table B-11
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)

Sample ID:	**HOPPER MATERIAL**		
Receiving Date:	62599		
Sample Date:	62499		
Extraction Date:	70199		
Analysis Date:	72199		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene	ND	1100	ug/kg
Nitrobenzene	ND	1100	ug/kg
2,2'-oxybis(1-Chloropropane)	ND	1100	ug/kg
Pentachlorophenol	ND	5500	ug/kg
Phenanthrene	ND	1100	ug/kg
Phenol	ND	1100	ug/kg
Pyrene	1700	1100	ug/kg
1,2,4-Trichlorobenzene	ND	1100	ug/kg
2,4,5-Trichlorophenol	ND	1100	ug/kg
2,4,6-Trichlorophenol	ND	1100	ug/kg
Herbicides			
2,4-D	ND	28	ug/kg
2,4,5-TP (Silvex)	ND	55	ug/kg
2,4,5-T	ND	55	ug/kg
Pesticides			
alpha-BHC	ND	2.3	ug/kg
beta-BHC	ND	2.3	ug/kg
delta-BHC	ND	2.3	ug/kg
gamma-BHC (Lindane)	ND	2.3	ug/kg
Heptachlor	ND	2.3	ug/kg
Aldrin	ND	2.3	ug/kg
Heptachlor epoxide	ND	2.3	ug/kg
Endosulfan I	ND	2.3	ug/kg
Dieldrin	ND	2.3	ug/kg
4,4'-DDE	ND	2.3	ug/kg
Endrin	ND	2.3	ug/kg
Endrin ketone	ND	2.3	ug/kg
Endrin aldehyde	ND	2.3	ug/kg
Endosulfan II	ND	2.3	ug/kg
4,4'-DDD	2.3	2.3	ug/kg
Endosulfan sulfate	ND	2.3	ug/kg
4,4'-DDT	3.2	2.3	ug/kg
Methoxychlor	ND	23	ug/kg
alpha-Chlordane	ND	2.3	ug/kg
gamma-Chlordane	ND	2.3	ug/kg
Toxaphene	ND	92	ug/kg
PCBs			
Aroclor 1016	ND	45	ug/kg
Aroclor 1221	ND	45	ug/kg
Aroclor 1232	ND	45	ug/kg
Aroclor 1242	ND	45	ug/kg
Aroclor 1248	ND	45	ug/kg
Aroclor 1254	ND	45	ug/kg
Aroclor 1260	ND	45	ug/kg
Inorganics			
Aluminum	6780	27.5	mg/kg
Antimony	0.61 BN	1.4	mg/kg
Arsenic	10.5	1.4	mg/kg
Barium	112	27.5	mg/kg
Beryllium	0.45 B	0.69	mg/kg
Cadmium	0.97	0.28	mg/kg
Calcium	9910	688	mg/kg
Chromium	59	0.69	mg/kg

Table B-11
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)

Sample ID:	**HOPPER MATERIAL**		
Receiving Date:	62599		
Sample Date:	62499		
Extraction Date:	70199		
Analysis Date:	72199		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt	10.4	6.9	mg/kg
Copper	63.1	3.4	mg/kg
Iron	24300	13.8	mg/kg
Lead	74.8	0.41	mg/kg
Magnesium	5780	688	mg/kg
Manganese	465	2.1	mg/kg
Mercury	1.6	0.14	mg/kg
Nickel	26.6	5.5	mg/kg
Potassium	1390	688	mg/kg
Selenium	0.58 B	0.69	mg/kg
Silver	1.2	0.69	mg/kg
Sodium	2970	688	mg/kg
Thallium	1.3 B	1.4	mg/kg
Total Cyanide	ND	3.4	mg/kg
Vanadium	22.1	6.9	mg/kg
Zinc	152	2.8	mg/kg
General Chemistry			
Percent Solids	72.7		%
Total Organic Carbon	16000	68.8	mg/kg
Furans			
Total TCDF	650		pg/g
2,3,7,8-TCDF	27 CON		pg/g
Total PeCDF	490		pg/g
1,2,3,7,8-PeCDF	17		pg/g
2,3,4,7,8-PeCDF	30		pg/g
Total HxCDF	490		pg/g
1,2,3,4,7,8-HxCDF	180		pg/g
1,2,3,6,7,8-HxCDF	37		pg/g
2,3,4,6,7,8-HxCDF	17		pg/g
1,2,3,4,7,8,9-HpCDF	26		pg/g
1,2,3,7,8,9-HxCDF	ND	1.1	pg/g
Total HpCDF	840		pg/g
1,2,3,4,6,7,8-HpCDF	610		pg/g
OCDF	900		pg/g
Dioxins			
Total TCDD	210		pg/g
2,3,7,8-TCDD	140		pg/g
Total PeCDD	47		pg/g
1,2,3,7,8-PeCDD	5.3 J		pg/g
Total HxCDD	240		pg/g
1,2,3,4,7,8-HxCDD	6.0 J		pg/g
1,2,3,6,7,8-HxCDD	24		pg/g
1,2,3,7,8,9-HxCDD	18		pg/g
Total HpCDD	810		pg/g
1,2,3,4,6,7,8-HpCDD	310		pg/g
OCDD	2500		pg/g

Table B-12
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #1 of 7

Sample ID:	**HOPPER MATERIAL LEACH #1**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/8/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -S	0.0042 J	0.01	mg/L
4-Bromophenyl phenyl ether -SP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -S	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.05	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.05	mg/L
2,4-Dinitrophenol -SPLP	ND	0.05	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPL	ND	0.05	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylpheno	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.05	mg/L
3-Nitroaniline -SPLP	ND	0.05	mg/L
4-Nitroaniline -SPLP	ND	0.05	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.05	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-12
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #1 of 7

	HOPPER MATERIAL		
Sample ID:	**LEACH #1**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/8/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.05	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.008	mg/L
2,4-DB -SPLP	ND	0.008	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.002	mg/L
2,4,5-T -SPLP	ND	0.002	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.1	ug/L
beta-BHC -SPLP	ND	0.1	ug/L
delta-BHC -SPLP	ND	0.1	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.1	ug/L
Heptachlor -SPLP	ND	0.1	ug/L
Aldrin -SPLP	ND	0.1	ug/L
Heptachlor epoxide -SPLP	ND	0.1	ug/L
Endosulfan I -SPLP	ND	0.1	ug/L
Dieldrin -SPLP	ND	0.1	ug/L
4,4'-DDE -SPLP	ND	0.1	ug/L
Endrin -SPLP	ND	0.1	ug/L
Endrin ketone -SPLP	ND	0.1	ug/L
Endrin aldehyde -SPLP	ND	0.1	ug/L
Endosulfan II -SPLP	ND	0.1	ug/L
4,4'-DDD -SPLP	ND	0.1	ug/L
Endosulfan sulfate -SPLP	ND	0.1	ug/L
4,4'-DDT -SPLP	ND	0.1	ug/L
Methoxychlor -SPLP	ND	1	ug/L
alpha-Chlordane -SPLP	ND	0.1	ug/L
gamma-Chlordane -SPLP	ND	0.1	ug/L
Toxaphene -SPLP	ND	4	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	2	ug/L
Aroclor 1221 -SPLP	ND	2	ug/L
Aroclor 1232 -SPLP	ND	2	ug/L
Aroclor 1242 -SPLP	ND	2	ug/L
Aroclor 1248 -SPLP	ND	2	ug/L
Aroclor 1254 -SPLP	ND	2	ug/L
Aroclor 1260 -SPLP	ND	2	ug/L
Inorganics			
Aluminum -SPLP	244	200	ug/L
Antimony -SPLP	4.3 B	10	ug/L
Arsenic -SPLP	8.6 B	10	ug/L
Barium -SPLP	22.1 B	200	ug/L
Beryllium -SPLP	0.18 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	21800	5000	ug/L
Chromium -SPLP	3.3 B	5	ug/L

Table B-12
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #1 of 7

	HOPPER MATERIAL		
Sample ID:	**LEACH #1**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/8/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics			
Cobalt -SPLP	4.2 B	50	ug/L
Copper -SPLP	7.0 B	25	ug/L
Iron -SPLP	159	100	ug/L
Lead -SPLP	1.8 B	3	ug/L
Magnesium -SPLP	12300	5000	ug/L
Manganese -SPLP	25.2	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	6520	5000	ug/L
Selenium -SPLP	5.7	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	95400	5000	ug/L
Thallium -SPLP	3.7 B	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	10.5 B	50	ug/L
Zinc -SPLP	11.8 B	20	ug/L
General Chemistry			
Total Organic Carbon	3.7	1	mg/L
Furans			
Total TCDF -SPLP	ND	2.2	pg/L
2,3,7,8-TCDF -SPLP	ND	2.2	pg/L
Total PeCDF -SPLP	ND	3.3	pg/L
1,2,3,7,8-PeCDF -SPLP	ND	3.3	pg/L
2,3,4,7,8-PeCDF-SPLP	ND	3.2	pg/L
Total HxCDF -SPLP	ND	3.5	pg/L
1,2,3,4,7,8-HxCDF -SPLP	ND	3.1	pg/L
1,2,3,6,7,8-HxCDF -SPLP	ND	2.3	pg/L
2,3,4,6,7,8-HxCDF -SPLP	ND	3	pg/L
1,2,3,4,7,8,9-HpCDF -SPLP	ND	1.8	pg/L
1,2,3,7,8,9-HxCDF -SPLP	ND	3.5	pg/L
Total HpCDF -SPLP	ND	3.4	pg/L
1,2,3,4,6,7,8-HpCDF -SPLP	ND	3.4	pg/L
OCDF -SPLP	ND	5.3	pg/L
Dioxins			
Total TCDD -SPLP	ND	5	pg/L
2,3,7,8-TCDD -SPLP	ND	5	pg/L
Total PeCDD -SPLP	ND	4.2	pg/L
1,2,3,7,8-PeCDD -SPLP	ND	4.2	pg/L
Total HxCDD -SPLP	ND	2.5	pg/L
1,2,3,4,7,8-HxCDD -SPLP	ND	2.5	pg/L
1,2,3,6,7,8-HxCDD -SPLP	ND	2.1	pg/L
1,2,3,7,8,9-HxCDD -SPLP	ND	2.1	pg/L
Total HpCDD -SPLP	ND	1.8	pg/L
1,2,3,4,6,7,8-HpCDD -SPLP	ND	1.8	pg/L
OCDD -SPLP	ND	19	pg/L

Table B-13
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching # 2 of 7

Sample ID:	**HOPPER MATERIAL LEACH #2**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -S	ND	0.01	mg/L
4-Bromophenyl phenyl ether -SP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -S	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.05	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.05	mg/L
2,4-Dinitrophenol -SPLP	ND	0.05	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.05	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.05	mg/L
3-Nitroaniline -SPLP	ND	0.05	mg/L
4-Nitroaniline -SPLP	ND	0.05	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.05	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-13
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching # 2 of 7

Sample ID:	**HOPPER MATERIAL LEACH #2**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.05	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -SPLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.001	mg/L
2,4,5-T -SPLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	1010	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	8.6 B	10	ug/L
Barium -SPLP	11.8 B	200	ug/L
Beryllium -SPLP	0.12 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	6200	5000	ug/L
Chromium -SPLP	9.2	5	ug/L

Table B-13
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching # 2 of 7

Sample ID:	**HOPPER MATERIAL LEACH #2**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	3.6 B	50	ug/L
Copper -SPLP	10.3 B	25	ug/L
Iron -SPLP	1030	100	ug/L
Lead -SPLP	6.4	3	ug/L
Magnesium -SPLP	2710 B	5000	ug/L
Manganese -SPLP	12.5 B	15	ug/L
Mercury -SPLP	0.12 B	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	1260 B	5000	ug/L
Selenium -SPLP	1.8 B	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	17700	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	16.6 B	50	ug/L
Zinc -SPLP	15.2 B	20	ug/L
General Chemistry			
Total Organic Carbon	1.8	1	mg/L

Table B-14
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #3 of 7

Sample ID:	**HOPPER MATERIAL LEACH #3**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.011	mg/L
Acenaphthylene -SPLP	ND	0.011	mg/L
Anthracene -SPLP	ND	0.011	mg/L
Benzo(a)anthracene -SPLP	ND	0.011	mg/L
Benzo(a)pyrene -SPLP	ND	0.011	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.011	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.011	mg/L
Benzo(ghi)perylene -SPLP	ND	0.011	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.011	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.011	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	0.0048 J	0.011	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.011	mg/L
Butyl benzyl phthalate -SPLP	ND	0.011	mg/L
Carbazole -SPLP	ND	0.011	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.011	mg/L
4-Chloroaniline -SPLP	ND	0.011	mg/L
2-Chloronaphthalene -SPLP	ND	0.011	mg/L
2-Chlorophenol -SPLP	ND	0.011	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.011	mg/L
Chrysene -SPLP	ND	0.011	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.011	mg/L
Dibenzofuran -SPLP	ND	0.011	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.011	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.011	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.011	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.053	mg/L
2,4-Dichlorophenol -SPLP	ND	0.011	mg/L
Di-n-butyl phthalate -SPLP	0.0013 J	0.011	mg/L
Di-n-octyl phthalate -SPLP	ND	0.011	mg/L
Diethyl phthalate -SPLP	ND	0.011	mg/L
2,4-Dimethylphenol -SPLP	ND	0.011	mg/L
Dimethyl phthalate -SPLP	ND	0.011	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.053	mg/L
2,4-Dinitrophenol -SPLP	ND	0.053	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.011	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.011	mg/L
Fluoranthene -SPLP	ND	0.011	mg/L
Fluorene -SPLP	ND	0.011	mg/L
Hexachlorobenzene -SPLP	ND	0.011	mg/L
Hexachlorobutadiene -SPLP	ND	0.011	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.053	mg/L
Hexachloroethane -SPLP	ND	0.011	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.011	mg/L
Isophorone -SPLP	ND	0.011	mg/L
2-Methylnaphthalene -SPLP	ND	0.011	mg/L
2-Methylphenol -SPLP	ND	0.011	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.011	mg/L
2-Nitroaniline -SPLP	ND	0.053	mg/L
3-Nitroaniline -SPLP	ND	0.053	mg/L
4-Nitroaniline -SPLP	ND	0.053	mg/L
2-Nitrophenol -SPLP	ND	0.011	mg/L
4-Nitrophenol -SPLP	ND	0.053	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.011	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.011	mg/L

Table B-14
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #3 of 7

Sample ID:	**HOPPER MATERIAL LEACH #3**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.011	mg/L
Nitrobenzene -SPLP	ND	0.011	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.011	mg/L
Pentachlorophenol -SPLP	ND	0.053	mg/L
Phenanthrene -SPLP	ND	0.011	mg/L
Phenol -SPLP	ND	0.011	mg/L
Pyrene -SPLP	ND	0.011	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.011	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.011	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.011	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -SPLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.001	mg/L
2,4,5-T -SPLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	776	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	17.7	10	ug/L
Barium -SPLP	8.2 B	200	ug/L
Beryllium -SPLP	0.13 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	3370 B	5000	ug/L
Chromium -SPLP	7.9	5	ug/L

Table B-14
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #3 of 7

Sample ID:	**HOPPER MATERIAL LEACH #3**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/12/99		
Analysis Date:	7/19/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	2.3 B	50	ug/L
Copper -SPLP	11.2 B	25	ug/L
Iron -SPLP	851	100	ug/L
Lead -SPLP	5.4	3	ug/L
Magnesium -SPLP	1260 B	5000	ug/L
Manganese -SPLP	10.2 B	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	877 B	5000	ug/L
Selenium -SPLP	ND	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	14500	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	32.6 B	50	ug/L
Zinc -SPLP	10.5 B	20	ug/L
General Chemistry			
Total Organic Carbon	1.7	1	mg/L

Table B-15
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #4 of 7

Sample ID:	**HOPPER MATERIAL LEACH #4**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/14/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	0.0047 J	0.01	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.05	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.05	mg/L
2,4-Dinitrophenol -SPLP	ND	0.05	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.05	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.05	mg/L
3-Nitroaniline -SPLP	ND	0.05	mg/L
4-Nitroaniline -SPLP	ND	0.05	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.05	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-15
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #4 of 7

Sample ID:	**HOPPER MATERIAL LEACH #4**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/14/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.05	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -TCLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -TCLP	ND	0.001	mg/L
2,4,5-T -TCLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	1670	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	12.4	10	ug/L
Barium -SPLP	14.8 B	200	ug/L
Beryllium -SPLP	0.23 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	3590 B	5000	ug/L
Chromium -SPLP	15.1	5	ug/L

Table B-15
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #4 of 7

Sample ID:	**HOPPER MATERIAL LEACH #4**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/14/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	2.3 B	50	ug/L
Copper -SPLP	14.8 B	25	ug/L
Iron -SPLP	1860	100	ug/L
Lead -SPLP	11.8	3	ug/L
Magnesium -SPLP	1370 B	5000	ug/L
Manganese -SPLP	23	15	ug/L
Mercury -SPLP	ND	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	883 B	5000	ug/L
Selenium -SPLP	ND	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	13600	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	25.2 B	50	ug/L
Zinc -SPLP	24.2	20	ug/L
General Chemistry			
Total Organic Carbon	1.6	1	mg/L

Table B-16
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #5 of 7

	HOPPER MATERIAL		
Sample ID:	**LEACH #5**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/16/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.011	mg/L
Acenaphthylene -SPLP	ND	0.011	mg/L
Anthracene -SPLP	ND	0.011	mg/L
Benzo(a)anthracene -SPLP	ND	0.011	mg/L
Benzo(a)pyrene -SPLP	ND	0.011	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.011	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.011	mg/L
Benzo(ghi)perylene -SPLP	ND	0.011	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.011	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.011	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	0.0044 J	0.011	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.011	mg/L
Butyl benzyl phthalate -SPLP	ND	0.011	mg/L
Carbazole -SPLP	ND	0.011	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.011	mg/L
4-Chloroaniline -SPLP	ND	0.011	mg/L
2-Chloronaphthalene -SPLP	ND	0.011	mg/L
2-Chlorophenol -SPLP	ND	0.011	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.011	mg/L
Chrysene -SPLP	ND	0.011	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.011	mg/L
Dibenzofuran -SPLP	ND	0.011	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.011	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.011	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.011	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.053	mg/L
2,4-Dichlorophenol -SPLP	ND	0.011	mg/L
Di-n-butyl phthalate -SPLP	ND	0.011	mg/L
Di-n-octyl phthalate -SPLP	ND	0.011	mg/L
Diethyl phthalate -SPLP	ND	0.011	mg/L
2,4-Dimethylphenol -SPLP	ND	0.011	mg/L
Dimethyl phthalate -SPLP	ND	0.011	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.053	mg/L
2,4-Dinitrophenol -SPLP	ND	0.053	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.011	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.011	mg/L
Fluoranthene -SPLP	ND	0.011	mg/L
Fluorene -SPLP	ND	0.011	mg/L
Hexachlorobenzene -SPLP	ND	0.011	mg/L
Hexachlorobutadiene -SPLP	ND	0.011	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.053	mg/L
Hexachloroethane -SPLP	ND	0.011	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.011	mg/L
Isophorone -SPLP	ND	0.011	mg/L
2-Methylnaphthalene -SPLP	ND	0.011	mg/L
2-Methylphenol -SPLP	ND	0.011	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.011	mg/L
2-Nitroaniline -SPLP	ND	0.053	mg/L
3-Nitroaniline -SPLP	ND	0.053	mg/L
4-Nitroaniline -SPLP	ND	0.053	mg/L
2-Nitrophenol -SPLP	ND	0.011	mg/L
4-Nitrophenol -SPLP	ND	0.053	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.011	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.011	mg/L

Table B-16
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #5 of 7

	HOPPER MATERIAL		
Sample ID:	**LEACH #5**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/16/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.011	mg/L
Nitrobenzene -SPLP	ND	0.011	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.011	mg/L
Pentachlorophenol -SPLP	ND	0.053	mg/L
Phenanthrene -SPLP	ND	0.011	mg/L
Phenol -SPLP	ND	0.011	mg/L
Pyrene -SPLP	ND	0.011	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.011	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.011	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.011	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -SPLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.001	mg/L
2,4,5-T -SPLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	1910	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	14.6	10	ug/L
Barium -SPLP	16.4 B	200	ug/L
Beryllium -SPLP	0.19 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	2960 B	5000	ug/L
Chromium -SPLP	17.6	5	ug/L

Table B-16
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #5 of 7

	HOPPER MATERIAL		
Sample ID:	**LEACH #5**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/16/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	1.8 B	50	ug/L
Copper -SPLP	18.3 B	25	ug/L
Iron -SPLP	2190	100	ug/L
Lead -SPLP	14.2	3	ug/L
Magnesium -SPLP	1150 B	5000	ug/L
Manganese -SPLP	27.8	15	ug/L
Mercury -SPLP	0.22	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	582 B	5000	ug/L
Selenium -SPLP	1.5 B	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	20600	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	28.1 B	50	ug/L
Zinc -SPLP	24.2	20	ug/L
General Chemistry			
Total Organic Carbon	1.7	1	mg/L

Table B-17
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #6 of 7

	HOPPER MATERIAL LEACH		
Sample ID:	**#6**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/19/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	0.0057 J	0.01	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.051	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.051	mg/L
2,4-Dinitrophenol -SPLP	ND	0.051	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.051	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.051	mg/L
3-Nitroaniline -SPLP	ND	0.051	mg/L
4-Nitroaniline -SPLP	ND	0.051	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.051	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-17
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #6 of 7

	HOPPER MATERIAL LEACH		
Sample ID:	**#6**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/19/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.051	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.004	mg/L
2,4-DB -SPLP	ND	0.004	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.001	mg/L
2,4,5-T -SPLP	ND	0.001	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.05	ug/L
beta-BHC -SPLP	ND	0.05	ug/L
delta-BHC -SPLP	ND	0.05	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.05	ug/L
Heptachlor -SPLP	ND	0.05	ug/L
Aldrin -SPLP	ND	0.05	ug/L
Heptachlor epoxide -SPLP	ND	0.05	ug/L
Endosulfan I -SPLP	ND	0.05	ug/L
Dieldrin -SPLP	ND	0.05	ug/L
4,4'-DDE -SPLP	ND	0.05	ug/L
Endrin -SPLP	ND	0.05	ug/L
Endrin ketone -SPLP	ND	0.05	ug/L
Endrin aldehyde -SPLP	ND	0.05	ug/L
Endosulfan II -SPLP	ND	0.05	ug/L
4,4'-DDD -SPLP	ND	0.05	ug/L
Endosulfan sulfate -SPLP	ND	0.05	ug/L
4,4'-DDT -SPLP	ND	0.05	ug/L
Methoxychlor -SPLP	ND	0.5	ug/L
alpha-Chlordane -SPLP	ND	0.05	ug/L
gamma-Chlordane -SPLP	ND	0.05	ug/L
Toxaphene -SPLP	ND	2	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	1	ug/L
Aroclor 1221 -SPLP	ND	1	ug/L
Aroclor 1232 -SPLP	ND	1	ug/L
Aroclor 1242 -SPLP	ND	1	ug/L
Aroclor 1248 -SPLP	ND	1	ug/L
Aroclor 1254 -SPLP	ND	1	ug/L
Aroclor 1260 -SPLP	ND	1	ug/L
Inorganics			
Aluminum -SPLP	3110	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	11.7	10	ug/L
Barium -SPLP	28.9 B	200	ug/L
Beryllium -SPLP	0.39 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	3060 B	5000	ug/L
Chromium -SPLP	29.2	5	ug/L

Table B-17
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #6 of 7

	HOPPER MATERIAL LEACH		
Sample ID:	**#6**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/19/99		
Analysis Date:	7/22/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	4.8 B	50	ug/L
Copper -SPLP	27.2	25	ug/L
Iron -SPLP	3750	100	ug/L
Lead -SPLP	25.9	3	ug/L
Magnesium -SPLP	1450 B	5000	ug/L
Manganese -SPLP	49.6	15	ug/L
Mercury -SPLP	0.29	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	1720 B	5000	ug/L
Selenium -SPLP	ND	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	32200	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	26.3 B	50	ug/L
Zinc -SPLP	38.8	20	ug/L
General Chemistry			
Total Organic Carbon	1.6	1	mg/L

Table B-18
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #7 of 7

Sample ID:		**HOPPER MATERIAL LEACH #7**	
Receiving Date:		6/25/99	
Sample Date:		6/24/99	
Extraction Date:		7/20/99	
Analysis Date:		8/3/99	
Matrix:		SOLID	
Analyte	Result	LDL	UNITS
Semivolatile Organics			
Acenaphthene -SPLP	ND	0.01	mg/L
Acenaphthylene -SPLP	ND	0.01	mg/L
Anthracene -SPLP	ND	0.01	mg/L
Benzo(a)anthracene -SPLP	ND	0.01	mg/L
Benzo(a)pyrene -SPLP	ND	0.01	mg/L
Benzo(b)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(k)fluoranthene -SPLP	ND	0.01	mg/L
Benzo(ghi)perylene -SPLP	ND	0.01	mg/L
bis(2-Chloroethoxy)methane -SPLP	ND	0.01	mg/L
bis(2-Chloroethyl) ether -SPLP	ND	0.01	mg/L
bis(2-Ethylhexyl) phthalate -SPLP	0.0075 J	0.01	mg/L
4-Bromophenyl phenyl ether -SPLP	ND	0.01	mg/L
Butyl benzyl phthalate -SPLP	ND	0.01	mg/L
Carbazole -SPLP	ND	0.01	mg/L
4-Chloro-3-methylphenol -SPLP	ND	0.01	mg/L
4-Chloroaniline -SPLP	ND	0.01	mg/L
2-Chloronaphthalene -SPLP	ND	0.01	mg/L
2-Chlorophenol -SPLP	ND	0.01	mg/L
4-Chlorophenyl phenyl ether -SPLP	ND	0.01	mg/L
Chrysene -SPLP	ND	0.01	mg/L
Dibenz(a,h)anthracene -SPLP	ND	0.01	mg/L
Dibenzofuran -SPLP	ND	0.01	mg/L
1,2-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,3-Dichlorobenzene -SPLP	ND	0.01	mg/L
1,4-Dichlorobenzene -SPLP	ND	0.01	mg/L
3,3'-Dichlorobenzidine -SPLP	ND	0.05	mg/L
2,4-Dichlorophenol -SPLP	ND	0.01	mg/L
Di-n-butyl phthalate -SPLP	ND	0.01	mg/L
Di-n-octyl phthalate -SPLP	ND	0.01	mg/L
Diethyl phthalate -SPLP	ND	0.01	mg/L
2,4-Dimethylphenol -SPLP	ND	0.01	mg/L
Dimethyl phthalate -SPLP	ND	0.01	mg/L
4,6-Dinitro-2-methylphenol -SPLP	ND	0.05	mg/L
2,4-Dinitrophenol -SPLP	ND	0.05	mg/L
2,4-Dinitrotoluene -SPLP	ND	0.01	mg/L
2,6-Dinitrotoluene -SPLP	ND	0.01	mg/L
Fluoranthene -SPLP	ND	0.01	mg/L
Fluorene -SPLP	ND	0.01	mg/L
Hexachlorobenzene -SPLP	ND	0.01	mg/L
Hexachlorobutadiene -SPLP	ND	0.01	mg/L
Hexachlorocyclopentadiene -SPLP	ND	0.05	mg/L
Hexachloroethane -SPLP	ND	0.01	mg/L
Indeno(1,2,3-cd)pyrene -SPLP	ND	0.01	mg/L
Isophorone -SPLP	ND	0.01	mg/L
2-Methylnaphthalene -SPLP	ND	0.01	mg/L
2-Methylphenol -SPLP	ND	0.01	mg/L
3-Methylphenol & 4-Methylphenol	ND	0.01	mg/L
2-Nitroaniline -SPLP	ND	0.05	mg/L
3-Nitroaniline -SPLP	ND	0.05	mg/L
4-Nitroaniline -SPLP	ND	0.05	mg/L
2-Nitrophenol -SPLP	ND	0.01	mg/L
4-Nitrophenol -SPLP	ND	0.05	mg/L
N-Nitrosodi-n-propylamine -SPLP	ND	0.01	mg/L
N-Nitrosodiphenylamine -SPLP	ND	0.01	mg/L

Table B-18
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #7 of 7

	HOPPER MATERIAL LEACH		
Sample ID:	**#7**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/20/99		
Analysis Date:	8/3/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Semivolatile Organics (continued)			
Naphthalene -SPLP	ND	0.01	mg/L
Nitrobenzene -SPLP	ND	0.01	mg/L
2,2'-oxybis(1-Chloropropane) -SPLP	ND	0.01	mg/L
Pentachlorophenol -SPLP	ND	0.05	mg/L
Phenanthrene -SPLP	ND	0.01	mg/L
Phenol -SPLP	ND	0.01	mg/L
Pyrene -SPLP	ND	0.01	mg/L
1,2,4-Trichlorobenzene -SPLP	ND	0.01	mg/L
2,4,5-Trichlorophenol -SPLP	ND	0.01	mg/L
2,4,6-Trichlorophenol -SPLP	ND	0.01	mg/L
Herbicides			
2,4-D -SPLP	ND	0.008	mg/L
2,4-DB -SPLP	ND	0.008	mg/L
2,4,5-TP (Silvex) -SPLP	ND	0.002	mg/L
2,4,5-T -SPLP	ND	0.002	mg/L
Pesticides			
alpha-BHC -SPLP	ND	0.1	ug/L
beta-BHC -SPLP	ND	0.1	ug/L
delta-BHC -SPLP	ND	0.1	ug/L
gamma-BHC (Lindane) -SPLP	ND	0.1	ug/L
Heptachlor -SPLP	ND	0.1	ug/L
Aldrin -SPLP	ND	0.1	ug/L
Heptachlor epoxide -SPLP	ND	0.1	ug/L
Endosulfan I -SPLP	ND	0.1	ug/L
Dieldrin -SPLP	ND	0.1	ug/L
4,4'-DDE -SPLP	ND	0.1	ug/L
Endrin -SPLP	ND	0.1	ug/L
Endrin ketone -SPLP	ND	0.1	ug/L
Endrin aldehyde -SPLP	ND	0.1	ug/L
Endosulfan II -SPLP	ND	0.1	ug/L
4,4'-DDD -SPLP	ND	0.1	ug/L
Endosulfan sulfate -SPLP	ND	0.1	ug/L
4,4'-DDT -SPLP	ND	0.1	ug/L
Methoxychlor -SPLP	ND	1	ug/L
alpha-Chlordane -SPLP	ND	0.1	ug/L
gamma-Chlordane -SPLP	ND	0.1	ug/L
Toxaphene -SPLP	ND	4	ug/L
PCBs			
Aroclor 1016 -SPLP	ND	2	ug/L
Aroclor 1221 -SPLP	ND	2	ug/L
Aroclor 1232 -SPLP	ND	2	ug/L
Aroclor 1242 -SPLP	ND	2	ug/L
Aroclor 1248 -SPLP	ND	2	ug/L
Aroclor 1254 -SPLP	ND	2	ug/L
Aroclor 1260 -SPLP	ND	2	ug/L
Inorganics			
Aluminum -SPLP	2840	200	ug/L
Antimony -SPLP	ND	10	ug/L
Arsenic -SPLP	8.1 B	10	ug/L
Barium -SPLP	25.7 B	200	ug/L
Beryllium -SPLP	0.29 B	5	ug/L
Cadmium -SPLP	ND	2	ug/L
Calcium -SPLP	3130 B	5000	ug/L
Chromium -SPLP	27.6	5	ug/L

Table B-18
BioGenesis Demonstration Project
"Processed" Decontaminated Sediment
(Mixed with Portland Cement Prior to Analysis)
Multiple Extraction Procedure (MEP) for Leaching #7 of 7

	HOPPER MATERIAL LEACH		
Sample ID:	**#7**		
Receiving Date:	6/25/99		
Sample Date:	6/24/99		
Extraction Date:	7/20/99		
Analysis Date:	8/3/99		
Matrix:	SOLID		
Analyte	Result	LDL	UNITS
Inorganics (continued)			
Cobalt -SPLP	2.8 B	50	ug/L
Copper -SPLP	29.3	25	ug/L
Iron -SPLP	3430	100	ug/L
Lead -SPLP	23.1	3	ug/L
Magnesium -SPLP	1390 B	5000	ug/L
Manganese -SPLP	46.6	15	ug/L
Mercury -SPLP	0.46	0.2	ug/L
Nickel -SPLP	ND	40	ug/L
Potassium -SPLP	1340 B	5000	ug/L
Selenium -SPLP	1.7 B	5	ug/L
Silver -SPLP	ND	5	ug/L
Sodium -SPLP	27400	5000	ug/L
Thallium -SPLP	ND	10	ug/L
Total Cyanide	ND	10	ug/L
Vanadium -SPLP	20.0 B	50	ug/L
Zinc -SPLP	39.6	20	ug/L
General Chemistry			
Total Organic Carbon	1.7	1	mg/L
Furans			
Total TCDF -SPLP	ND	4.9	pg/L
2,3,7,8-TCDF -SPLP	ND	4.6	pg/L
Total PeCDF -SPLP	ND	3.6	pg/L
1,2,3,7,8-PeCDF -SPLP	ND	1.2	pg/L
2,3,4,7,8-PeCDF -SPLP	ND	1.2	pg/L
Total HxCDF -SPLP	ND	3.1	pg/L
1,2,3,4,7,8-HxCDF -SPLP	ND	2.8	pg/L
1,2,3,6,7,8-HxCDF -SPLP	ND	2.4	pg/L
2,3,4,6,7,8-HxCDF -SPLP	ND	2.8	pg/L
1,2,3,4,7,8,9-HpCDF -SPLP	ND	1	pg/L
1,2,3,7,8,9-HxCDF -SPLP	ND	3.1	pg/L
Total HpCDF -SPLP	ND	9.8	pg/L
1,2,3,4,6,7,8-HpCDF -SPLP	ND	9.8	pg/L
OCDF -SPLP	ND	12	pg/L
Dioxins			
Total TCDD -SPLP	ND	3.7	pg/L
2,3,7,8-TCDD -SPLP	ND	3.7	pg/L
Total PeCDD -SPLP	ND	1.9	pg/L
1,2,3,7,8-PeCDD -SPLP	ND	1.9	pg/L
Total HxCDD -SPLP	ND	2.8	pg/L
1,2,3,4,7,8-HxCDD -SPLP	ND	2	pg/L
1,2,3,6,7,8-HxCDD -SPLP	ND	1.8	pg/L
1,2,3,7,8,9-HxCDD -SPLP	ND	1.8	pg/L
Total HpCDD -SPLP	ND	10	pg/L
1,2,3,4,6,7,8-HpCDD -SPLP	ND	8.8	pg/L
OCDD -SPLP	63 J		pg/L

Table B-19

Dredged Material Placement Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
SCOW MATERIAL	SW846 8151A, Herbicides	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SW846 8290, Dioxins/Furans	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SW846 6010B, Metals	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SW846 7471A, Mercury	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SW846 8081A, Herbicides/Pesticides	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SW846 8082, PCBs	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SW846 8270C, PAHs	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SW846 9012A, Total Cyanide	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SMCA WALKLEY-BLACK, TOC	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	MCAWW 160.3 MOD, % Moisture	BIO-1	C9F250165	C9F250165 001
SCOW MATERIAL	SW846 6010B, Metals	BIO-1	C9F250165	C9F250165 001
HOPPER MATERIAL	SW846 8151A, Herbicides	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SW846 8290, Dioxins/Furans	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SW846 6010B, Metals	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SW846 7471A, Mercury	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SW846 8081A, Herbicides/Pesticides	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SW846 8082, PCBs	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SW846 8270C, PAHs	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SW846 9012A, Total Cyanide	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SMCA WALKLEY-BLACK, TOC	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	MCAWW 160.3 MOD, % Moisture	BIO-1	C9F250165	C9F250165 002
HOPPER MATERIAL	SW846 6010B, Metals	BIO-1	C9F250165	C9F250165 002
SCOW MATERIAL LEACH #1	SW846 8151A, Herbicides	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 8290, Dioxins/Furans	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 6010B, Metals	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 7470A, Mercury	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 8081A, Herbicides/Pesticides	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 8082, PCBs	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 8270C, PAHs	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 9012A, Total Cyanide	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	MCAWW 415.1, TOC	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 6010B, Metals	BIO-2	C9F250157	C9F250157 001
SCOW MATERIAL LEACH #1	SW846 8290, Dioxins/Furans	NA	C9F50157	C9F50157 001
HOOPER MATERIAL LEACH #1	SW846 8151A, Herbicides	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	SW846 8290, Dioxins/Furans	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	SW846 6010B, Metals	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	SW846 7470A, Mercury	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	SW846 8081A, Herbicides/Pesticides	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	SW846 8082, PCBs	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	SW846 8270C, PAHs	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	SW846 9012A, Total Cyanide	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	MCAWW 415.1, TOC	BIO-2	C9F250157	C9F250157 002
HOOPER MATERIAL LEACH #1	SW846 6010B, Metals	BIO-2	C9F250157	C9F250157 002
HOPPER MATERIAL LEACH #1	SW846 8290, Dioxins/Furans	NA	C9F50157	C9F50157 002
SCOW MATERIAL LEACH #2	SW846 8151A, Herbicides	BIO-2	C9G060103	C9G060103 001
SCOW MATERIAL LEACH #2	SW846 6010B, Metals	BIO-2	C9G060103	C9G060103 001
SCOW MATERIAL LEACH #2	SW846 7470A, Mercury	BIO-2	C9G060103	C9G060103 001
SCOW MATERIAL LEACH #2	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G060103	C9G060103 001
SCOW MATERIAL LEACH #2	SW846 8082, PCBs	BIO-2	C9G060103	C9G060103 001
SCOW MATERIAL LEACH #2	SW846 8270C, PAHs	BIO-2	C9G060103	C9G060103 001
SCOW MATERIAL LEACH #2	SW846 9012A, Total Cyanide	BIO-2	C9G060103	C9G060103 001
SCOW MATERIAL LEACH #2	MCAWW 415.1, TOC	BIO-2	C9G060103	C9G060103 001
SCOW MATERIAL LEACH #2	SW846 6010B, Metals	BIO-2	C9G060103	C9G060103 001
HOPPER MATERIAL LEACH #2	SW846 8151A, Herbicides	BIO-2	C9G060103	C9G060103 002
HOPPER MATERIAL LEACH #2	SW846 6010B, Metals	BIO-2	C9G060103	C9G060103 002
HOPPER MATERIAL LEACH #2	SW846 7470A, Mercury	BIO-2	C9G060103	C9G060103 002
HOPPER MATERIAL LEACH #2	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G060103	C9G060103 002
HOPPER MATERIAL LEACH #2	SW846 8082, PCBs	BIO-2	C9G060103	C9G060103 002
HOPPER MATERIAL LEACH #2	SW846 8270C, PAHs	BIO-2	C9G060103	C9G060103 002
HOPPER MATERIAL LEACH #2	SW846 9012A, Total Cyanide	BIO-2	C9G060103	C9G060103 002
HOPPER MATERIAL LEACH #2	MCAWW 415.1, TOC	BIO-2	C9G060103	C9G060103 002
HOPPER MATERIAL LEACH #2	SW846 6010B, Metals	BIO-2	C9G060103	C9G060103 002
SCOW MATERIAL LEACH #3	SW846 8151A, Herbicides	BIO-2	C9G070104	C9G070104 001
SCOW MATERIAL LEACH #3	SW846 6010B, Metals	BIO-2	C9G070104	C9G070104 001

Table B-19

Dredged Material Placement Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
SCOW MATERIAL LEACH #3	SW846 7470A, Mercury	BIO-2	C9G070104	C9G070104 001
SCOW MATERIAL LEACH #3	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G070104	C9G070104 001
SCOW MATERIAL LEACH #3	SW846 8082, PCBs	BIO-2	C9G070104	C9G070104 001
SCOW MATERIAL LEACH #3	SW846 8270C, PAHs	BIO-2	C9G070104	C9G070104 001
SCOW MATERIAL LEACH #3	SW846 9012A, Total Cyanide	BIO-2	C9G070104	C9G070104 001
SCOW MATERIAL LEACH #3	MCAWW 415.1, TOC	BIO-2	C9G070104	C9G070104 001
SCOW MATERIAL LEACH #3	SW846 6010B, Metals	BIO-2	C9G070104	C9G070104 001
HOPPER MATERIAL LEACH #3	SW846 8151A, Herbicides	BIO-2	C9G070104	C9G070104 002
HOPPER MATERIAL LEACH #3	SW846 6010B, Metals	BIO-2	C9G070104	C9G070104 002
HOPPER MATERIAL LEACH #3	SW846 7470A, Mercury	BIO-2	C9G070104	C9G070104 002
HOPPER MATERIAL LEACH #3	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G070104	C9G070104 002
HOPPER MATERIAL LEACH #3	SW846 8082, PCBs	BIO-2	C9G070104	C9G070104 002
HOPPER MATERIAL LEACH #3	SW846 8270C, PAHs	BIO-2	C9G070104	C9G070104 002
HOPPER MATERIAL LEACH #3	SW846 9012A, Total Cyanide	BIO-2	C9G070104	C9G070104 002
HOPPER MATERIAL LEACH #3	MCAWW 415.1, TOC	BIO-2	C9G070104	C9G070104 002
HOPPER MATERIAL LEACH #3	SW846 6010B, Metals	BIO-2	C9G070104	C9G070104 002
SCOW MATERIAL LEACH #4	SW846 8151A, Herbicides	BIO-2	C9G080177	C9G080177 001
SCOW MATERIAL LEACH #4	SW846 6010B, Metals	BIO-2	C9G080177	C9G080177 001
SCOW MATERIAL LEACH #4	SW846 7470A, Mercury	BIO-2	C9G080177	C9G080177 001
SCOW MATERIAL LEACH #4	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G080177	C9G080177 001
SCOW MATERIAL LEACH #4	SW846 8082, PCBs	BIO-2	C9G080177	C9G080177 001
SCOW MATERIAL LEACH #4	SW846 8270C, PAHs	BIO-2	C9G080177	C9G080177 001
SCOW MATERIAL LEACH #4	SW846 9012A, Total Cyanide	BIO-2	C9G080177	C9G080177 001
SCOW MATERIAL LEACH #4	MCAWW 415.1, TOC	BIO-2	C9G080177	C9G080177 001
SCOW MATERIAL LEACH #4	SW846 6010B, Metals	BIO-2	C9G080177	C9G080177 001
HOPPER MATERIAL LEACH #4	SW846 8151A, Herbicides	BIO-2	C9G080177	C9G080177 002
HOPPER MATERIAL LEACH #4	SW846 6010B, Metals	BIO-2	C9G080177	C9G080177 002
HOPPER MATERIAL LEACH #4	SW846 7470A, Mercury	BIO-2	C9G080177	C9G080177 002
HOPPER MATERIAL LEACH #4	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G080177	C9G080177 002
HOPPER MATERIAL LEACH #4	SW846 8082, PCBs	BIO-2	C9G080177	C9G080177 002
HOPPER MATERIAL LEACH #4	SW846 8270C, PAHs	BIO-2	C9G080177	C9G080177 002
HOPPER MATERIAL LEACH #4	SW846 9012A, Total Cyanide	BIO-2	C9G080177	C9G080177 002
HOPPER MATERIAL LEACH #4	MCAWW 415.1, TOC	BIO-2	C9G080177	C9G080177 002
HOPPER MATERIAL LEACH #4	SW846 6010B, Metals	BIO-2	C9G080177	C9G080177 002
SCOW MATERIAL LEACH #5	SW846 8151A, Herbicides	BIO-2	C9G090155	C9G090155 001
SCOW MATERIAL LEACH #5	SW846 6010B, Metals	BIO-2	C9G090155	C9G090155 001
SCOW MATERIAL LEACH #5	SW846 7470A, Mercury	BIO-2	C9G090155	C9G090155 001
SCOW MATERIAL LEACH #5	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G090155	C9G090155 001
SCOW MATERIAL LEACH #5	SW846 8082, PCBs	BIO-2	C9G090155	C9G090155 001
SCOW MATERIAL LEACH #5	SW846 8270C, PAHs	BIO-2	C9G090155	C9G090155 001
SCOW MATERIAL LEACH #5	SW846 9012A, Total Cyanide	BIO-2	C9G090155	C9G090155 001
SCOW MATERIAL LEACH #5	MCAWW 415.1, TOC	BIO-2	C9G090155	C9G090155 001
SCOW MATERIAL LEACH #5	SW846 6010B, Metals	BIO-2	C9G090155	C9G090155 001
HOPPER MATERIAL LEACH #5	SW846 8151A, Herbicides	BIO-2	C9G090155	C9G090155 002
HOPPER MATERIAL LEACH #5	SW846 6010B, Metals	BIO-2	C9G090155	C9G090155 002
HOPPER MATERIAL LEACH #5	SW846 7470A, Mercury	BIO-2	C9G090155	C9G090155 002
HOPPER MATERIAL LEACH #5	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G090155	C9G090155 002
HOPPER MATERIAL LEACH #5	SW846 8082, PCBs	BIO-2	C9G090155	C9G090155 002
HOPPER MATERIAL LEACH #5	SW846 8270C, PAHs	BIO-2	C9G090155	C9G090155 002
HOPPER MATERIAL LEACH #5	SW846 9012A, Total Cyanide	BIO-2	C9G090155	C9G090155 002
HOPPER MATERIAL LEACH #5	MCAWW 415.1, TOC	BIO-2	C9G090155	C9G090155 002
HOPPER MATERIAL LEACH #5	SW846 6010B, Metals	BIO-2	C9G090155	C9G090155 002
SCOW MATERIAL LEACH #6	SW846 8151A, Herbicides	BIO-2	C9G120142	C9G120142 001
SCOW MATERIAL LEACH #6	SW846 6010B, Metals	BIO-2	C9G120142	C9G120142 001
SCOW MATERIAL LEACH #6	SW846 7470A, Mercury	BIO-2	C9G120142	C9G120142 001
SCOW MATERIAL LEACH #6	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G120142	C9G120142 001
SCOW MATERIAL LEACH #6	SW846 8082, PCBs	BIO-2	C9G120142	C9G120142 001
SCOW MATERIAL LEACH #6	SW846 8270C, PAHs	BIO-2	C9G120142	C9G120142 001
SCOW MATERIAL LEACH #6	SW846 9012A, Total Cyanide	BIO-2	C9G120142	C9G120142 001
SCOW MATERIAL LEACH #6	MCAWW 415.1, TOC	BIO-2	C9G120142	C9G120142 001
SCOW MATERIAL LEACH #6	SW846 6010B, Metals	BIO-2	C9G120142	C9G120142 001
HOPPER MATERIAL LEACH #6	SW846 8151A, Herbicides	BIO-2	C9G120142	C9G120142 002
HOPPER MATERIAL LEACH #6	SW846 6010B, Metals	BIO-2	C9G120142	C9G120142 002
HOPPER MATERIAL LEACH #6	SW846 7470A, Mercury	BIO-2	C9G120142	C9G120142 002

Table B-19

Dredged Material Placement Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
HOPPER MATERIAL LEACH #6	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G120142	C9G120142 002
HOPPER MATERIAL LEACH #6	SW846 8082, PCBs	BIO-2	C9G120142	C9G120142 002
HOPPER MATERIAL LEACH #6	SW846 8270C, PAHs	BIO-2	C9G120142	C9G120142 002
HOPPER MATERIAL LEACH #6	SW846 9012A, Total Cyanide	BIO-2	C9G120142	C9G120142 002
HOPPER MATERIAL LEACH #6	MCAWW 415.1, TOC	BIO-2	C9G120142	C9G120142 002
HOPPER MATERIAL LEACH #6	SW846 6010B, Metals	BIO-2	C9G120142	C9G120142 002
SCOW MATERIAL LEACH #7	SW846 8151A, Herbicides	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	SW846 8290, Dioxins/Furans	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	SW846 6010B, Metals	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	SW846 7470A, Mercury	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	SW846 8082, PCBs	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	SW846 8270C, PAHs	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	SW846 9012A, Total Cyanide	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	MCAWW 415.1, TOC	BIO-2	C9G130203	C9G130203 001
SCOW MATERIAL LEACH #7	SW846 6010B, Metals	BIO-2	C9G130203	C9G130203 001
HOPPER MATERIAL LEACH #7	SW846 8151A, Herbicides	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	SW846 8290, Dioxins/Furans	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	SW846 6010B, Metals	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	SW846 7470A, Mercury	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	SW846 8081A, Herbicides/Pesticides	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	SW846 8082, PCBs	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	SW846 8270C, PAHs	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	SW846 9012A, Total Cyanide	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	MCAWW 415.1, TOC	BIO-2	C9G130203	C9G130203 002
HOPPER MATERIAL LEACH #7	SW846 6010B, Metals	BIO-2	C9G130203	C9G130203 002

APPENDIX C

TESTING PHASE – SUMMARY DATA

APPENDIX C
TESTING PHASE SUMMARY DATA
LIST OF TABLES

Table

C-1 Testing Phase Operating Conditions

C-2 Testing Phase Analytical Results

C-3 Sample Identification Reference

Apendix C - Testing Phase Summary Data

Notes/Abbreviations:

Table C-1 - Testing Phase Operating Condition
Data indicate average values over the applicable run.
** Not operating reliably.
*** Gauge not operable.
NA = Not applicable.
NR = Not recorded.
NR-NO = Value Not Recorded; System at Normal Operating Conditions.
e = Estimated value.
c = Calculated value.

Table C-2 - Testing Phase Analytical Results Summary
(1) SAQ-19-01-01 data are in following units: TRPH = mg/L, PAHs = ug/L, Metals = mg/L
B = Estimated result. Result is less thatn the reporting limit (metals).
J = Estimated result. Result is less than reporting limit (PAHs).
MBB = This analyte (metal) is present at a reportable level in the associated method blank, but is less than 5% of sample amount.
U = Not detected. Associated number indicates the reporting limit.

Table C-1

Testing Phase Operating Conditions

Batch Number	1	2			3	4	5			6	7	8		9
Test Run Number	1	1	2	3	1	1	1	2	3	1	1	1	2	1
Run/Sample Date	2/10/99	2/12/99			2/15/99	2/15/99	2/15/99			2/16/99	2/16/99	2/17/99		2/17/99
Batch Description/Control Variable	100% Standard Operating Conditions	Sediment Flow Rate to Pre-Processor			HP Water Flow Rate to Pre-Processor		Aeration Time			Chelating Agent Quantity	HP Water Flow Rate to Collision Chamber	Sediment Flow Rate to Collision Chamber		
Unit Process/Control Variable														
Pre-Processor Mix Tank														
Total Sediment Volume (gal/batch)	2,000	2,230			2,200	2,250	2,275			2,250	2,275	2,250		2,250
Surfactant S11 (kg/batch)	2	2			2	2	2			2	2	2		2
Surfactant S12 (kg/batch)	2	2			2	2	2			2	2	2		2
Surfactant S13 (kg/batch)	2	2			2	2	2			2	2	2		2
Surfactant S14 (kg/batch)	2	2			2	2	2			2	2	2		2
Surfactant S15 (kg/batch)	0	0			0	0	0			0	0	0		0
Defoamer (pints/batch)	2	2			2	2	2			2	2	2		2
Chelating Agent (kg/batch)	3	3			3	3	3			1.5	3	3		3
Sodium Percarbonate (kg/batch)	4	4			4	4	4			4	4	4		4
Pre-Processor Unit														
Sediment Inlet Flow Rate (gpm)	140 **c**	20 **c**	108 **c**	119 **c**	147 **c**	138 **c**	136 **c**			133 **c**	134 **c**	125 **c**		125 **c**
Avg. Sediment Inlet Pressure (psig)	136	145			143	126	145			136	149	138		140
Avg. High Pressure Water Inlet Pressure (psig)	9,000	9,733			8,750	9,833	10,000			10,000	10,000	10,000		10,000
High Pressure Water Flow Rate (gpm)	60 **e**	60 **e**			30 **e**	45 **e**	60 **e**			60 **e**	60 **e**	60 **e**		60 **e**
Avg. Sediment Outlet Pressure (psig)	168	179			154	159	170			171	169	175		176
Aerator														
Total Aeration Time (min)	15	0			20	17	0	15	60	15	17	22		15
Total Settling Time (min)	5	0			5	7	0			11	8	18		5
Air Flow Rate (cfm)	NR	0			NR	NR	NR			NR	NR	NR		NR
Collision Chamber														
Avg. Sediment Inlet Flow Rate (gpm)	256	282			228	263	270			272	259	165		271
Avg. Sediment Inlet Pressure (psig)	132	140			116	130	122			122	117	138		81
Avg. High Pressure Water Inlet Pressure (psig)	9,900	9,000			10,000	10,000	9,800			10,000	9,900	10,000		10,000
High Pressure Water Flow Rate (gpm)	60 **e**	60 **e**			60 **e**	60 **e**	60 **e**			60 **e**	45 **e**	60 **e**		60 **e**
Cavitation/Oxidation Unit														
Avg. Sediment Inlet Pressure (psig)	81	NR-NO			82	85	NR-NO			88	85	85		87
Avg. Cav/Ox Unit Pressure (psig)	-20	NR-NO			-20	NR	NR-NO			-3	NR	-3		-3
Cav/Ox Unit Flow Rate (gpm)	NR	NR-NO			NR	NR	NR-NO			NR	NR	NR		NR
Hydrogen Peroxide Dosage (gal)	1.27	NR-NO			1.25	1.25	NR-NO			1.25	NR	NR		NR
Sodium Percarbonate (kg/batch)	0	NR-NO			0	0	NR-NO			0	NR	NR		NR
Recycle Flow Rate (gpm)	NR	NR-NO			NR	NR	NR-NO			NR	NR	NR		NR
Cav/Ox Duration (min)	61	NR-NO			60	60	NR-NO			60	30	60		NR
Hydrocyclone														
Sediment Inlet Pressure (psig)	40	NR-NO			40	40	NR-NO			40	NR-NO	NR-NO		NR-NO
Sediment Inlet Flow Rate (gpm)	60 **e**	NR-NO			NR-NO	NR-NO	NR-NO			NR	NR-NO	NR-NO		NR-NO
Centrifuge														
Sediment Flow Rate to Centrifuge (gpm)	NR	NR-NO			NR-NO	NR-NO	NR-NO			NR	NR-NO	NR-NO		NR-NO
Pond Depth Setting	3.2	NR-NO			NR-NO	NR-NO	NR-NO			NR	NR-NO	NR-NO		NR-NO
Avg. Centrifuge Bowl Speed (rpm)	2,949	NR-NO			NR-NO	NR-NO	NR-NO			2,941	NR-NO	NR-NO		NR-NO
Avg. Conveyor Speed (rpm)	1,060	NR-NO			NR-NO	NR-NO	NR-NO			1,380	NR-NO	NR-NO		NR-NO
Centrifuge Centrate Flow Rate (gpm)	50 **c**	NR-NO			NR-NO	NR-NO	NR-NO			60	NR-NO	NR-NO		NR-NO

Table C-1

Testing Phase Operating Conditions

Batch Number	10										11	12	13	14
Test Run Number	1	2	3	4	5	6	7	8	9	10	1	1	1	1
Run/Sample Date	2/18/99										2/18/99	2/19/99	2/23/99	2/24/99
Batch Description/Control Variable	Sediment Flow Rate to Hydrocyclone			Centrifuge Bowl Speed		Centrifuge Differential Pressure			Sediment Flow Rate to Centrifuge		Sodium Percarbonate Addtion	Surfactant/ Defoamer Addition	Hydrogen Peroxide Addition at Cav/Ox Unit	
Unit Process/Control Variable														
Pre-Processor Mix Tank														
Total Sediment Volume (gal/batch)	2,350										2,300	2,300	2,300	2,350
Surfactant S11 (kg/batch)	2										2	1	2	2
Surfactant S12 (kg/batch)	2										2	1	2	2
Surfactant S13 (kg/batch)	2										2	1	2	2
Surfactant S14 (kg/batch)	2										2	1	2	2
Surfactant S15 (kg/batch)	0										0	0	0	0
Defoamer (pints/batch)	2										2	1	2	2
Chelating Agent (kg/batch)	3										3	3	3	3
Sodium Percarbonate (kg/batch)	4										2	4	4	4
Pre-Processor Unit														
Sediment Inlet Flow Rate (gpm)	138 **c**										144 **c**	131 **c**	128 **c**	138 **c**
Avg. Sediment Inlet Pressure (psig)	140										135	136	142	140
Avg. High Pressure Water Inlet Pressure (psig)	10,000										10,000	10,000	10,000	10,000
High Pressure Water Flow Rate (gpm)	60 **e**										60 **e**	60 **e**	60 **e**	60 **e**
Avg. Sediment Outlet Pressure (psig)	175										170	171	171	170
Aerator														
Total Aeration Time (min)	15										15	15	15	NR
Total Settling Time (min)	5										10	7	7	NR
Air Flow Rate (cfm)	NR										NR	NR	NR	NR
Collision Chamber														
Avg. Sediment Inlet Flow Rate (gpm)	NR										NR	NR	NR	NR
Avg. Sediment Inlet Pressure (psig)	125										124	125	124	NR-NO
Avg. High Pressure Water Inlet Pressure (psig)	10,000										9,833	9,950	9,900	NR-NO
High Pressure Water Flow Rate (gpm)	60 **e**										60 **e**	60 **e**	60 **e**	60 **e**
Cavitation/Oxidation Unit														
Avg. Sediment Inlet Pressure (psig)	83										85	85	83	85
Avg. Cav/Ox Unit Pressure (psig)	NR										NR	NR	NR	NR
Cav/Ox Unit Flow Rate (gpm)	NR										NR	NR	NR	NR
Hydrogen Peroxide Dosage (gal)	1										NR	1.25	1.03	2.43
Sodium Percarbonate (kg/batch)	0										0	0	0	5
Recycle Flow Rate (gpm)	NR										NR	NR	NR	NR
Cav/Ox Duration (min)	61										NR	73	81	NR-NO
Hydrocyclone														
Sediment Inlet Pressure (psig)	40	32	50	40	40	40	40	40	40	40	NR-NO	NR-NO	NR-NO	NR-NO
Sediment Inlet Flow Rate (gpm)	60	49	61.2	60	60	60	60	60	60	60	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge														
Sediment Flow Rate to Centrifuge (gpm)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR-NO	NR-NO	NR-NO	NR-NO
Pond Depth Setting	3.2	3.2	3.2	2.6	4.0	3.2	3.2	3.2	3.2	3.2	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Centrifuge Bowl Speed (rpm)	3040	3040	3040	3010	3,010	3040	3095	3018	3090	3000	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Conveyor Speed (rpm)	1380	1380	1380	1350	1350	1380	400	1955	1400	300	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge Centrate Flow Rate (gpm)	50	50	50	50	50	50	50	50	37	67	NR-NO	NR-NO	NR-NO	NR-NO

Table C-1

Testing Phase Operating Conditions

Batch Number	15			16	17	18	19	20	21	22	23	24	25	26	27	28
Test Run Number	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1
Run/Sample Date	2/25/99			2/26/99	3/1/99	3/1/99	3/2/99	3/2/99	3/2/99	3/3/99	3/3/99	3/3/99	3/3/99	3/3/99	3/4/99	3/4/99
Batch Description/Control Variable	Recycle Duration at Cav/Ox Unit			Switch Pre-Processor and Venturi Flow Inhibitor	Surfactant Quantity	Chelating Agent Quantity	100% Standard Operating Conditions	Type of Surfactant	Retreat Sludge from Batch 19	100% Run	100% Run	100% Run	100% Run	100% Run	Hydrogen Peroxide Addition Rate	Sodium Percarbonate Addition
Unit Process/Control Variable																
Pre-Processor Mix Tank																
Total Sediment Volume (gal/batch)	2,350			2,300	2,400	2,300	2,300	2,325	1,500	2,350	2,600	2,790	2,650	2,700	2,275	2,325
Surfactant S11 (kg/batch)	2			2	0	2	2	0	0	1	1	1.5	0	0	2	2
Surfactant S12 (kg/batch)	2			2	0	2	2	4	0	1	1	1.5	0	4	2	2
Surfactant S13 (kg/batch)	2			2	0	2	2	0	0	1	1	0	0	0	2	2
Surfactant S14 (kg/batch)	2			2	0	2	2	0	0	2	0	0	0	0	2	2
Surfactant S15 (kg/batch)	0			0	0	0	0	4	0	0	0	0	0	0	0	0
Defoamer (pints/batch)	2			2	2	2	2	2	0	2	1	1	0	0	2	2
Chelating Agent (kg/batch)	3			3	3	0	3	3	0	3	3	3	0	0	3	3
Sodium Percarbonate (kg/batch)	4			4	4	4	4	4	0	4	4	4	0	0	4	4
Pre-Processor Unit																
Sediment Inlet Flow Rate (gpm)	138 **c**			164 **c**	141 **c**	135 **c**	135 **c**	145 **c**	136 **c**	147 **c**	137 **c**	147 **c**	133 **c**	142 **c**	134 **c**	137 **c**
Avg. Sediment Inlet Pressure (psig)	140			137	134	135	135	136	136	140	140	140	140	140	140	138
Avg. High Pressure Water Inlet Pressure (psig)	10,000			9,950	10,000	10,000	9,800	9,800	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
High Pressure Water Flow Rate (gpm)	60 **e**			60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**
Avg. Sediment Outlet Pressure (psig)	170			NR	167	166	166	166	166	170	170	170	170	170	170	168
Aerator																
Total Aeration Time (min)	16			17	15	16	16	16	NR-NO	NR	NR	NR	NR	NR	15	16
Total Settling Time (min)	NR			15	9	12	7	7	NR-NO	NR	NR	NR	NR	NR	5	8
Air Flow Rate (cfm)	NR			NR	NR	NR	NR	NR	NR-NO	NR	NR	NR	NR	NR	NR	NR
Collision Chamber																
Avg. Sediment Inlet Flow Rate (gpm)	NR			NR	NR	NR	NR	NR	NR-NO	NR	NR	NR	NR	NR	NR	NR
Avg. Sediment Inlet Pressure (psig)	NR			123	67	128	96	104	NR-NO	115	120	120	130	120	115	118
Avg. High Pressure Water Inlet Pressure (psig)	NR			9,850	9,733	9,800	9,733	9,700	NR-NO	10,000	10,000	10,000	10,000	10,000	10,000	9,866
High Pressure Water Flow Rate (gpm)	60 **e**			60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	NR-NO	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**	60 **e**
Cavitation/Oxidation Unit																
Avg. Sediment Inlet Pressure (psig)	85			85	85	82	87	84	NR-NO	NR	85	NR-NO	85	NR-NO	85	81
Avg. Cav/Ox Unit Pressure (psig)	-29			NR	NR	NR	NR	NR	NR-NO	NR	NR	NR-NO	NR	NR-NO	NR	NR
Cav/Ox Unit Flow Rate (gpm)	NR-NO			520	460	474	485	471	NR-NO	485	493	NR-NO	482	NR-NO	478	486
Hydrogen Peroxide Dosage (gal)	NR-NO			NR-NO	2.43	NR	2.4	2.4	NR-NO	NR	NR	NR-NO	NR	NR-NO	1.2	2.4
Sodium Percarbonate (kg/batch)	NR-NO			0	0	0	0	0	NR-NO	NR	NR	NR-NO	NR	NR-NO	0	5
Recycle Flow Rate (gpm)	NR-NO			NR	165	157	145	156	NR-NO	146	158	NR-NO	156	NR-NO	135	154
Cav/Ox Duration (min)	30	60	120	NR	60	60	62	NR	NR-NO	NR	NR	NR-NO	NR	NR-NO	62	60
Hydrocyclone																
Sediment Inlet Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Sediment Inlet Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge																
Sediment Flow Rate to Centrifuge (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Pond Depth Setting	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Centrifuge Bowl Speed (rpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Conveyor Speed (rpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge Centrate Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO

Table C-1

Testing Phase Operating Conditions

Batch Number	29			30	31	32	33	34	35	36	37	38	39	40	41	42	43
Test Run Number	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Run/Sample Date	3/4/99			3/4/99	3/5/99	3/5/99	3/5/99	3/8/99	3/8/99	3/8/99	3/8/99	3/9/99	3/10/99	3/10/99	3/10/99	3/15/99	3/18/99
Batch Description/Control Variable	Recycle Duration at Cav/Ox Unit			100% Run	100% Run	Process Controls	Retreat Sluge from Batch 31	100% Run	100% Run	100% Run	100% Run	Two Pre-Processors in Series	100% Run	100% Run	100% Run	100% Run	100% Run
Unit Process/Control Variable																	
Pre-Processor Mix Tank																	
Total Sediment Volume (gal/batch)	2,325			2,424 e	2,300	2,300	1,500	2,424 e	2,424 e	2,424 e	2,424 e	2,400	2,424 e	2,424 e	2,424 e	2,424 e	2,424 e
Surfactant S11 (kg/batch)	2			NR-NO	2	0	0	NR-NO	NR-NO	NR-NO	NR-NO	2	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Surfactant S12 (kg/batch)	2			NR-NO	2	0	0	NR-NO	NR-NO	NR-NO	NR-NO	2	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Surfactant S13 (kg/batch)	2			NR-NO	2	0	0	NR-NO	NR-NO	NR-NO	NR-NO	2	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Surfactant S14 (kg/batch)	2			NR-NO	2	0	0	NR-NO	NR-NO	NR-NO	NR-NO	2	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Surfactant S15 (kg/batch)	0			NR-NO	0	0	0	NR-NO	NR-NO	NR-NO	NR-NO	0	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Defoamer (pints/batch)	2			NR-NO	2	0	0	NR-NO	NR-NO	NR-NO	NR-NO	2	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Chelating Agent (kg/batch)	3			NR-NO	3	0	0	NR-NO	NR-NO	NR-NO	NR-NO	3	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Sodium Percarbonate (kg/batch)	4			NR-NO	4	0	0	NR-NO	NR-NO	NR-NO	NR-NO	4	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Pre-Processor Unit																	
Sediment Inlet Flow Rate (gpm)	137 c			NR-NO	100 **c**	135 **c**	214 **c**	NR-NO	NR-NO	NR-NO	NR-NO	141 **c**	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Sediment Inlet Pressure (psig)	136			NR-NO	136	NR	142	NR-NO	NR-NO	NR-NO	NR-NO	NR	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. High Pressure Water Inlet Pressure (psig)	9,900			NR-NO	9,700	NR	9,900	NR-NO	NR-NO	NR-NO	NR-NO	9,900	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
High Pressure Water Flow Rate (gpm)	60 **e**			NR-NO	60 **e**	60 **e**	60 **e**	NR-NO	NR-NO	NR-NO	NR-NO	60 **e**	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Sediment Outlet Pressure (psig)	167			NR-NO	169	NR	176	NR-NO	NR-NO	NR-NO	NR-NO	166	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Aerator																	
Total Aeration Time (min)	17			NR-NO	15	15	14	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Total Settling Time (min)	9			NR-NO	NR	5	4	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Air Flow Rate (cfm)	NR			NR-NO	NR	NR	NR	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Collision Chamber																	
Avg. Sediment Inlet Flow Rate (gpm)	NR			NR-NO	NR	NR	NR	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Sediment Inlet Pressure (psig)	115			NR-NO	123	113	138	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. High Pressure Water Inlet Pressure (psig)	10,000			NR-NO	9,700	9,900	9,900	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
High Pressure Water Flow Rate (gpm)	60 **e**			NR-NO	60 **e**	60 **e**	60 **e**	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Cavitation/Oxidation Unit																	
Avg. Sediment Inlet Pressure (psig)	81			NR-NO	NR	84	83	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Cav/Ox Unit Pressure (psig)	NR			NR-NO	NR	NR	NR	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Cav/Ox Unit Flow Rate (gpm)	464			NR-NO	NR	481	531	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Hydrogen Peroxide Dosage (gal)	1.2	2.4	4.8	NR-NO	2.4	0	2.4	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Sodium Percarbonate (kg/batch)	0			NR-NO	0	0	0	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Recycle Flow Rate (gpm)	151			NR-NO	NR	151	121	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Cav/Ox Duration (min)	30	60	120	NR-NO	NR	61	60	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Hydrocyclone																	
Sediment Inlet Pressure (psig)	NR-NO			NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Sediment Inlet Flow Rate (gpm)	NR-NO			NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge																	
Sediment Flow Rate to Centrifuge (gpm)	NR-NO			NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Pond Depth Setting	NR-NO			NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Centrifuge Bowl Speed (rpm)	NR-NO			NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Conveyor Speed (rpm)	NR-NO			NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge Centrate Flow Rate (gpm)	NR-NO			NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO

Table C-1

Testing Phase Operating Conditions

Batch Number	44	45	46	47	48	49	50
Test Run Number	1	1	1	1	1	1	1
Run/Sample Date	3/18/99	3/18/99	3/18/99	3/19/99	3/19/99	3/19/99	3/19/99
Batch Description/Control Variable	100% Run	100% Run	100% Run	100% Run	100% Run	100% Run	100% Run
Unit Process/Control Variable							
Pre-Processor Mix Tank							
Total Sediment Volume (gal/batch)	2,424 e	2,424 e	2,424 e	2,424 e	2,424 e	2,424 e	2,424 e
Surfactant S11 (kg/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Surfactant S12 (kg/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Surfactant S13 (kg/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Surfactant S14 (kg/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Surfactant S15 (kg/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Defoamer (pints/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Chelating Agent (kg/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Sodium Percarbonate (kg/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Pre-Processor Unit							
Sediment Inlet Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Sediment Inlet Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. High Pressure Water Inlet Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
High Pressure Water Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Sediment Outlet Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Aerator							
Total Aeration Time (min)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Total Settling Time (min)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Air Flow Rate (cfm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Collision Chamber							
Avg. Sediment Inlet Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Sediment Inlet Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. High Pressure Water Inlet Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
High Pressure Water Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Cavitation/Oxidation Unit							
Avg. Sediment Inlet Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Cav/Ox Unit Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Cav/Ox Unit Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Hydrogen Peroxide Dosage (gal)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Sodium Percarbonate (kg/batch)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Recycle Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Cav/Ox Duration (min)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Hydrocyclone							
Sediment Inlet Pressure (psig)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Sediment Inlet Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge							
Sediment Flow Rate to Centrifuge (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Pond Depth Setting	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Centrifuge Bowl Speed (rpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Conveyor Speed (rpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO
Centrifuge Centrate Flow Rate (gpm)	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO	NR-NO

Table C-2

Testing Phase Analytical Results

Control Variable	Sediment Tanks							Baseline Conditions					
Degree of Variance	100% of Standard Operating Parameters							100% of Standard Operating Parameters					
Batch Number	NA							Batch 1					
Sample ID	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5	Tank 6	Tank 7	PPI-01-01-01	PPO-01-01-01	AER-01-01-01	CCO-01-01-01	OXO-01-01-01	PSD-01-01-01
Percent Moisture (%)	68.6	68.9	68.1	70.4	68.9	68.7	67.5	66.7	76.5	77.9	82.2	81.6	33.0
TRPH (mg/kg)	-	-	-	-	-	-	431	260	131	187	426	278	223
PAHs (ug/kg)													
Acenaphthylene	-	-	-	-	-	-	180 J	500 U	7000 U	3000 U	3700 U	9000 U	980 U
Naphthalene	-	-	-	-	-	-	-	500 U	7000 U	3000 U	3700 U	9000 U	980 U
Acenaphthene	-	-	-	-	-	-	-	500 U	7000 U	3000 U	3700 U	9000 U	980 U
Fluorene	-	-	-	-	-	-	-	500 U	7000 U	3000 U	3700 U	9000 U	980 U
Phenanthrene	-	-	-	-	-	-	670	450 J	7000 U	3000 U	3700 U	9000 U	530 J
Anthracene	-	-	-	-	-	-	450 J	330 J	7000 U	3000 U	3700 U	9000 U	980 U
Fluoranthene	-	-	-	-	-	-	1900	1400	7000 U	1300 J	3700 U	9000 U	1400
Pyrene	-	-	-	-	-	-	1600	1200	7000 U	1000 J	3700 U	9000 U	1300
Benzo(a)anthracene	-	-	-	-	-	-	860	670	7000 U	3000 U	3700 U	9000 U	850 J
Chrysene	-	-	-	-	-	-	930	730	7000 U	3000 U	3700 U	9000 U	930 J
Benzo(b)fluoranthene	-	-	-	-	-	-	590	510	7000 U	3000 U	3700 U	9000 U	580 J
Benzo(k)fluoranthene	-	-	-	-	-	-	810	610	7000 U	3000 U	3700 U	9000 U	740 J
Benzo(a)pyrene	-	-	-	-	-	-	900	690	7000 U	3000 U	3700 U	9000 U	610 J
Indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	630	480 J	7000 U	3000 U	3700 U	9000 U	700 J
Dibenz(a,h)anthracene	-	-	-	-	-	-	240 J	500 U	7000 U	3000 U	3700 U	9000 U	980 U
Benzo(ghi)perylene	-	-	-	-	-	-	740	560	7000 U	3000 U	3700 U	9000 U	810 J
Metals (mg/kg)													
Silver	-	-	-	-	-	-	3.9	3.7	4.0	4.6	5.0	4.9	0.33
Arsenic	-	-	-	-	-	-	14.5	13.5	15.0	17.4	19.2	17.8	2.6
Beryllium	-	-	-	-	-	-	0.82	1.1 B	0.82	1.1	1.2	1.1	0.13 B
Cadmium	-	-	-	-	-	-	3.3	3.1	3.3	3.8	4.2	4.1	0.38
Chromium	-	-	-	-	-	-	137 MBB	158 MBB	147 MBB	169 MBB	182 MBB	184 MBB	15.1 MBB
Copper	-	-	-	-	-	-	137 MBB	156 MBB	149 MBB	164 MBB	180 MBB	178 MBB	14.3 MBB
Nickel	-	-	-	-	-	-	33.1	37.2	36.9	40.7	44.0	44.1	7.7
Lead	-	-	-	-	-	-	169	161	179	195	214	206	21.4
Antimony	-	-	-	-	-	-	0.086 B	0.15 B	0.18 B	0.15 B	0.17 B	0.11 B	0.030 B
Selenium	-	-	-	-	-	-	2.2	2.0	2.3	2.7	3.5	2.9	0.43 B
Thallium	-	-	-	-	-	-	0.27 B	0.26 B	0.28 B	0.32 B	0.34 B	0.34 B	0.058 B
Zinc	-	-	-	-	-	-	308	287	320	364	390	376	46.5
Mercury	-	-	-	-	-	-	4.9	4.8	6.8	5.4	7.9	6.5	2.5

Table C-2

Testing Phase Analytical Results

Control Variable	Sediment Flow Rate to Pre-Processor				HP Water Flow Rate to Pre-Processor			
Degree of Variance	14% (20 gpm)		77% (108 gpm)		50% (30 gpm)		75% (45 gpm)	
Batch Number	Batch 2				Batch 3		Batch 4	
Sample ID	PPI-02-01-01	PPO-02-01-01	PPI-02-02-01	PPO-02-02-01	PPI-03-01-01	PPO-03-01-01	PPI-04-01-01	PPO-04-01-01
Percent Moisture (%)	64.2	70.8	64.4	69.5	67.7	71.9	68.4	74.6
TRPH (mg/kg)	1100	266	1200	597	1100	950	908	946
PAHs (ug/kg)								
Acenaphthylene	250 J	1100 U	240 J	1100 U	410 J	440 J	450 J	450 J
Naphthalene	920 U	1100 U	930 U	1100 U	1000 U	1200 U	1000 U	1300 U
Acenaphthene	920 U	1100 U	930 U	1100 U	240 J	220 J	250 J	410 J
Fluorene	190 J	1100 U	930 U	1100 U	1000 U	1200 U	1000 U	410 J
Phenanthrene	790 J	310 J	790 J	510 J	850 J	940 J	990 J	2600
Anthracene	540 J	1100 U	590 J	370 J	650 J	750 J	750 J	1200 J
Fluoranthene	2300	910 J	2400	1500	2500	2600	2700	4600
Pyrene	1600	880 J	1700	1100	2100	2200	2200	3300
Benzo(a)anthracene	1100	560 J	1100	720 J	1200	1300	1400	2000
Chrysene	1100	590 J	1200	800 J	1300	1500	1400	2100
Benzo(b)fluoranthene	670 J	1100 U	980	580 J	890 J	1000 J	950 J	1700
Benzo(k)fluoranthene	720 J	1100 U	730 J	410 J	1000	910 J	970 J	1600
Benzo(a)pyrene	980	480 J	1100	730 J	1300	1300	1300	1900
Indeno(1,2,3-cd)pyrene	680 J	490 J	740 J	510 J	970 J	990 J	920 J	1400
Dibenz(a,h)anthracene	920 U	1100 U	930 U	1100 U	360 J	330 J	330 J	440 J
Benzo(ghi)perylene	850 J	550 J	880 J	560 J	1200	1300	1100	1400
Metals (mg/kg)								
Silver	3.7	3.0	3.4	3.7	3.8	3.8	3.6	3.8
Arsenic	13.3	10.3	12.8	13.6	14.4	13.8	13.9	14.1
Beryllium	0.84 B	0.65	0.64 B	0.83 B	0.88 B	1.1 B	1.0 B	0.96 B
Cadmium	2.9	2.4	2.8	3.0	3.2	3.1	3.1	3.1
Chromium	148 MBB	111 MBB	142 MBB	149 MBB	159	158	153	154
Copper	142 MBB	118 MBB	134 MBB	143 MBB	156	150	148	149
Nickel	34.8	25.7	33.1	34.7	38.7	37.7	36.0	37.0
Lead	153	119	143	148	164	156	156	158
Antimony	0.13 B	0.13 B	0.068 B	0.080 B	0.17 B	0.20 B	0.13 B	0.11 B
Selenium	2.3	1.6 B	2.4	2.5	2.2	2.2	2.3	2.3
Thallium	0.26 B	0.19 B	0.24 B	0.25 B	0.29 B	0.27 B	0.26 B	0.27 B
Zinc	274	221	259	286	292	282	281	282
Mercury	4.2	3.3	5.1	4.3	5.6	5.7	5.1	5.1

Table C-2

Testing Phase Analytical Results

Control Variable	Aeration Time				Chelating Agent Quantity		HP Water Flow Rate to Collision Chamber	
Degree of Variance	Initial Conditions	0% (0 min)	100% (15 min)	400% (60 min)	50% (1.5 kg)		75% (45 gpm)	
Batch Number	Batch 5				Batch 6		Batch 7	
Sample ID	AER-05-01-01	CCO-05-01-01	CCO-05-02-01	CCO-05-03-01	CC0-06-01-01	OXO-06-01-01	AER-07-01-01	CCO-07-01-01
Percent Moisture (%)	75.0	73.3	80.5	79.2	79.6	81.2	79.2	75.6
TRPH (mg/kg)	1300	837	1170	892	784	636	1150	2510
PAHs (ug/kg)								
Acenaphthylene	520 J	410 J	720 J	590 J	510 J	460 J	500 J	450 J
Naphthalene	1300 U	1200 U	1700 U	1600 U	1600 U	1800 U	1600 U	1400 U
Acenaphthene	360 J	310 J	340 J	290 J	1600 U	1800 U	1600 U	230 J
Fluorene	300 J	350 J	1700 U	1600 U	1600 U	1800 U	1600 U	1400 U
Phenanthrene	1800	1700	1600 J	1300 J	1000 J	960 J	1200 J	960 J
Anthracene	1000 J	960 J	1000 J	940 J	740 J	780 J	790 J	680 J
Fluoranthene	4100	3700	4400	3800	3100	2900	3500	2900
Pyrene	2800	2600	3100	2800	2100	1900	2500	1900
Benzo(a)anthracene	1800	1500	1700	1900	1500 J	1300 J	1500 J	1200 J
Chrysene	1900	1700	2000	2100	1600	1500 J	1800	1400
Benzo(b)fluoranthene	1500	1200	1400 J	1200 J	980 J	1000 J	1000 J	980 J
Benzo(k)fluoranthene	1300	1300	1700	1600	1300 J	1100 J	1400 J	1100 J
Benzo(a)pyrene	1800	1500	2000	1800	1500 J	1400 J	1600	1300 J
Indeno(1,2,3-cd)pyrene	1200 J	1100 J	1200 J	1000 J	850 J	770 J	840 J	710 J
Dibenz(a,h)anthracene	470 J	410 J	610 J	410 J	1600 U	1800 U	1600 U	1400 U
Benzo(ghi)perylene	1400	1200	1400 J	1100 J	930 J	860 J	900 J	740 J
Metals (mg/kg)								
Silver	3.8	3.0	3.9	4.9	4.1	4.5	3.9	3.9
Arsenic	14.8	11.0	14.3	17.1	15.1	15.5	14.4	14.9
Beryllium	1.0 B	0.58	0.85	0.90 B	0.76 B	0.78 B	0.91 B	0.61 B
Cadmium	3.5	2.5	3.6	3.9	4.1	3.3	3.8	3.3
Chromium	163	108	142	193 MBB	167 MBB	167 MBB	163 MBB	162 MBB
Copper	163	104	134	184	159	156	151	149
Nickel	39.4	26.4	34.1	45.6	38.5	39.1	36.2	38.0
Lead	161	123	159	192	173	166	160	165
Antimony	0.13 B	0.094 B	0.12 B	0.27 B	0.16 B	0.23 B	0.18 B	0.14 B
Selenium	2.3	1.8 B	2.4 B	3.0	3.0	3.0	2.9	3.2
Thallium	0.27 B	0.21 B	0.26 B	0.32 B	0.28 B	0.28 B	0.26 B	0.27 B
Zinc	293	222	284	354	311	311	292	299
Mercury	4.4	3.7	5.1	4.6	6.4	4.8	5.3	4.9

Table C-2

Testing Phase Analytical Results

Control Variable	Sediment Flow Rate to Collision Chamber				
Degree of Variance	Initial Conditions	70% (175 gpm)	56% (140 gpm)	110% (275 gpm)	
Batch Number	Batch 8			Batch 9	
Sample ID	AER-08-01-01	CCO-08-01-01	CCO-08-02-01	AER-09-01-01	CCO-09-01-01
Percent Moisture (%)	75.7	72.6	83.0	75.9	79.6
TRPH (mg/kg)	1510	1020	1860	1040	1080
PAHs (ug/kg)					
Acenaphthylene	320 J	520 J	880 J	430 J	390 J
Naphthalene	1400 U	1200 U	1900 U	1400 U	1600 U
Acenaphthene	1400 U	210 J	420 J	1400 U	1600 U
Fluorene	1400 U	1200 U	510 J	1400 U	1600 U
Phenanthrene	540 J	760 J	2200	920 J	670 J
Anthracene	460 J	660 J	2400	690 J	540 J
Fluoranthene	1600	2500	4600	2600	1900
Pyrene	1200 J	1500	2400	1800	1400 J
Benzo(a)anthracene	790 J	1100 J	2000	1300 J	950 J
Chrysene	940 J	1300	2400	1400	1100 J
Benzo(b)fluoranthene	670 J	790 J	1400 J	820 J	670 J
Benzo(k)fluoranthene	500 J	1000 J	1900	970 J	890 J
Benzo(a)pyrene	870 J	1300	2200	1300 J	1100 J
Indeno(1,2,3-cd)pyrene	660 J	660 J	1200 J	760 J	710 J
Dibenz(a,h)anthracene	1400 U	1200 U	450	1400 U	1600 U
Benzo(ghi)perylene	780 J	770 J	1300 J	890 J	800 J
Metals (mg/kg)					
Silver	4.3	3.8	5.4	4.6	4.7
Arsenic	14.7	13.1	19.7	16.0	17.1
Beryllium	1.0 B	0.73	0.98	0.82	0.84
Cadmium	3.3	4.9	5.0	3.7	4.8
Chromium	162 MBB	128 MBB	185 MBB	152 MBB	162 MBB
Copper	162	132	186	156	168
Nickel	39.3	33.0	45.3	38.1	40.3
Lead	183	162	229	197	201
Antimony	0.22 B	0.17 B	0.14 B	0.11 B	0.11 B
Selenium	2.7	2.2	3.4	3.3	3.2
Thallium	0.30 B	0.27 B	0.38 B	0.33 B	0.34 B
Zinc	300	280	395	328	350
Mercury	6.6	5.5	7.1	5.8	6.90

Table C-2

Testing Phase Analytical Results

Control Variable	Sediment Flow Rate to Hydrocyclone							Centrifuge Bowl Speed			
Degree of Variance	Initial Conditions	100% (60 gpm)		82% (49 gpm)		102% (61 gpm)		81% (2,600 RPM)		125% (4,000 RPM)	
Batch Number	Batch 10										
Sample ID	OXO-10-01-01	HYU-10-01-01	HYO-10-01-01	HYU-10-02-01	HYO-10-02-01	HYU-10-03-01	HYO-10-03-01	PSD-10-04-01	PAQ-10-04-01	PSD-10-05-01	PAQ-10-05-01
Percent Moisture (%)	80.3	46.0	82.3	42.5	82.2	52.5	82.5	30.8	90.9	31.8	90.7
TRPH (mg/kg)	1010	510	881	-	-	-	-	-	-	-	-
PAHs (ug/kg)											
Acenaphthylene	440 J	150 J	1900 U	-	-	-	-	-	-	-	-
Naphthalene	1700 U	610 U	1900 U	-	-	-	-	-	-	-	-
Acenaphthene	1700 U	120 J	1900 U	-	-	-	-	-	-	-	-
Fluorene	1700 U	110 J	1900 U	-	-	-	-	-	-	-	-
Phenanthrene	960 J	660	700 J	-	-	-	-	-	-	-	-
Anthracene	650 J	330 J	510 J	-	-	-	-	-	-	-	-
Fluoranthene	2600	1500	1800 J	-	-	-	-	-	-	-	-
Pyrene	2000	1200	1400 J	-	-	-	-	-	-	-	-
Benzo(a)anthracene	1200 J	650	860 J	-	-	-	-	-	-	-	-
Chrysene	1400 J	810	970 J	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	1200 J	580 J	810 J	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	900 J	600 J	670 J	-	-	-	-	-	-	-	-
Benzo(a)pyrene	1500 J	830	1000 J	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	910 J	620	740 J	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	570 J	230 J	1900 U	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	1200 J	740	920 J	-	-	-	-	-	-	-	-
Metals (mg/kg)											
Silver	6.1	0.96	6.3	-	-	-	-	-	-	-	-
Arsenic	22.9	7.6	22.9	-	-	-	-	-	-	-	-
Beryllium	1.2	0.32	1.1	-	-	-	-	-	-	-	-
Cadmium	4.9	1.1	5.1	-	-	-	-	-	-	-	-
Chromium	213	42.0	227	-	-	-	-	-	-	-	-
Copper	231	50.8	221	-	-	-	-	-	-	-	-
Nickel	55.2	21.0	51.3	-	-	-	-	-	-	-	-
Lead	250	69.8	267	-	-	-	-	-	-	-	-
Antimony	0.30 B	0.13 B	0.25 B	-	-	-	-	-	-	-	-
Selenium	2.5	0.73 B	2.9	-	-	-	-	-	-	-	-
Thallium	0.42 B	0.15 B	0.42 B	-	-	-	-	-	-	-	-
Zinc	462	127	468	-	-	-	-	-	-	-	-
Mercury	7.1	2.4	6.8	-	-	-	-	-	-	-	-

Table C-2

Testing Phase Analytical Results

Control Variable	Centrifuge Differential Pressure						
Degree of Variance	100% (32 psi)		163% (52 psi)		63% (20 psi)		
Batch Number	Batch 10						
Sample ID	PSD-10-06-01	PAQ-10-06-01	PSD-10-07-01	PAQ-10-07-01	PSD-10-08-01	PAQ-10-08-01	PSD-10-08-02
Percent Moisture (%)	31.2	90.8	31.5	90.6	33.5	90.8	53.2
TRPH (mg/kg)	521	1120	-	-	191	-	690
PAHs (ug/kg)							
Acenaphthylene	500	3600 U	-	-	-	-	-
Naphthalene	180 J	3600 U	-	-	-	-	-
Acenaphthene	130 J	3600 U	-	-	-	-	-
Fluorene	130 J	3600 U	-	-	-	-	-
Phenanthrene	730	830 J	-	-	-	-	-
Anthracene	570	3600 U	-	-	-	-	-
Fluoranthene	2100	1800 J	-	-	-	-	-
Pyrene	1500	1500 J	-	-	-	-	-
Benzo(a)anthracene	1300	680 J	-	-	-	-	-
Chrysene	1400	960 J	-	-	-	-	-
Benzo(b)fluoranthene	970	550 J	-	-	-	-	-
Benzo(k)fluoranthene	1200	3600 U	-	-	-	-	-
Benzo(a)pyrene	1600	710 J	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	1000	3600 U	-	-	-	-	-
Dibenz(a,h)anthracene	530	3600 U	-	-	-	-	-
Benzo(ghi)perylene	1200	620 J	-	-	-	-	-
Metals (mg/kg)							
Silver	1.3	8.4	-	-	-	-	-
Arsenic	10.4	22.8	-	-	-	-	-
Beryllium	0.49 B	1.3	-	-	-	-	-
Cadmium	1.6	6.4	-	-	-	-	-
Chromium	60.9	319	-	-	-	-	-
Copper	60.1	310	-	-	-	-	-
Nickel	30.8	51.2	-	-	-	-	-
Lead	82.9	322	-	-	-	-	-
Antimony	0.41	1.1 U	-	-	-	-	-
Selenium	0.92	3.1 B	-	-	-	-	-
Thallium	0.25	0.36 B	-	-	-	-	-
Zinc	163	580	-	-	-	-	-
Mercury	0.2 U	9.6	-	-	-	-	-

Table C-2

Testing Phase Analytical Results

Control Variable	Sediment Flow Rate to Centrifuge				Sodium Percarbonate Quantity at Pre-Processor		Surfactant and Defoamer Quantity (S-11 through S-14)	
Degree of Variance	64% (32 gpm)		134% (67 gpm)		50% (2 kg)		50% (1 kg of each)	
Batch Number	Batch 10				Batch 11		Batch 12	
Sample ID	PSD-10-09-01	PAQ-10-09-01	PSD-10-10-01	PAQ-10-10-01	CCO-11-01-01	OXO-11-01-01	CCO-12-01-01	OXO-12-01-01
Percent Moisture (%)	29.1	91.6	28.8	92.1	80.1	79.7	96.5	70.6
TRPH (mg/kg)	-	-	-	-	852	760	2200	496
PAHs (ug/kg)								
Acenaphthylene	-	-	-	-	380 J	370 J	2100 J	1100 U
Naphthalene	-	-	-	-	1700 U	1600 U	9300 U	1100 U
Acenaphthene	-	-	-	-	1700 U	1600 U	9300 U	1100 U
Fluorene	-	-	-	-	1700 U	1600 U	9300 U	1100 U
Phenanthrene	-	-	-	-	870 J	720 J	2900 J	1100 U
Anthracene	-	-	-	-	630 J	600 J	2400 J	1100 U
Fluoranthene	-	-	-	-	2500	2200	10000	310 J
Pyrene	-	-	-	-	1900	1800	7800 J	280 J
Benzo(a)anthracene	-	-	-	-	1000 J	1000 J	5800 J	1100 U
Chrysene	-	-	-	-	1300 J	1200 J	6700 J	210 J
Benzo(b)fluoranthene	-	-	-	-	950 J	890 J	4300 J	1100 U
Benzo(k)fluoranthene	-	-	-	-	1000 J	830 J	5300 J	1100 U
Benzo(a)pyrene	-	-	-	-	1300 J	1200 J	7000 J	230 J
Indeno(1,2,3-cd)pyrene	-	-	-	-	790 J	780 J	4900 J	1100 U
Dibenz(a,h)anthracene	-	-	-	-	480 J	1600 U	2400 J	1100 U
Benzo(ghi)perylene	-	-	-	-	950 J	1100 J	5500 J	1100 U
Metals (mg/kg)								
Silver	-	-	-	-	6.0	5.7	26.0	3.1
Arsenic	-	-	-	-	21.0	21.0	106	11.6
Beryllium	-	-	-	-	0.85 B	1.0	6.0	0.71
Cadmium	-	-	-	-	4.7	4.8	22.9	2.7
Chromium	-	-	-	-	230	204	953	121
Copper	-	-	-	-	231	205	957	120
Nickel	-	-	-	-	56.2	48.9	265	28.5
Lead	-	-	-	-	237	242	1160	138
Antimony	-	-	-	-	1.4	0.26 B	0.66 B	0.067 B
Selenium	-	-	-	-	2.1 B	2.3 B	10.3 B	1.4 B
Thallium	-	-	-	-	0.39 B	0.39 B	2.1 B	0.23 B
Zinc	-	-	-	-	438	437	2130	252
Mercury	-	-	-	-	6	5.9	1.8	0.32

Table C-2

Testing Phase Analytical Results

Control Variable	Hydrogen Peroxide Quantity at Cav/Ox Unit				Recycle Duration at Cav/Ox Unit				Pre-Processor and Venturi Flow Inhibitor	
Degree of Variance	43% (1.03 gph)		101% (2.43 gph)		Initial Conditions	50% (30 min)	100% (60 min)	200% (120 min)	Switch Inline Positions	
Batch Number	Batch 13		Batch 14		Batch 15				Batch 16	
Sample ID	CCO-13-01-01	OXO-13-01-01	CCO-14-01-01	OXO-14-01-01	CCO-15-01-01	OXO-15-01-01	OXO-15-02-01	OXO-15-03-01	PPI-16-01-01	PPO-16-01-01
Percent Moisture (%)	83.3	82.9	82.0	80.7	80.1	80.1	81.2	81.1	69.7	75.3
TRPH (mg/kg)	1840	1160	901	1300	751	1100	1550	469 B	814	660
PAHs (ug/kg)										
Acenaphthylene	2000 U	1900 U	920 U	860 U	830 U	830 U	880 U	870 U	310 J	1300 U
Naphthalene	2000 U	1900 U	920 U	860 U	830 U	830 U	880 U	870 U	1100 U	1300 U
Acenaphthene	2000 U	1900 U	920 U	860 U	830 U	830 U	880 U	870 U	270 J	1300 U
Fluorene	2000 U	1900 U	920 U	130	130 U	130 U	130 U	130 U	1100 U	1300 U
Phenanthrene	2000 U	1900 U	540	590	510	510	450	500	970 J	1300 U
Anthracene	2000 U	1900 U	330	380	310	310	270	300	550 J	1300 U
Fluoranthene	2000 U	1900 U	1600	1900	1500	1500	1400	1600	2700	500 J
Pyrene	2000 U	1900 U	1000	1200	1000	920	840	1000	1900	370 J
Benzo(a)anthracene	2000 U	1900 U	680	730	640	580	550	670	1200	370 J
Chrysene	2000 U	1900 U	820	910	680	720	630	790	1300	410 J
Benzo(b)fluoranthene	2000 U	1900 U	900	1000	800	790	760	910	1400	330 J
Benzo(k)fluoranthene	2000 U	1900 U	410	410	420	330	300	410	1000 J	1300 U
Benzo(a)pyrene	2000 U	1900 U	1200	1300	1000	1000	760	1100	1400	400 J
Indeno(1,2,3-cd)pyrene	2000 U	1900 U	570	620	590	480	440	550	760 J	1300 U
Dibenz(a,h)anthracene	2000 U	1900 U	140 U	130 U	130 U	130 U	130 U	130 U	1100 U	1300 U
Benzo(ghi)perylene	2000 U	1900 U	600	620	600	470	430	570	880 J	210 J
Metals (mg/kg)										
Silver	4.5	5.7	4.2 B	3.7 B	3.9 B	4.2 B	3.9 B	3.7 B	4.1	4.4
Arsenic	17.2	22.1	18.7	17.5	16.3	19.4	17.0	16.7	15	16.1
Beryllium	0.92	1.2	1.5 B	1.6 B	1.4 B	1.6 B	1.6 B	1.4 B	0.87	0.91
Cadmium	3.8	4.9	3.5	3.2	3.1	3.6	3.4	3.0	3.4	3.6
Chromium	171	219	188	173	164	200	185	168	168	181
Copper	168 MBB	213 MBB	189	169	162	197	185	166	179 MBB	189 MBB
Nickel	41.5	54.1	42.6	42.9	39.4	47.5	45.6	40.4	38.2	39.6
Lead	196	256	190	173	163	195	184	168	175	189
Antimony	0.44 B	0.22 B	33.3 U	31.1 U	30.1 U	30.2 U	31.9 U	31.7 U	0.18 B	0.18 B
Selenium	2.1 B	2.9 B	2.9	2.6 U	1.5 B	1.5 B	1.7 B	1.3 B	3.2	3.5
Thallium	0.33 B	0.42 B	5.5 U	5.2 U	5.0 U	5.0 U	5.3 U	5.3 U	0.25 B	0.29 B
Zinc	358	458	352	328	305	372	355	358	305	332
Mercury	5.5	6.1	3.6	3.5	3.6	3.5	3.7	3.7	4.3	4.6

Table C-2

Testing Phase Analytical Results

Control Variable	Surfactant Quantity						
Degree of Variance	0% (0 kg)						
Batch Number	Batch 17						
Sample ID	PPI-17-01-01	PPO-17-01-01	AER-17-01-01	CCO-17-01-01	OXO-17-01-01	PSD-17-01-01	PAQ-17-01-01
Percent Moisture (%)	69.9	76.8	77.5	83.0	83.8	30.9	92.0
TRPH (mg/kg)	894	823	564	1060	1210	429	1330
PAHs (ug/kg)							
Acenaphthylene	1100 U	1400 U	1500 U	1900 U	2000 U	190 J	4100 U
Naphthalene	1100 U	1400 U	1500 U	1900 U	2000 U	480	4100 U
Acenaphthene	1100 U	1400 U	1500 U	1900 U	2000 U	130 J	4100 U
Fluorene	1100 U	1400 U	1500 U	1900 U	2000 U	130 J	4100 U
Phenanthrene	310 J	280 J	290 J	370 J	410 J	560	4100 U
Anthracene	1100 U	1400 U	1500 U	1900 U	2000 U	300 J	4100 U
Fluoranthene	620 J	680 J	840 J	980 J	970 J	1400	4100 U
Pyrene	620 J	620 J	720 J	820 J	900 J	1100	710 J
Benzo(a)anthracene	390 J	380 J	490 J	600 J	610 J	840	4100 U
Chrysene	470 J	400 J	620 J	670 J	680 J	840	4100 U
Benzo(b)fluoranthene	360 J	280 J	440 J	550 J	390 J	850	4100 U
Benzo(k)fluoranthene	380 J	440 J	470 J	1900 U	550 J	640	4100 U
Benzo(a)pyrene	490 J	440 J	560 J	670 J	670 J	920	4100 U
Indeno(1,2,3-cd)pyrene	250 J	1400 U	1500 U	1900 U	2000 U	590	4100 U
Dibenz(a,h)anthracene	1100 U	1400 U	1500 U	1900 U	2000 U	180 J	4100 U
Benzo(ghi)perylene	320 J	300 J	330 J	370 J	320 J	750	4100 U
Metals (mg/kg)							
Silver	4.1	4.5	4.6	4.6	5.8	0.32	8.3
Arsenic	14.7	16.2	15.5	15.4	19.9	2.3	21.4
Beryllium	0.76	0.93	0.91	0.85	1.1	0.085 B	1.2 B
Cadmium	3.3	3.5	3.6	3.7	4.4	0.39	6.0
Chromium	169 MBB	178 MBB	177 MBB	176 MBB	225 MBB	16.0 MBB	316 MBB
Copper	168	174	172	173	225	14.1	314
Nickel	38.7	40.4	39.9	41.3	52.1	7.1	49.9
Lead	170	183	184	184	237	21.6	312
Antimony	0.13 B	0.12 B	0.063 B	0.052 B	0.055 B	0.031 B	0.11 B
Selenium	3.2	3.7	3.5	3.8	3.7	0.66 B	6.3
Thallium	0.27 B	0.27 B	0.29 B	0.27 B	0.35 B	0.053 B	0.28 B
Zinc	310	322	318	325	396	46.0	515
Mercury	3.8	4.0	4.7	4.9	5.2	1.6	6.6

Table C-2

Testing Phase Analytical Results

Control Variable	Chelating Agent Quantity						
Degree of Variance	0% (0 kg)						
Batch Number	Batch 18						
Sample ID	PPI-18-01-01	PPO-18-01-01	AER-18-01-01	CCO-18-01-01	OXO-18-01-01	PSD-18-01-01	PAQ-18-01-01
Percent Moisture (%)	68.8	75.8	76.4	80.7	81.6	27.7	91.5
TRPH (mg/kg)	1180	1190	1300	1370	1950	162	1110
PAHs (ug/kg)							
Acenaphthylene	1100 U	1400 U	1400 U	1700 U	390 J	460	3900 U
Naphthalene	1100 U	1400 U	1400 U	1700 U	1800 U	280 J	3900 U
Acenaphthene	1100 U	1400 U	1400 U	1700 U	1800 U	160 J	3900 U
Fluorene	1100 U	1400 U	1400 U	1700 U	1800 U	150 J	3900 U
Phenanthrene	630 J	1400 U	1400 U	1700 U	790 J	980	3900 U
Anthracene	450 J	1400 U	1400 U	1700 U	660 J	570	3900 U
Fluoranthene	2100	760 J	680 J	840 J	2700	2500	960 J
Pyrene	1600	670 J	650 J	710 J	2200	1900	880 J
Benzo(a)anthracene	960 J	460 J	460 J	510 J	1200 J	1300	3900 U
Chrysene	1100	520 J	500 J	530 J	1500 J	1400	3900 U
Benzo(b)fluoranthene	1000 J	450 J	440 J	510 J	1100 J	960	3900 U
Benzo(k)fluoranthene	860 J	440 J	410 J	1700 U	1200 J	890	3900 U
Benzo(a)pyrene	1200	500 J	500 J	520 J	1500 J	1200	3900 U
Indeno(1,2,3-cd)pyrene	550 J	1400 U	1400 U	1700 U	850 J	1000	3900 U
Dibenz(a,h)anthracene	1100 U	1400 U	1400 U	1700 U	1800 U	320 J	3900 U
Benzo(ghi)perylene	650 J	310 J	300 J	320 J	1100 J	1200	3900 U
Metals (mg/kg)							
Silver	4.3	4.4	4.4	4.4	4.7	0.13 B	8.9
Arsenic	15.3	15.4	15.8	16.3	16.3	0.82	23.5
Beryllium	0.86	0.86	0.90	0.92	1.0	0.046 B	1.5
Cadmium	3.6	3.5	3.5	3.6	3.6	0.20	5.8
Chromium	173 MBB	170 MBB	177 MBB	183 MBB	190	5.4	340
Copper	185	169	173	179	183	6.4	326
Nickel	39.4	39.4	40.0	41.9	42.2	2.5	54.2
Lead	180	185	183	192	186	6.9	325
Antimony	0.062 B	0.036 B	0.12 B	0.074 B	0.23 B	0.026 B	0.34 B
Selenium	3.2	3.2	3.0	3.6	3.3	0.48 B	6.6
Thallium	0.27 B	0.28 B	0.28 B	0.28 B	0.23 B	0.14 U	0.21 B
Zinc	319	311	315	325	330	20.1	540
Mercury	3.7	3.6	3.6	4.2	5.5	0.78	8.3

Table C-2

Testing Phase Analytical Results

Control Variable	Baseline Conditions								
Degree of Variance	100% of Standard Operating Parameters								
Batch Number	Batch 19								
Sample ID	PPI-19-01-01	PPO-19-01-01	AER-19-01-01	CCO-19-01-01	OXO-19-01-01	PSD-19-01-01	PAQ-19-01-01	SSD-19-01-01	SAQ-19-01-01[(1)]
Percent Moisture (%)	68.8	76.7	76.4	80.4	74.0	28.4	91.6	70.4	-
TRPH (mg/kg)	903	1820	897	690	768	218	852	8910	24.0
PAHs (ug/kg)									
Acenaphthylene	530 J	490 J	480 J	1700 U	1300 U	180 J	3900 U	200 J	10 U
Naphthalene	1100 U	1400 U	1400 U	1700 U	1300 U	220 J	3900 U	1100	10 U
Acenaphthene	250 J	260 J	1400 U	1700 U	1300 U	130 J	3900 U	310 J	10 U
Fluorene	200 J	1400 U	1400 U	1700 U	1300 U	120 J	3900 U	330 J	10 U
Phenanthrene	850 J	1000 J	830 J	970 J	520 J	550	3900 U	1000 J	10 U
Anthracene	730 J	740 J	650 J	620 J	280 J	370 J	3900 U	620 J	10 U
Fluoranthene	2400	2400	2300	2900	1400	1600	3900 U	2600	10 U
Pyrene	1700	1800	1600	1900	950 J	1100	3900 U	1700	10 U
Benzo(a)anthracene	1200	1100 J	1100 J	1300 J	620 J	850	3900 U	810 J	10 U
Chrysene	1300	1300 J	1200 J	1300 J	690 J	940	3900 U	980 J	10 U
Benzo(b)fluoranthene	880 J	900 J	830 J	1000 J	590 J	750	3900 U	750 J	10 U
Benzo(k)fluoranthene	970 J	790 J	900 J	950 J	420 J	750	3900 U	770 J	10 U
Benzo(a)pyrene	1200	1100 J	1100 J	1300 J	640 J	1000	3900 U	840 J	10 U
Indeno(1,2,3-cd)pyrene	740 J	710 J	750 J	750 J	440 J	690	3900 U	560 J	10 U
Dibenz(a,h)anthracene	290 J	1400 U	1400 U	1700 U	1300 U	280 J	3900 U	1100 U	10 U
Benzo(ghi)perylene	830 J	820 J	760 J	1000 J	620 J	870	3900 U	760 J	10 U
Metals (mg/kg)									
Silver	4.0	4.5	4.2	4.6	3.5	0.30	8.6	7.5	0.43 B
Arsenic	14.3	15.9	15.3	15.5	11.7	2.1	21.3	19.3	46.8
Beryllium	0.76	0.92	0.81	0.84	0.78	0.11 B	1.3	1.3	1.0 U
Cadmium	3.2	3.5	3.2	3.5	2.7	0.31	6.3	5.6	0.46 B
Chromium	157	173	157	185 MBB	140 MBB	13.2 MBB	325 MBB	288 MBB	26.1
Copper	158	174	156	184 MBB	136 MBB	12.6 MBB	322 MBB	272 MBB	17.7
Nickel	36.1	39.4	36.0	42.6	32.1	6.8	51.8	48.0	224
Lead	169	182	168	188	143	18.3	324	270	23.3
Antimony	0.054 B	0.058 B	0.070 B	0.19 B	0.11 B	0.036 B	0.11 B	0.036 B	9.2
Selenium	3.1	3.4	3.1	2.8	2.1	0.58 B	6.2	2.8	59.3
Thallium	0.20 B	0.22 B	0.19 B	0.30 B	0.22 B	0.048 B	0.29 B	0.29 B	1.0 U
Zinc	293	325	303	319	246	37.1	538	482	74.7
Mercury	4.4	4.4	4.1	3.3	2.3	1.5	6.0	5.6	0.20 U

Table C-2

Testing Phase Analytical Results

Control Variable	Addition of New Surfactant (S-15)							Retreatment of Sludge from 100% Run (Batch 19)		
Degree of Variance	4 kg S-12 and 4 kg S-15							Sludge Rewatered and Sent Through Pre-Processor		
Batch Number	Batch 20							Batch 21		
Sample ID	PPI-20-01-01	PPO-20-01-01	AER-20-01-01	CCO-20-01-01	OXO-20-01-01	PSD-20-01-01	PAQ-20-01-01	PPI-21-01-01	PSD-21-01-01	PAQ-21-01-01
Percent Moisture (%)	66.8	70.8	76.4	82.0	81.2	29.1	91.7	76.2	20.4	97.5
TRPH (mg/kg)	1190	1020	483	353	887	133	650	188	89.9	456 B
PAHs (ug/kg)										
Acenaphthylene	250 J	220 J	1400 U	1800 U	1800 U	220 J	4000 U	1400 U	130 J	13000 U
Naphthalene	990 U	1100 U	1400 U	1800 U	1800 U	250 J	4000 U	1400 U	170 J	13000 U
Acenaphthene	240 J	1100 U	1400 U	1800 U	1800 U	120 J	4000 U	1400 U	97 J	13000 U
Fluorene	260 J	1100 U	1400 U	1800 U	1800 U	130 J	4000 U	1400 U	100 J	13000 U
Phenanthrene	810 J	550 J	1400 U	1800 U	500 J	640	4000 U	400 J	510	13000 U
Anthracene	620 J	410 J	1400 U	1800 U	340 J	390 J	4000 U	280 J	300 J	13000 U
Fluoranthene	2500	1800	510 J	490 J	1400 J	1900	4000 U	1200 J	1300	13000 U
Pyrene	1500	950 J	420 J	440 J	840 J	1300	4000 U	920 J	1000	13000 U
Benzo(a)anthracene	1100	750 J	330 J	310 J	600 J	1000	4000 U	720 J	800	13000 U
Chrysene	1100	830 J	300 J	350 J	600 J	1200	4000 U	860 J	830	13000 U
Benzo(b)fluoranthene	950 J	720 J	240 J	1800 U	500 J	970	4000 U	700 J	710	13000 U
Benzo(k)fluoranthene	850 J	540 J	1400 U	1800 U	510 J	810	4000 U	570 J	690	13000 U
Benzo(a)pyrene	1100	850 J	310 J	390 J	670 J	1100	4000 U	880 J	910	13000 U
Indeno(1,2,3-cd)pyrene	760 J	500 J	1400 U	1800 U	410 J	760	4000 U	620 J	640	13000 U
Dibenz(a,h)anthracene	250 J	1100 U	1400 U	1800 U	1800 U	220 J	4000 U	1400 U	210 J	13000 U
Benzo(ghi)perylene	850 J	650 J	1400 U	1800 U	630 J	980	4000 U	800 J	710	13000 U
Metals (mg/kg)										
Silver	3.7	3.6	4.2	3.9	4.3	1.1	9.2	1.9	0.99	4.7
Arsenic	13.0	11.6	14.0	13.5	14.8	8.2	22.0	10.6	7.4	15.5 B
Beryllium	0.77	0.63	0.85	0.80	0.86	0.41	1.5	0.56	0.35	1.3 B
Cadmium	3.0	2.8	3.2	3.1	3.6	1.2	6.4	1.8	1.0	5.3
Chromium	148 MBB	135 MBB	160 MBB	157 MBB	168 MBB	49.4 MBB	340 MBB	79.2 MBB	41.1 MBB	193 MBB
Copper	143 MBB	133 MBB	156 MBB	154 MBB	164 MBB	47.0 MBB	339 MBB	74.8 MBB	39.1 MBB	217 MBB
Nickel	33.6	31.4	37.4	35.9	39.5	25.9	53.2	31.0	23.3	38.4
Lead	153	142	170	164	180	68.1	340	96.9	55.5	224
Antimony	0.044 B	0.049 B	0.041 B	0.073 B	0.068 B	0.081 B	1.2 U	0.081 B	0.042 B	4.0 U
Selenium	2.6	2.4	2.9	3.2	3.4	1.0	5.8 B	1.8 B	0.78	4.3 B
Thallium	0.25 B	0.21 B	0.27 B	0.24 B	0.25 B	0.20	0.30 B	0.25 B	0.19	4.0 U
Zinc	274	249	288	288	309	123	557	178	110	432
Mercury	3.2	3.0	3.8	3.6	3.7	1.5	8.0	2.5	1.2	7.2

Table C-2

Testing Phase Analytical Results

Control Variable	Hydrogen Peroxide Addition Rate		Sodium Percarbonate Addition at Cav/Ox Unit		Recycle Duration at Cav/Ox Unit				100% Run
Degree of Variance	50% (1.2 gph)		5 kg Sodium Percarbonate		Initial Conditions	50% (30 min)	100% (60 min)	200% (120 min)	Sludge for Batch 33
Batch Number	Batch 27		Batch 28		Batch 29				Batch 31
Sample ID	CCO-27-01-01	OXO-27-01-01	CCO-28-01-01	OXO-28-01-01	CCO-29-01-01	OXO-29-01-01	OXO-29-02-01	OXO-29-03-01	PSD-31-01-01
Percent Moisture (%)	76.6	80.3	80.6	80.9	80.4	80.5	77.1	79.5	28.6
TRPH (mg/kg)	732	1460	1590	1180	1580	1800	1700	1840	254
PAHs (ug/kg)									
Acenaphthylene	1400 U	1700 U	1700 U	1700 U	1700 U	1700 U	1400 U	1600 U	210 J
Naphthalene	1400 U	1700 U	1700 U	1700 U	1700 U	1700 U	1400 U	1600 U	460 U
Acenaphthene	1400 U	1700 U	1700 U	1700 U	1700 U	1700 U	1400 U	1600 U	98 J
Fluorene	1400 U	1700 U	1700 U	1700 U	1700 U	1700 U	1400 U	1600 U	460 U
Phenanthrene	400 J	650 J	450 J	600 J	420 J	370 J	510 J	480 J	570
Anthracene	280 J	440 J	1700 U	390 J	1700	1700 U	340 J	410 J	360 J
Fluoranthene	1200 J	1900	1200 J	1700	1300 J	1400 J	1900	1700	1900
Pyrene	1100 J	1600 J	1200 J	1500 J	1200 J	1200 J	1500	1300 J	1400
Benzo(a)anthracene	610 J	910 J	700 J	820 J	660 J	630 J	910 J	800 J	1100
Chrysene	680 J	1000 J	770 J	930 J	750 J	760 J	1000 J	870 J	1200
Benzo(b)fluoranthene	570 J	660 J	620 J	760 J	750 J	580 J	790 J	610 J	940
Benzo(k)fluoranthene	540 J	1000 J	680 J	780 J	570 J	550 J	770 J	830 J	1000
Benzo(a)pyrene	640 J	1000 J	740 J	880 J	780 J	710 J	1000 J	840 J	1300
Indeno(1,2,3-cd)pyrene	350 J	480 J	1700 U	480 J	400 J	1700	560 J	450 J	670
Dibenz(a,h)anthracene	1400 U	1700	1700 U	1700	1700	1700	1400 U	1600 U	460 U
Benzo(ghi)perylene	390 J	580 J	370 J	520 J	430 J	420 J	680 J	580 J	750
Metals (mg/kg)									
Silver	3.5	3.6	3.4	3.6	3.3	4.7	3.6	4.3	0.44
Arsenic	12.3	12.3	11.6	12.7	11.4	16.7	13.1	14.5	3.3
Beryllium	0.82	0.73	0.72	0.80	0.62	0.99	0.82	0.81	0.17
Cadmium	2.7	2.9	2.7	4.8	2.6	3.7	2.9	3.1	0.47
Chromium	137	141	130	139	126	185	145	162	19.7
Copper	136 MBB	138 MBB	128 MBB	138 MBB	125 MBB	180 MBB	141 MBB	159 MBB	18.9
Nickel	32.9	34	30.9	33.4	30.1	43.6	34.7	38.2	10
Lead	144	149	139	150	137	195	158	177	27.7
Antimony	0.15 B	0.51 U	0.52 U	0.52 U	0.51 U	0.51 U	0.44 U	0.49 U	0.014 B
Selenium	1.6 B	1.9 B	1.6 B	1.7 B	1.4 B	2.0 B	1.5 B	1.8 B	0.41 B
Thallium	0.24 B	0.26 B	0.21 B	0.23 B	0.21 B	0.33 B	0.25 B	0.28 B	0.083 B
Zinc	271	274	258	275	249	353	279	307	57.9
Mercury	4.5	4.5	4.5	5.1	4.5	5.5	4.3	4.5	1.3

Table C-2

Testing Phase Analytical Results

Control Variable	Process Chemicals						
Degree of Variance	No Process Chemicals Added at Any Stage						
Batch Number	Batch 32						
Sample ID	PPI-32-01-01	PPO-32-01-01	AER-32-01-01	CCO-32-01-01	OXO-32-01-01	PSD-32-01-01	PAQ-32-01-01
Percent Moisture (%)	64.9	69.3	75.6	79.9	80.3	26.8	91.8
TRPH (mg/kg)	1640	1910	856	918	986	356	1300
PAHs (ug/kg)							
Acenaphthylene	940 U	1100 U	1400 U	1600 U	1700 U	190 J	4000 U
Naphthalene	940 U	1100 U	1400 U	1600 U	1700 U	450 U	4000 U
Acenaphthene	940 U	1100 U	1400 U	1600 U	1700 U	120 J	4000 U
Fluorene	940 U	1100 U	1400 U	1600 U	1700 U	130 J	4000 U
Phenanthrene	600 J	520 J	460 J	350 J	360 J	640	4000 U
Anthracene	390 J	360 J	300 J	1600 U	1700 U	420 J	4000 U
Fluoranthene	1700	1600	1200 J	860 J	1000 J	2000	1300 J
Pyrene	1400	1200	1000 J	840 J	910 J	1600	1000 J
Benzo(a)anthracene	850 J	790 J	610 J	470 J	530 J	1200	4000 U
Chrysene	940	890 J	700 J	510 J	600 J	1300	4000 U
Benzo(b)fluoranthene	770 J	870 J	560 J	440 J	530 J	1000	4000 U
Benzo(k)fluoranthene	710 J	570 J	550 J	1600 U	460 J	1100	4000 U
Benzo(a)pyrene	940	870 J	710 J	520 J	570 J	1400	4000 U
Indeno(1,2,3-cd)pyrene	470 J	420 J	360 J	1600 U	1700 U	710	4000 U
Dibenz(a,h)anthracene	940 U	1100 U	1400 U	1600 U	1700 U	450 U	4000 U
Benzo(ghi)perylene	550 J	490 J	410 J	310 J	350 J	790	4000 U
Metals (mg/kg)							
Silver	3.5	3.5	3.5	3.6	3.6	0.85	9.0
Arsenic	12.6	12.7	12.5	12.5	13.0	6.7	23.7
Beryllium	0.72	0.76	0.78	0.73	0.72	0.32	1.7
Cadmium	2.9	2.8	2.9	2.9	3.0	0.94	6.7
Chromium	144	141	141	142	145	38.0	348
Copper	143	142	138	142	145	37.8	354
Nickel	34.0	32.4	32.5	33.6	34.3	19.9	57.3
Lead	159	149	150	149	153	50.9	346
Antimony	0.082 B	0.33 U	0.41 U	0.50 U	0.51 U	0.0059 B	1.2 U
Selenium	1.6	1.7	1.6 B	1.5 B	2.0 B	0.60 B	3.7 B
Thallium	0.24 B	0.25 B	0.24 B	0.24 B	0.24 B	0.16	0.39 B
Zinc	275	269	270	269	277	102	598
Mercury	4.6	4.8	4.2	4.6	4.4	1.7	10.3

Table C-2

Testing Phase Analytical Results

Control Variable	Retreatment of Sludge from 100% Run (Batch 31)							Pre-Processor	
Degree of Variance	Sludge Rewatered and Sent Through Entire Process							Two Preprocessors Added In Series	
Batch Number	Batch 33							Batch 38	
Sample ID	PPI-33-01-01	PPO-33-01-01	AER-33-01-01	CCO-33-01-01	OXO-33-01-01	PSD-33-01-01	PAQ-33-01-01	PPI-38-01-01	PPO-38-01-01
Percent Moisture (%)	37.5	48.1	53.6	69.7	64.8	26.8	97.1	67.9	74.3
TRPH (mg/kg)	379	475	363	821	754	53.3	787	1330	1100
PAHs (ug/kg)									
Acenaphthylene	120 J	250 J	1400	1100 U	940 U	120 J	12000 U	320 J	1300 U
Naphthalene	530 U	640 U	610 J	1100 U	940 U	230 J	12000 U	1000 U	1300 U
Acenaphthene	530 U	140 J	390 J	1100 U	940 U	100 J	12000 U	230 J	1300 U
Fluorene	120 J	130 J	380 J	1100 U	940 U	120 J	12000 U	230 J	1300 U
Phenanthrene	470 J	770	2100	300 J	570 J	680	12000 U	910 J	700 J
Anthracene	290 J	580 J	1700	1100 U	320 J	410 J	12000 U	650 J	510 J
Fluoranthene	1400	2600	7700	890 J	1700	1900	12000 U	3100	2300
Pyrene	1300	2000	6100	790 J	1200	1600	12000 U	2300	1700
Benzo(a)anthracene	810	1600	5500	480 J	780 J	1100	12000 U	1400	980 J
Chrysene	900	1700	5800	510 J	880 J	1200	12000 U	1400	1100 J
Benzo(b)fluoranthene	680	1400	4500	470 J	740 J	1000	12000 U	1300	900 J
Benzo(k)fluoranthene	810	1500	5100	390 J	710 J	960	12000 U	1200	910 J
Benzo(a)pyrene	900	1800	6600	520 J	870 J	1200	12000 U	1600	1000 J
Indeno(1,2,3-cd)pyrene	490 J	900	3100	260 J	450 J	620	12000 U	770 J	530 J
Dibenz(a,h)anthracene	530 U	640 U	710 U	1100 U	940 U	450 U	12000 U	1000 U	1300 U
Benzo(ghi)perylene	560	1000	3600	260 J	530 J	680	12000 U	930 J	620 J
Metals (mg/kg)									
Silver	0.63	0.54	0.73	1.3	0.78	0.28	2.9 B	3.3	3.6
Arsenic	4.0	4.0	4.3	6.0	4.7	2.1	8.3 B	13.4	14.2
Beryllium	0.19	0.18 B	0.18 B	0.31 B	0.23 B	0.12 B	3.5 U	0.76	0.82
Cadmium	0.66	0.55	0.69	1.1	0.79	0.33	2.4 B	2.9	3.2
Chromium	28.1	22.7	30.5	53.7	35.4	14.9	113	144	153
Copper	27.9	22.8	29.7	52.7	33.9	11.8	119	139 MBB	148 MBB
Nickel	11.7	10.4	12.5	17.8	13.7	6.7	24.7	32.9	35.6
Lead	36.0	29.7	39.9	61.0	42.6	18.7	118	146	155
Antimony	0.16 U	0.19 U	0.22 U	0.33 U	0.28 U	0.14 U	3.5 U	0.20 B	0.099 B
Selenium	0.38 B	0.37 B	0.38 B	0.69 B	0.42 B	0.20 B	1.6 B	2.0	1.8 B
Thallium	0.10 B	0.083 B	0.11 B	0.13 B	0.11 B	0.057 B	0.083 B	0.23 B	0.25 B
Zinc	69.2	57.3	73.0	112	80.5	38.2	217	282	302
Mercury	1.1	0.95	1.3	1.3	1.2	0.35	9.5	4.4	4.7

Table C-3

Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
BG-1	SW846 6020, Metals	NA	D9B270120	D9B270120 003
BG-1	SW846 7471A, Mercury	NA	D9B270120	D9B270120 003
BG-1	MCAWW 160.3 MOD, % Moisture	NA	D9B270120	D9B270120 003
BG-1	SW846 8270C, PAHs	NA	D9B270120	D9B270120 003
BG-1	MCAWW 418.1, TRPH	NA	D9B270120	D9B270120 003
BG-2	SW846 6020, Metals	NA	D9B270120	D9B270120 004
BG-2	SW846 7471A, Mercury	NA	D9B270120	D9B270120 004
BG-2	MCAWW 160.3 MOD, % Moisture	NA	D9B270120	D9B270120 004
BG-2	SW846 8270C, PAHs	NA	D9B270120	D9B270120 004
BG-2	MCAWW 418.1, TRPH	NA	D9B270120	D9B270120 004
BG-3	SW846 6020, Metals	NA	D9B270120	D9B270120 005
BG-3	SW846 7471A, Mercury	NA	D9B270120	D9B270120 005
BG-3	MCAWW 160.3 MOD, % Moisture	NA	D9B270120	D9B270120 005
BG-3	SW846 8270C, PAHs	NA	D9B270120	D9B270120 005
BG-3	MCAWW 418.1, TRPH	NA	D9B270120	D9B270120 005
TANK 1	SW846 6020, Metals	NA	D9VB110203	D9VB110203 008
TANK 1	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 008
TANK 1	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 008
TANK 1	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 008
TANK 1	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 008
TANK 2	SW846 6020, Metals	NA	D9VB110203	D9VB110203 009
TANK 2	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 009
TANK 2	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 009
TANK 2	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 009
TANK 2	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 009
TANK 3	SW846 6020, Metals	NA	D9VB110203	D9VB110203 010
TANK 3	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 010
TANK 3	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 010
TANK 3	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 010
TANK 3	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 010
TANK 4	SW846 6020, Metals	NA	D9VB110203	D9VB110203 011
TANK 4	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 011
TANK 4	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 011
TANK 4	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 011
TANK 4	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 011
TANK 5	SW846 6020, Metals	NA	D9VB110203	D9VB110203 012
TANK 5	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 012
TANK 5	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 012
TANK 5	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 012
TANK 5	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 012
TANK 6	SW846 6020, Metals	NA	D9VB110203	D9VB110203 013
TANK 6	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 013
TANK 6	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 013
TANK 6	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 013
TANK 6	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 013
TANK 7	SW846 6020, Metals	NA	D9VB110203	D9VB110203 007
TANK 7	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 008
TANK 7	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 008
TANK 7	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 008
TANK 7	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 008
PPI-01-01-01	SW846 6020, Metals	NA	D9VB110203	D9VB110203 001
PPI-01-01-01	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 001
PPI-01-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 001
PPI-01-01-01	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 001
PPI-01-01-01	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 001
PPO-01-01-01	SW846 6020, Metals	NA	D9VB110203	D9VB110203 002
PPO-01-01-01	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 002
PPO-01-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 002
PPO-01-01-01	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 002
PPO-01-01-01	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 002
AER-01-01-01	SW846 6020, Metals	NA	D9VB110203	D9VB110203 003
AER-01-01-01	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 003
AER-01-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 003
AER-01-01-01	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 003
AER-01-01-01	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 003

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Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
CCO-01-01-01	SW846 6020, Metals	NA	D9VB110203	D9VB110203 004
CCO-01-01-01	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 004
CCO-01-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 004
CCO-01-01-01	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 004
CCO-01-01-01	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 004
OXO-01-01-01	SW846 6020, Metals	NA	D9VB110203	D9VB110203 005
OXO-01-01-01	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 005
OXO-01-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 005
OXO-01-01-01	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 005
OXO-01-01-01	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 005
PSD-01-01-01	SW846 6020, Metals	NA	D9VB110203	D9VB110203 006
PSD-01-01-01	SW846 7471A, Mercury	NA	D9VB110203	D9VB110203 006
PSD-01-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9VB110203	D9VB110203 006
PSD-01-01-01	SW846 8270C, PAHs	NA	D9VB110203	D9VB110203 006
PSD-01-01-01	MCAWW 418.1, TRPH	NA	D9VB110203	D9VB110203 006
PPI-02-01-01	SW846 6020, Metals	NA	D9B130115	D9B130115 001
PPI-02-01-01	SW846 7471A, Mercury	NA	D9B130115	D9B130115 001
PPI-02-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B130115	D9B130115 001
PPI-02-01-01	SW846 8270C, PAHs	NA	D9B130115	D9B130115 001
PPI-02-01-01	MCAWW 418.1, TRPH	NA	D9B130115	D9B130115 001
PPO-02-01-01	SW846 6020, Metals	NA	D9B130115	D9B130115 002
PPO-02-01-01	SW846 7471A, Mercury	NA	D9B130115	D9B130115 002
PPO-02-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B130115	D9B130115 002
PPO-02-01-01	SW846 8270C, PAHs	NA	D9B130115	D9B130115 002
PPO-02-01-01	MCAWW 418.1, TRPH	NA	D9B130115	D9B130115 002
PPI-02-02-01	SW846 6020, Metals	NA	D9B130115	D9B130115 003
PPI-02-02-01	SW846 7471A, Mercury	NA	D9B130115	D9B130115 003
PPI-02-02-01	MCAWW 160.3 MOD, % Moisture	NA	D9B130115	D9B130115 003
PPI-02-02-01	SW846 8270C, PAHs	NA	D9B130115	D9B130115 003
PPI-02-02-01	MCAWW 418.1, TRPH	NA	D9B130115	D9B130115 003
PPO-02-02-01	SW846 6020, Metals	NA	D9B130115	D9B130115 004
PPO-02-02-01	SW846 7471A, Mercury	NA	D9B130115	D9B130115 004
PPO-02-02-01	MCAWW 160.3 MOD, % Moisture	NA	D9B130115	D9B130115 004
PPO-02-02-01	SW846 8270C, PAHs	NA	D9B130115	D9B130115 004
PPO-02-02-01	MCAWW 418.1, TRPH	NA	D9B130115	D9B130115 004
PPI-03-01-01	SW846 6020, Metals	NA	D9B160129	D9B160129 001
PPI-03-01-01	SW846 7471A, Mercury	NA	D9B160129	D9B160129 001
PPI-03-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B160129	D9B160129 001
PPI-03-01-01	SW846 8270C, PAHs	NA	D9B160129	D9B160129 001
PPI-03-01-01	MCAWW 418.1, TRPH	NA	D9B160129	D9B160129 001
PPO-03-01-01	SW846 6020, Metals	NA	D9B160129	D9B160129 002
PPO-03-01-01	SW846 7471A, Mercury	NA	D9B160129	D9B160129 002
PPO-03-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B160129	D9B160129 002
PPO-03-01-01	SW846 8270C, PAHs	NA	D9B160129	D9B160129 002
PPO-03-01-01	MCAWW 418.1, TRPH	NA	D9B160129	D9B160129 002
PPI-04-01-01	SW846 6020, Metals	NA	D9B160129	D9B160129 003
PPI-04-01-01	SW846 7471A, Mercury	NA	D9B160129	D9B160129 003
PPI-04-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B160129	D9B160129 003
PPI-04-01-01	SW846 8270C, PAHs	NA	D9B160129	D9B160129 003
PPI-04-01-01	MCAWW 418.1, TRPH	NA	D9B160129	D9B160129 003
PPO-04-01-01	SW846 6020, Metals	NA	D9B160129	D9B160129 004
PPO-04-01-01	SW846 7471A, Mercury	NA	D9B160129	D9B160129 004
PPO-04-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B160129	D9B160129 004
PPO-04-01-01	SW846 8270C, PAHs	NA	D9B160129	D9B160129 004
PPO-04-01-01	MCAWW 418.1, TRPH	NA	D9B160129	D9B160129 004
AER-05-01-01	SW846 6020, Metals	NA	D9B160129	D9B160129 005
AER-05-01-01	SW846 7471A, Mercury	NA	D9B160129	D9B160129 005
AER-05-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B160129	D9B160129 005
AER-05-01-01	SW846 8270C, PAHs	NA	D9B160129	D9B160129 005
AER-05-01-01	MCAWW 418.1, TRPH	NA	D9B160129	D9B160129 005
CCO-05-01-01	SW846 6020, Metals	NA	D9B160129	D9B160129 006
CCO-05-01-01	SW846 7471A, Mercury	NA	D9B160129	D9B160129 006
CCO-05-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B160129	D9B160129 006
CCO-05-01-01	SW846 8270C, PAHs	NA	D9B160129	D9B160129 006

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Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
CCO-05-01-01	MCAWW 418.1, TRPH	NA	D9B160129	D9B160129 006
CCO-05-02-01	SW846 6020, Metals	NA	D9B160129	D9B160129 007
CCO-05-02-01	SW846 7471A, Mercury	NA	D9B160129	D9B160129 007
CCO-05-02-01	MCAWW 160.3 MOD, % Moisture	NA	D9B160129	D9B160129 007
CCO-05-02-01	SW846 8270C, PAHs	NA	D9B160129	D9B160129 007
CCO-05-02-01	MCAWW 418.1, TRPH	NA	D9B160129	D9B160129 007
CCO-05-03-01	SW846 6020, Metals	NA	D9B160129	D9B160129 008
CCO-05-03-01	SW846 7471A, Mercury	NA	D9B160129	D9B160129 008
CCO-05-03-01	MCAWW 160.3 MOD, % Moisture	NA	D9B160129	D9B160129 008
CCO-05-03-01	SW846 8270C, PAHs	NA	D9B160129	D9B160129 008
CCO-05-03-01	MCAWW 418.1, TRPH	NA	D9B160129	D9B160129 008
CCO-06-01-01	SW846 6020, Metals	NA	D9B170116	D9B170116 001
CCO-06-01-01	SW846 7471A, Mercury	NA	D9B170116	D9B170116 001
CCO-06-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B170116	D9B170116 001
CCO-06-01-01	SW846 8270C, PAHs	NA	D9B170116	D9B170116 001
CCO-06-01-01	MCAWW 418.1, TRPH	NA	D9B170116	D9B170116 001
OXO-06-01-01	SW846 6020, Metals	NA	D9B170116	D9B170116 002
OXO-06-01-01	SW846 7471A, Mercury	NA	D9B170116	D9B170116 002
OXO-06-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B170116	D9B170116 002
OXO-06-01-01	SW846 8270C, PAHs	NA	D9B170116	D9B170116 002
OXO-06-01-01	MCAWW 418.1, TRPH	NA	D9B170116	D9B170116 002
AER-07-01-01	SW846 6020, Metals	NA	D9B170116	D9B170116 003
AER-07-01-01	SW846 7471A, Mercury	NA	D9B170116	D9B170116 003
AER-07-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B170116	D9B170116 003
AER-07-01-01	SW846 8270C, PAHs	NA	D9B170116	D9B170116 003
AER-07-01-01	MCAWW 418.1, TRPH	NA	D9B170116	D9B170116 003
CCO-07-01-01	SW846 6020, Metals	NA	D9B170116	D9B170116 004
CCO-07-01-01	SW846 7471A, Mercury	NA	D9B170116	D9B170116 004
CCO-07-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B170116	D9B170116 004
CCO-07-01-01	SW846 8270C, PAHs	NA	D9B170116	D9B170116 004
CCO-07-01-01	MCAWW 418.1, TRPH	NA	D9B170116	D9B170116 004
AER-08-01-01	SW846 6020, Metals	NA	D9B180140	D9B180140 001
AER-08-01-01	SW846 7471A, Mercury	NA	D9B180140	D9B180140 001
AER-08-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B180140	D9B180140 001
AER-08-01-01	SW846 8270C, PAHs	NA	D9B180140	D9B180140 001
AER-08-01-01	MCAWW 418.1, TRPH	NA	D9B180140	D9B180140 001
CCO-08-01-01	SW846 6020, Metals	NA	D9B180140	D9B180140 002
CCO-08-01-01	SW846 7471A, Mercury	NA	D9B180140	D9B180140 002
CCO-08-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B180140	D9B180140 002
CCO-08-01-01	SW846 8270C, PAHs	NA	D9B180140	D9B180140 002
CCO-08-01-01	MCAWW 418.1, TRPH	NA	D9B180140	D9B180140 002
CCO-08-02-01	SW846 6020, Metals	NA	D9B180140	D9B180140 003
CCO-08-02-01	SW846 7471A, Mercury	NA	D9B180140	D9B180140 003
CCO-08-02-01	MCAWW 160.3 MOD, % Moisture	NA	D9B180140	D9B180140 003
CCO-08-02-01	SW846 8270C, PAHs	NA	D9B180140	D9B180140 003
CCO-08-02-01	MCAWW 418.1, TRPH	NA	D9B180140	D9B180140 003
AER-09-01-01	SW846 6020, Metals	NA	D9B180140	D9B180140 004
AER-09-01-01	SW846 7471A, Mercury	NA	D9B180140	D9B180140 004
AER-09-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B180140	D9B180140 004
AER-09-01-01	SW846 8270C, PAHs	NA	D9B180140	D9B180140 004
AER-09-01-01	MCAWW 418.1, TRPH	NA	D9B180140	D9B180140 004
CCO-09-01-01	SW846 6020, Metals	NA	D9B180140	D9B180140 005
CCO-09-01-01	SW846 7471A, Mercury	NA	D9B180140	D9B180140 005
CCO-09-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B180140	D9B180140 005
CCO-09-01-01	SW846 8270C, PAHs	NA	D9B180140	D9B180140 005
CCO-09-01-01	MCAWW 418.1, TRPH	NA	D9B180140	D9B180140 005
OXO-10-01-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 002
OXO-10-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 002
OXO-10-01-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 002
OXO-10-01-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 002
OXO-10-01-01	SW846 6020, Metals	NA	D9B190129	D9B190129 002
HYO-10-01-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 005
HYO-10-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 005
HYO-10-01-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 005

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Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
HYO-10-01-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 005
HYU-10-01-01	SW846 6020, Metals	NA	D9B190129	D9B190129 004
HYU-10-01-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 004
HYU-10-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 004
HYU-10-01-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 004
HYU-10-01-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 004
PAQ-10-01-01	SW846 6020, Metals	NA	D9B200124	D9B200124 010
PAQ-10-01-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 010
PAQ-10-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 010
PAQ-10-01-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 010
PAQ-10-01-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 010
HYO-10-02-01	SW846 6020, Metals	NA	D9B190129	D9B190129 006
HYO-10-02-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 006
HYO-10-02-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 006
HYO-10-02-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 006
HYO-10-02-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 006
HYU-10-02-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 007
HYU-10-02-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 007
HYU-10-02-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 007
HYU-10-02-01	SW846 6020, Metals	NA	D9B190129	D9B190129 007
HYU-10-02-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 007
HYO-10-03-01	SW846 6020, Metals	NA	D9B190129	D9B190129 009
HYO-10-03-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 009
HYO-10-03-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 009
HYO-10-03-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 009
HYO-10-03-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 009
HYU-10-03-01	SW846 6020, Metals	NA	D9B190129	D9B190129 008
HYU-10-03-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 008
HYU-10-03-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 008
HYU-10-03-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 008
HYU-10-03-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 008
PAQ-10-04-01	SW846 6020, Metals	NA	D9B190129	D9B190129 010
PAQ-10-04-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 010
PAQ-10-04-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 010
PAQ-10-04-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 010
PAQ-10-04-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 010
PSD-10-04-01	SW846 6020, Metals	NA	D9B190129	D9B190129 011
PSD-10-04-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 011
PSD-10-04-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 011
PSD-10-04-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 011
PSD-10-04-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 011
PAQ-10-05-01	SW846 6020, Metals	NA	D9B190129	D9B190129 012
PAQ-10-05-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 012
PAQ-10-05-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 012
PAQ-10-05-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 012
PAQ-10-05-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 012
PAQ-10-06-01	SW846 6020, Metals	NA	D9B200124	D9B200124 002
PAQ-10-06-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 002
PAQ-10-06-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 002
PAQ-10-06-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 002
PAQ-10-06-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 002
PAQ-10-07-01	SW846 6020, Metals	NA	D9B200124	D9B200124 003
PAQ-10-07-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 003
PAQ-10-07-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 003
PAQ-10-07-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 003
PAQ-10-07-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 003
PAQ-10-08-01	SW846 6020, Metals	NA	D9B200124	D9B200124 007
PAQ-10-08-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 007
PAQ-10-08-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 007
PAQ-10-08-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 007
PAQ-10-08-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 007
PAQ-10-09-01	SW846 6020, Metals	NA	D9B200124	D9B200124 009
PAQ-10-09-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 009
PAQ-10-09-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 009

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Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
PAQ-10-09-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 009
PAQ-10-09-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 009
PSD-10-05-01	SW846 6020, Metals	NA	D9B190129	D9B190129 013
PSD-10-05-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 013
PSD-10-05-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 013
PSD-10-05-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 013
PSD-10-05-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 013
PSD-10-06-01	SW846 6020, Metals	NA	D9B200124	D9B200124 001
PSD-10-06-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 001
PSD-10-06-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 001
PSD-10-06-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 001
PSD-10-06-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 001
PSD-10-07-01	SW846 6020, Metals	NA	D9B200124	D9B200124 004
PSD-10-07-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 004
PSD-10-07-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 004
PSD-10-07-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 004
PSD-10-07-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 004
PSD-10-08-01	SW846 6020, Metals	NA	D9B200124	D9B200124 005
PSD-10-08-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 005
PSD-10-08-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 005
PSD-10-08-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 005
PSD-10-08-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 005
PSD-10-08-02	SW846 6020, Metals	NA	D9B200124	D9B200124 006
PSD-10-08-02	SW846 7471A, Mercury	NA	D9B200124	D9B200124 006
PSD-10-08-02	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 006
PSD-10-08-02	SW846 8270C, PAHs	NA	D9B200124	D9B200124 006
PSD-10-08-02	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 006
PSD-10-09-01	SW846 6020, Metals	NA	D9B200124	D9B200124 008
PSD-10-09-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 008
PSD-10-09-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 008
PSD-10-09-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 008
PSD-10-09-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 008
PSD-10-10-01	SW846 6020, Metals	NA	D9B200124	D9B200124 011
PSD-10-10-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 011
PSD-10-10-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 011
PSD-10-10-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 011
PSD-10-10-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 011
CCO-11-01-01	SW846 6020, Metals	NA	D9B190129	D9B190129 001
CCO-11-01-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 001
CCO-11-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 001
CCO-11-01-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 001
CCO-11-01-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 001
OXO-11-01-01	SW846 6020, Metals	NA	D9B190129	D9B190129 003
OXO-11-01-01	SW846 7471A, Mercury	NA	D9B190129	D9B190129 003
OXO-11-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B190129	D9B190129 003
OXO-11-01-01	SW846 8270C, PAHs	NA	D9B190129	D9B190129 003
OXO-11-01-01	MCAWW 418.1, TRPH	NA	D9B190129	D9B190129 003
CCO-12-01-01	SW846 6020, Metals	NA	D9B200124	D9B200124 012
CCO-12-01-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 012
CCO-12-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 012
CCO-12-01-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 012
CCO-12-01-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 012
OXO-12-01-01	SW846 6020, Metals	NA	D9B200124	D9B200124 013
OXO-12-01-01	SW846 7471A, Mercury	NA	D9B200124	D9B200124 013
OXO-12-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B200124	D9B200124 013
OXO-12-01-01	SW846 8270C, PAHs	NA	D9B200124	D9B200124 013
OXO-12-01-01	MCAWW 418.1, TRPH	NA	D9B200124	D9B200124 013
CCO-13-01-01	SW846 6020, Metals	NA	D9B240123	D9B240123 001
CCO-13-01-01	SW846 7471A, Mercury	NA	D9B240123	D9B240123 001
CCO-13-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B240123	D9B240123 001
CCO-13-01-01	SW846 8270C, PAHs	NA	D9B240123	D9B240123 001
CCO-13-01-01	MCAWW 418.1, TRPH	NA	D9B240123	D9B240123 001
OXO-13-01-01	SW846 6020, Metals	NA	D9B240123	D9B240123 002
OXO-13-01-01	SW846 7471A, Mercury	NA	D9B240123	D9B240123 002

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Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
OXO-13-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B240123	D9B240123 002
OXO-13-01-01	SW846 8270C, PAHs	NA	D9B240123	D9B240123 002
OXO-13-01-01	MCAWW 418.1, TRPH	NA	D9B240123	D9B240123 002
CCO-14-01-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 001
CCO-14-01-01	SW846 7471A, Mercury	NA	C9B250121	C9B250121 001
CCO-14-01-01	SW846 8310, PAHs	NA	C9B250121	C9B250121 001
CCO-14-01-01	MCAWW 418.1, TRPH	NA	C9B250121	C9B250121 001
CCO-14-01-01	MCAWW 160.3 MOD, % Moisture	NA	C9B250121	C9B250121 001
CCO-14-01-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 001
OXO-14-01-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 002
OXO-14-01-01	SW846 7471A, Mercury	NA	C9B250121	C9B250121 002
OXO-14-01-01	SW846 8310, PAHs	NA	C9B250121	C9B250121 002
OXO-14-01-01	MCAWW 418.1, TRPH	NA	C9B250121	C9B250121 002
OXO-14-01-01	MCAWW 160.3 MOD, % Moisture	NA	C9B250121	C9B250121 002
OXO-14-01-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 002
CCO-15-01-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 003
CCO-15-01-01	SW846 7471A, Mercury	NA	C9B250121	C9B250121 003
CCO-15-01-01	SW846 8310, PAHs	NA	C9B250121	C9B250121 003
CCO-15-01-01	MCAWW 418.1, TRPH	NA	C9B250121	C9B250121 003
CCO-15-01-01	MCAWW 160.3 MOD, % Moisture	NA	C9B250121	C9B250121 003
CCO-15-01-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 003
OXO-15-01-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 004
OXO-15-01-01	SW846 7471A, Mercury	NA	C9B250121	C9B250121 004
OXO-15-01-01	SW846 8310, PAHs	NA	C9B250121	C9B250121 004
OXO-15-01-01	MCAWW 418.1, TRPH	NA	C9B250121	C9B250121 004
OXO-15-01-01	MCAWW 160.3 MOD, % Moisture	NA	C9B250121	C9B250121 004
OXO-15-01-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 004
OXO-15-02-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 005
OXO-15-02-01	SW846 7471A, Mercury	NA	C9B250121	C9B250121 005
OXO-15-02-01	SW846 8310, PAHs	NA	C9B250121	C9B250121 005
OXO-15-02-01	MCAWW 418.1, TRPH	NA	C9B250121	C9B250121 005
OXO-15-02-01	MCAWW 160.3 MOD, % Moisture	NA	C9B250121	C9B250121 005
OXO-15-02-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 005
OXO-15-03-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 006
OXO-15-03-01	SW846 7471A, Mercury	NA	C9B250121	C9B250121 006
OXO-15-03-01	SW846 8310, PAHs	NA	C9B250121	C9B250121 006
OXO-15-03-01	MCAWW 418.1, TRPH	NA	C9B250121	C9B250121 006
OXO-15-03-01	MCAWW 160.3 MOD, % Moisture	NA	C9B250121	C9B250121 006
OXO-15-03-01	SW846 6010B, Metals	NA	C9B250121	C9B250121 006
PPI-16-01-01	SW846 6020, Metals	NA	D9B270120	D9B270120 001
PPI-16-01-01	SW846 7471A, Mercury	NA	D9B270120	D9B270120 001
PPI-16-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B270120	D9B270120 001
PPI-16-01-01	SW846 8270C, PAHs	NA	D9B270120	D9B270120 001
PPI-16-01-01	MCAWW 418.1, TRPH	NA	D9B270120	D9B270120 001
PPO-16-01-01	SW846 6020, Metals	NA	D9B270120	D9B270120 002
PPO-16-01-01	SW846 7471A, Mercury	NA	D9B270120	D9B270120 002
PPO-16-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9B270120	D9B270120 002
PPO-16-01-01	SW846 8270C, PAHs	NA	D9B270120	D9B270120 002
PPO-16-01-01	MCAWW 418.1, TRPH	NA	D9B270120	D9B270120 002
PPI-17-01-01	SW846 6020, Metals	NA	D9C020115	D9C020115 001
PPI-17-01-01	SW846 7471A, Mercury	NA	D9C020115	D9C020115 001
PPI-17-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020115	D9C020115 001
PPI-17-01-01	SW846 8270C, PAHs	NA	D9C020115	D9C020115 001
PPI-17-01-01	MCAWW 418.1, TRPH	NA	D9C020115	D9C020115 001
PPO-17-01-01	SW846 6020, Metals	NA	D9C020115	D9C020115 002
PPO-17-01-01	SW846 7471A, Mercury	NA	D9C020115	D9C020115 002
PPO-17-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020115	D9C020115 002
PPO-17-01-01	SW846 8270C, PAHs	NA	D9C020115	D9C020115 002
PPO-17-01-01	MCAWW 418.1, TRPH	NA	D9C020115	D9C020115 002
AER-17-01-01	SW846 6020, Metals	NA	D9C020115	D9C020115 003
AER-17-01-01	SW846 7471A, Mercury	NA	D9C020115	D9C020115 003
AER-17-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020115	D9C020115 003
AER-17-01-01	SW846 8270C, PAHs	NA	D9C020115	D9C020115 003
AER-17-01-01	MCAWW 418.1, TRPH	NA	D9C020115	D9C020115 003

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Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
CCO-17-01-01	SW846 6020, Metals	NA	D9C020115	D9C020115 004
CCO-17-01-01	SW846 7471A, Mercury	NA	D9C020115	D9C020115 004
CCO-17-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020115	D9C020115 004
CCO-17-01-01	SW846 8270C, PAHs	NA	D9C020115	D9C020115 004
CCO-17-01-01	MCAWW 418.1, TRPH	NA	D9C020115	D9C020115 004
OXO-17-01-01	SW846 6020, Metals	NA	D9C020115	D9C020115 005
OXO-17-01-01	SW846 7471A, Mercury	NA	D9C020115	D9C020115 005
OXO-17-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020115	D9C020115 005
OXO-17-01-01	SW846 8270C, PAHs	NA	D9C020115	D9C020115 005
OXO-17-01-01	MCAWW 418.1, TRPH	NA	D9C020115	D9C020115 005
PAQ-17-01-01	SW846 6020, Metals	NA	D9C020137	D9C020137 002
PAQ-17-01-01	SW846 7471A, Mercury	NA	D9C020137	D9C020137 002
PAQ-17-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020137	D9C020137 002
PAQ-17-01-01	SW846 8270C, PAHs	NA	D9C020137	D9C020137 002
PAQ-17-01-01	MCAWW 418.1, TRPH	NA	D9C020137	D9C020137 002
PSD-17-01-01	SW846 6020, Metals	NA	D9C020137	D9C020137 003
PSD-17-01-01	SW846 7471A, Mercury	NA	D9C020137	D9C020137 003
PSD-17-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020137	D9C020137 003
PSD-17-01-01	SW846 8270C, PAHs	NA	D9C020137	D9C020137 003
PSD-17-01-01	MCAWW 418.1, TRPH	NA	D9C020137	D9C020137 003
PPI-18-01-01	SW846 6020, Metals	NA	D9C020115	D9C020115 006
PPI-18-01-01	SW846 7471A, Mercury	NA	D9C020115	D9C020115 006
PPI-18-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020115	D9C020115 006
PPI-18-01-01	SW846 8270C, PAHs	NA	D9C020115	D9C020115 006
PPI-18-01-01	MCAWW 418.1, TRPH	NA	D9C020115	D9C020115 006
PPO-18-01-01	SW846 6020, Metals	NA	D9C020115	D9C020115 007
PPO-18-01-01	SW846 7471A, Mercury	NA	D9C020115	D9C020115 007
PPO-18-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020115	D9C020115 007
PPO-18-01-01	SW846 8270C, PAHs	NA	D9C020115	D9C020115 007
PPO-18-01-01	MCAWW 418.1, TRPH	NA	D9C020115	D9C020115 007
AER-18-01-01	SW846 6020, Metals	NA	D9C020137	D9C020137 001
AER-18-01-01	SW846 7471A, Mercury	NA	D9C020137	D9C020137 001
AER-18-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020137	D9C020137 001
AER-18-01-01	SW846 8270C, PAHs	NA	D9C020137	D9C020137 001
AER-18-01-01	MCAWW 418.1, TRPH	NA	D9C020137	D9C020137 001
CCO-18-01-01	SW846 6020, Metals	NA	D9C020137	D9C020137 004
CCO-18-01-01	SW846 7471A, Mercury	NA	D9C020137	D9C020137 004
CCO-18-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C020137	D9C020137 004
CCO-18-01-01	SW846 8270C, PAHs	NA	D9C020137	D9C020137 004
CCO-18-01-01	MCAWW 418.1, TRPH	NA	D9C020137	D9C020137 004
OXO-18-01-01	SW846 6020, Metals	NA	D9C040124	D9C040124 001
OXO-18-01-01	SW846 7471A, Mercury	NA	D9C040124	D9C040124 001
OXO-18-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C040124	D9C040124 001
OXO-18-01-01	SW846 8270C, PAHs	NA	D9C040124	D9C040124 001
OXO-18-01-01	MCAWW 418.1, TRPH	NA	D9C040124	D9C040124 001
PAQ-18-01-01	SW846 6020, Metals	NA	D9C040124	D9C040124 002
PAQ-18-01-01	SW846 7471A, Mercury	NA	D9C040124	D9C040124 002
PAQ-18-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C040124	D9C040124 002
PAQ-18-01-01	SW846 8270C, PAHs	NA	D9C040124	D9C040124 002
PAQ-18-01-01	MCAWW 418.1, TRPH	NA	D9C040124	D9C040124 002
PSD-18-01-01	SW846 6020, Metals	NA	D9C040124	D9C040124 003
PSD-18-01-01	SW846 7471A, Mercury	NA	D9C040124	D9C040124 003
PSD-18-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C040124	D9C040124 003
PSD-18-01-01	SW846 8270C, PAHs	NA	D9C040124	D9C040124 003
PSD-18-01-01	MCAWW 418.1, TRPH	NA	D9C040124	D9C040124 003
PPI-19-01-01	SW846 6020, Metals	NA	D9C040124	D9C040124 004
PPI-19-01-01	SW846 7471A, Mercury	NA	D9C040124	D9C040124 004
PPI-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C040124	D9C040124 004
PPI-19-01-01	SW846 8270C, PAHs	NA	D9C040124	D9C040124 004
PPI-19-01-01	MCAWW 418.1, TRPH	NA	D9C040124	D9C040124 004
PPO-19-01-01	SW846 6020, Metals	NA	D9C040124	D9C040124 005
PPO-19-01-01	SW846 7471A, Mercury	NA	D9C040124	D9C040124 005
PPO-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C040124	D9C040124 005
PPO-19-01-01	SW846 8270C, PAHs	NA	D9C040124	D9C040124 005

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Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
PPO-19-01-01	MCAWW 418.1, TRPH	NA	D9C040124	D9C040124 005
AER-19-01-01	SW846 6020, Metals	NA	D9C040124	D9C040124 006
AER-19-01-01	SW846 7471A, Mercury	NA	D9C040124	D9C040124 006
AER-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C040124	D9C040124 006
AER-19-01-01	SW846 8270C, PAHs	NA	D9C040124	D9C040124 006
AER-19-01-01	MCAWW 418.1, TRPH	NA	D9C040124	D9C040124 006
CCO-19-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 001
CCO-19-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 001
CCO-19-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 001
CCO-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 001
CCO-19-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 001
CCO-19-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 001
OXO-19-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 002
OXO-19-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 002
OXO-19-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 002
OXO-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 002
OXO-19-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 002
OXO-19-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 002
PAQ-19-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 004
PAQ-19-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 004
PAQ-19-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 004
PAQ-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 004
PAQ-19-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 004
PAQ-19-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 004
PDS-19-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 003
PDS-19-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 003
PDS-19-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 003
PDS-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 003
PDS-19-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 003
PDS-19-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 003
SAQ-19-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 011
SAQ-19-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 011
SAQ-19-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 011
SAQ-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 011
SAQ-19-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 011
SAQ-19-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 011
SSD-19-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 012
SSD-19-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 012
SSD-19-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 012
SSD-19-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 012
SSD-19-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 012
SSD-19-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 012
PPI-20-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 013
PPI-20-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 013
PPI-20-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 013
PPI-20-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 013
PPI-20-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 013
PPI-20-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 013
PPO-20-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 014
PPO-20-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 014
PPO-20-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 014
PPO-20-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 014
PPO-20-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 014
PPO-20-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 014
AER-20-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 005
AER-20-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 005
AER-20-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 005
AER-20-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 005
AER-20-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 005
AER-20-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 005
CCO-20-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 006
CCO-20-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 006
CCO-20-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 006
CCO-20-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 006

Table C-3

Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
CCO-20-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 006
CCO-20-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 006
OXO-20-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 015
OXO-20-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 015
OXO-20-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 015
OXO-20-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 015
OXO-20-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 015
OXO-20-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 015
PAQ-20-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 008
PAQ-20-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 008
PAQ-20-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 008
PAQ-20-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 008
PAQ-20-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 008
PAQ-20-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 008
PSD-20-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 010
PSD-20-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 010
PSD-20-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 010
PSD-20-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 010
PSD-20-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 010
PSD-20-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 010
PPI-21-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 016
PPI-21-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 016
PPI-21-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 016
PPI-21-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 016
PPI-21-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 016
PPI-21-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 016
PAQ-21-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 007
PAQ-21-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 007
PAQ-21-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 007
PAQ-21-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 007
PAQ-21-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 007
PAQ-21-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 007
PSD-21-01-01	SW846 6020, Metals	NA	D9C030118	D9C030118 009
PSD-21-01-01	SW846 7470A, Mercury	NA	D9C030118	D9C030118 009
PSD-21-01-01	SW846 7471A, Mercury	NA	D9C030118	D9C030118 009
PSD-21-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C030118	D9C030118 009
PSD-21-01-01	SW846 8270C, PAHs	NA	D9C030118	D9C030118 009
PSD-21-01-01	MCAWW 418.1, TRPH	NA	D9C030118	D9C030118 009
CCO-27-01-01	SW846 6020, Metals	NA	D9C050126	D9C050126 001
CCO-27-01-01	SW846 7471A, Mercury	NA	D9C050126	D9C050126 001
CCO-27-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C050126	D9C050126 001
CCO-27-01-01	SW846 8270C, PAHs	NA	D9C050126	D9C050126 001
CCO-27-01-01	MCAWW 418.1, TRPH	NA	D9C050126	D9C050126 001
OXO-27-01-01	SW846 6020, Metals	NA	D9C050126	D9C050126 002
OXO-27-01-01	SW846 7471A, Mercury	NA	D9C050126	D9C050126 002
OXO-27-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C050126	D9C050126 002
OXO-27-01-01	SW846 8270C, PAHs	NA	D9C050126	D9C050126 002
OXO-27-01-01	MCAWW 418.1, TRPH	NA	D9C050126	D9C050126 002
CCO-28-01-01	SW846 6020, Metals	NA	D9C050126	D9C050126 003
CCO-28-01-01	SW846 7471A, Mercury	NA	D9C050126	D9C050126 003
CCO-28-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C050126	D9C050126 003
CCO-28-01-01	SW846 8270C, PAHs	NA	D9C050126	D9C050126 003
CCO-28-01-01	MCAWW 418.1, TRPH	NA	D9C050126	D9C050126 003
OXO-28-01-01	SW846 6020, Metals	NA	D9C050126	D9C050126 004
OXO-28-01-01	SW846 7471A, Mercury	NA	D9C050126	D9C050126 004
OXO-28-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C050126	D9C050126 004
OXO-28-01-01	SW846 8270C, PAHs	NA	D9C050126	D9C050126 004
OXO-28-01-01	MCAWW 418.1, TRPH	NA	D9C050126	D9C050126 004
CCO-29-01-01	SW846 6020, Metals	NA	D9C050126	D9C050126 005
CCO-29-01-01	SW846 7471A, Mercury	NA	D9C050126	D9C050126 005
CCO-29-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C050126	D9C050126 005
CCO-29-01-01	SW846 8270C, PAHs	NA	D9C050126	D9C050126 005
CCO-29-01-01	MCAWW 418.1, TRPH	NA	D9C050126	D9C050126 005
OXO-29-01-01	SW846 6020, Metals	NA	D9C050126	D9C050126 006

Table C-3

Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
OXO-29-01-01	SW846 7471A, Mercury	NA	D9C050126	D9C050126 006
OXO-29-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C050126	D9C050126 006
OXO-29-01-01	SW846 8270C, PAHs	NA	D9C050126	D9C050126 006
OXO-29-01-01	MCAWW 418.1, TRPH	NA	D9C050126	D9C050126 006
OXO-29-02-01	SW846 6020, Metals	NA	D9C050126	D9C050126 007
OXO-29-02-01	SW846 7471A, Mercury	NA	D9C050126	D9C050126 007
OXO-29-02-01	MCAWW 160.3 MOD, % Moisture	NA	D9C050126	D9C050126 007
OXO-29-02-01	SW846 8270C, PAHs	NA	D9C050126	D9C050126 007
OXO-29-02-01	MCAWW 418.1, TRPH	NA	D9C050126	D9C050126 007
OXO-29-03-01	SW846 6020, Metals	NA	D9C050126	D9C050126 008
OXO-29-03-01	SW846 7471A, Mercury	NA	D9C050126	D9C050126 008
OXO-29-03-01	MCAWW 160.3 MOD, % Moisture	NA	D9C050126	D9C050126 008
OXO-29-03-01	SW846 8270C, PAHs	NA	D9C050126	D9C050126 008
OXO-29-03-01	MCAWW 418.1, TRPH	NA	D9C050126	D9C050126 008
PSD-31-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 005
PSD-31-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 005
PSD-31-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 005
PSD-31-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 005
PSD-31-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 005
PPI-32-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 001
PPI-32-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 001
PPI-32-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 001
PPI-32-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 001
PPI-32-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 001
PPO-32-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 002
PPO-32-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 002
PPO-32-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 002
PPO-32-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 002
PPO-32-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 002
AER-32-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 003
AER-32-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 003
AER-32-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 003
AER-32-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 003
AER-32-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 003
CCO-32-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 004
CCO-32-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 004
CCO-32-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 004
CCO-32-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 004
CCO-32-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 004
OXO-32-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 007
OXO-32-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 007
OXO-32-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 007
OXO-32-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 007
OXO-32-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 007
PAQ-32-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 006
PAQ-32-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 006
PAQ-32-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 006
PAQ-32-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 006
PAQ-32-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 006
PSD-32-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 008
PSD-32-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 008
PSD-32-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 008
PSD-32-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 008
PSD-32-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 008
PPI-33-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 009
PPI-33-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 009
PPI-33-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 009
PPI-33-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 009
PPI-33-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 009
PPO-33-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116 010
PPO-33-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116 010
PPO-33-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116 010
PPO-33-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116 010
PPO-33-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116 010

Table C-3

Testing Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID	
AER-33-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116	011
AER-33-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116	011
AER-33-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116	011
AER-33-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116	011
AER-33-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116	011
CCO-33-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116	012
CCO-33-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116	012
CCO-33-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116	012
CCO-33-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116	012
CCO-33-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116	012
OXO-33-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116	013
OXO-33-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116	013
OXO-33-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116	013
OXO-33-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116	013
OXO-33-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116	013
PAQ-33-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116	014
PAQ-33-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116	014
PAQ-33-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116	014
PAQ-33-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116	014
PAQ-33-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116	014
PSD-33-01-01	SW846 6020, Metals	NA	D9C060116	D9C060116	015
PSD-33-01-01	SW846 7471A, Mercury	NA	D9C060116	D9C060116	015
PSD-33-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C060116	D9C060116	015
PSD-33-01-01	SW846 8270C, PAHs	NA	D9C060116	D9C060116	015
PSD-33-01-01	MCAWW 418.1, TRPH	NA	D9C060116	D9C060116	015
PPI-38-01-01	SW846 6020, Metals	NA	D9C100128	D9C100128	001
PPI-38-01-01	SW846 7471A, Mercury	NA	D9C100128	D9C100128	001
PPI-38-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C100128	D9C100128	001
PPI-38-01-01	SW846 8270C, PAHs	NA	D9C100128	D9C100128	001
PPI-38-01-01	MCAWW 418.1, TRPH	NA	D9C100128	D9C100128	001
PPO-38-01-01	SW846 6020, Metals	NA	D9C100128	D9C100128	002
PPO-38-01-01	SW846 7471A, Mercury	NA	D9C100128	D9C100128	002
PPO-38-01-01	MCAWW 160.3 MOD, % Moisture	NA	D9C100128	D9C100128	002
PPO-38-01-01	SW846 8270C, PAHs	NA	D9C100128	D9C100128	002
PPO-38-01-01	MCAWW 418.1, TRPH	NA	D9C100128	D9C100128	002
METHOD BLANK	SW846 8290, Dioxins/Furans	NA	304612	304612	0001-MB
METHOD BLANK	SW846 1668M, PCBs	NA	304612	304612	0001-MB
METHOD BLANK	SW846 8290, Dioxins/Furans	NA	304612	304612	0003-MB
METHOD BLANK	SW846 1668M, PCBs	NA	304612	304612	0003-MB
METHOD BLANK	SW846 8290, Dioxins/Furans	NA	304612	304612	0007-MB
METHOD BLANK	SW846 1668M, PCBs	NA	304612	304612	0007-MB
METHOD BLANK	SW846 8290, Dioxins/Furans	NA	304612	304612	0008-MB
METHOD BLANK	SW846 1668M, PCBs	NA	304612	304612	0008-MB
METHOD BLANK	SW846 8290, Dioxins/Furans	NA	304612	304612	0009-MB
METHOD BLANK	SW846 1668M, PCBs	NA	304612	304612	0009-MB
METHOD BLANK	SW846 8290, Dioxins/Furans	NA	304596	304596	0001-MB
METHOD BLANK	SW846 1668M, PCBs	NA	304596	304596	0001-MB
METHOD BLANK	SW846 8290, Dioxins/Furans	NA	304596	304596	0005-MB
METHOD BLANK	SW846 1668M, PCBs	NA	304596	304596	0005-MB
METHOD BLANK	SW846 8290, Dioxins/Furans	NA	304596	304596	0005-MB
METHOD BLANK	SW846 1668M, PCBs	NA	304596	304596	0005-MB

APPENDIX D

VALIDATION PHASE – SUMMARY DATA

APPENDIX D
VALIDATION PHASE – SUMMARY DATA
LIST OF TABLES

Table

D-1	Process Validation Phase Operating Conditions
D-2	Process Validation Phase PPL Metals Data
D-3	Process Validation Phase VOCs Data
D-4	Process Validation Phase PAH Data
D-5	Process Validation Phase Herbicide/Pesticide Data
D-6	Process Validation Phase PCB Data
D-7	Process Validation Phase PCB Congeners Data
D-8	Process Validation Phase Dioxin/Furan Data
D-9	Process Validation Phase General Chemistry Data
D-10	Process Validation Phase Grain Size Data
D-11	Process Validation Phase Air Data
D-12	Sample Identification Reference

Apendix D - Validation Phase Summary Data

Notes/Abbreviations:

Table D-1 - Validation Phase Operating Condition
Data indicate average values over the applicable run.
NR = Not recorded.
e = Estimated value.
c = Calculated value.

Table D-2 - Validation Phase Analytical Results Summary
B = Estimated result for metals. Result is less than reporting limit (lower detection limit).
B = Compound (non-metal) is also detected in the blank.
D = Compound quantitated using a secondary dilution.
DL = Detection limit (also reporting limt).
E = Estimated result. Concentration exceeds calibration range.
F = Reported value estimated due to an interference.
g = 2,3,7,8 - TCDF results have been confirmed on a DB-225 column.
J = Estimated result. Result is less than reporting limit (VOCs, PAHs).
j = Estimated result below the lower calibration limit but above the target detection limit.
LDL = Lower detection limit.
MBB = This analyte (metal) is present at a reportable level in the associated method blank, but is less than 5% of sample amount.
NA = Not applicable. Compound not included in analysis.
ND = Compound not detected above the lower detection limit.
TEQ = Total equivalent dioxins/furans.
U = Not detected. Associated number indicates the reporting limit.
v = Elevated detection limit due to chemical interference.

Table D-1

Process Validation Phase Operating Conditions

Batch Number Test Run Number Run/Sample Date	Optimum Operating Conditions	V1 1 3/16/99	V2 1 3/17/99	V3 1 3/17/99	V4 1 3/9/99
Unit Process/Control Variable					
Pre-Processor Mix Tank					
Total Sediment Volume (gal/batch)	1,475	1,475	1,475	1,475	1,475
Surfactant S11 (kg/batch)	1	1	1	1	2
Surfactant S12 (kg/batch)	1	1	1	1	2
Surfactant S13 (kg/batch)	1	1	1	1	2
Surfactant S14 (kg/batch)	1	1	1	1	2
Surfactant S15 (kg/batch)	0	0	0	0	0
Defoamer (pints/batch)	1	1	1	1	2
Chelating Agent (kg/batch)	3	3	3	3	3
Sodium Percarbonate (kg/batch)	4	4	4	4	4
Pre-Processor Unit					
Sediment Inlet Flow Rate (gpm)	120	123 **c**	57 **c**	114 **c**	123 **c**
Avg. Sediment Inlet Pressure (psig)	130	128	138	125	135
Avg. High Pressure Water Inlet Pressure (psig)	10,000	10,000	9,933	10,000	10,000
High Pressure Water Flow Rate (gpm)	60	60 **e**	60 **e**	60 **e**	60 **e**
Avg. Sediment Outlet Pressure (psig)	160	162	172	160	165
Aerator					
Total Aeration Time (min)	7	8	7	6	6
Total Settling Time (min)	7	9	5	7	6
Air Flow Rate (cfm)	1,000	NR-NO	NR-NO	NR-NO	NR-NO
Collision Chamber					
Avg. Sediment Inlet Flow Rate (gpm)	175	NR-NO	NR-NO	NR-NO	NR-NO
Avg. Sediment Inlet Pressure (psig)	150	150	150	150	150
Avg. High Pressure Water Inlet Pressure (psig)	10,000	10,000	10,000	10,000	10,000
High Pressure Water Flow Rate (gpm)	60	60 **e**	60 **e**	60 **e**	60 **e**
Cavitation/Oxidation Unit					
Avg. Sediment Inlet Pressure (psig)	75	75	73	NR	NR
Avg. Cav/Ox Unit Pressure (psig)	130	NR-NO	NR-NO	NR-NO	NR-NO
Cav/Ox Unit Flow Rate (gpm)	400	420	420	NR	NR
Hydrogen Peroxide Dosage (gal)	25.0	25.0	25.0	25.0	NR
Sodium Percarbonate (kg/batch)	0	0	0	0	NR
Recycle Flow Rate (gpm)	150	143	164	NR	NR
Cav/Ox Duration (min)	60	NR	NR	NR	NR
Centrifuge					
Sediment Flow Rate to Centrifuge (gpm)	50	NR-NO	NR-NO	NR-NO	NR-NO
Pond Depth Setting	3.2	3.2	NR-NO	NR-NO	NR-NO
Avg. Centrifuge Bowl Speed (rpm)	3200	3266	NR-NO	NR-NO	NR-NO
Avg. Conveyor Speed (rpm)	360	360	NR-NO	NR-NO	NR-NO
Centrifuge Centrate Flow Rate (gpm)	50	50	NR-NO	NR-NO	NR-NO

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

SEDIMENTS	**RUN V1**											
Sample ID:	**RAW-V1-SD-01**				**RAW-V1-SD-02**				**RAW-V1-SD-02-DUP**			
Receiving Date:	3/17/99				3/17/99				3/17/99			
Sample Date:	3/16/99				3/16/99				3/16/99			
Matrix:	SOLID				SOLID				SOLID			
Analyte	Result			LDL	Result			LDL	Result			LDL
Priority Pollutant Metals												
Extraction Date:	3/30/99				3/30/99				3/30/99			
Analysis Date:	4/2/99				4/2/99				4/2/99			
Antimony	1.6	mg/kg		0.31	0.16	mg/kg	B	0.32	ND	mg/kg		0.32
Arsenic	14.7	mg/kg		1.5	11.5	mg/kg		1.6	4.9	mg/kg		1.6
Beryllium	1.1	mg/kg		0.31	0.78	mg/kg		0.32	0.31	mg/kg	B	0.32
Cadmium	3.4	mg/kg		0.31	2.6	mg/kg		0.32	1	mg/kg		0.32
Chromium	172	mg/kg		0.31	133	mg/kg		0.32	50.7	mg/kg		0.32
Copper	173	mg/kg		0.31	130	mg/kg		0.32	50.9	mg/kg		0.32
Lead	181	mg/kg		1.5	147	mg/kg		0.32	52	mg/kg		0.32
Nickel	43.7	mg/kg		0.31	32.9	mg/kg		0.32	12.6	mg/kg		0.32
Selenium	1.4	mg/kg	B	1.5	1.3	mg/kg	B	1.6	0.87	mg/kg	B	1.6
Thallium	0.3	mg/kg	B	0.31	0.22	mg/kg	B	0.32	0.085	mg/kg	B	0.32
Zinc	322	mg/kg		3.1	250	mg/kg		3.2	101	mg/kg		3.2
Mercury	2.8	mg/kg		0.51	3.5	mg/kg		0.53	3.4	mg/kg		0.53
Extraction Date:	4/7/99				4/7/99				4/7/99			
Analysis Date:	4/8/99				4/8/99				4/8/99			
Silver	3.4	mg/kg		0.31	2	mg/kg		0.32	2.4	mg/kg		0.32
Extraction Date:	4/5/99				4/5/99				4/5/99			
Analysis Date:	4/6/99				4/6/99				4/6/99			

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

SOLIDS	RUN V1																	
Sample ID:	**RAW-V1-SL-01**		**PPO-V1-SL-01**		**CCO-V1-SL-01**		**OXO-V1-SL-01**		**PSD-V1-SL-01**		**PSD-V1-SL-02**		**PSD-V1-SL-02 DUP**		**PAQ-V1-SL-01**	
Receiving Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/18/99	
Sample Date:	3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
Priority Pollutant Metals																
Extraction Date:	3/25/99		3/25/99		3/25/99		3/25/99		4/1/99		3/25/99		3/25/99		3/25/99	
Analysis Date:	3/29/99		3/29/99		3/29/99		3/29/99		4/6/99		3/29/99		3/29/99		3/29/99	
Antimony	ND mg/kg	0.17	ND mg/kg	0.17	ND mg/kg	0.18	ND mg/kg	0.15	0.09 mg/kg B	0.14	ND mg/kg	0.14	ND mg/kg	0.14	0.16 mg/kg B	0.31
Arsenic	12.9 mg/kg	0.85	9.8 mg/kg	0.84	11.8 mg/kg	0.89	8.7 mg/kg	0.76	8.4 mg/kg	0.72	8.6 mg/kg	0.71	8.1 mg/kg	0.71	20.2 mg/kg	1.5
Beryllium	0.96 mg/kg	0.17	0.75 mg/kg	0.17	0.78 mg/kg	0.18	0.56 mg/kg	0.15	0.4 mg/kg	0.14	0.53 mg/kg	0.14	0.48 mg/kg	0.14	1.6 mg/kg	0.31
Cadmium	3.6 mg/kg	0.17	2.2 mg/kg	0.17	3.1 mg/kg	0.18	1.4 mg/kg	0.15	1.3 mg/kg	0.14	1.3 mg/kg	0.14	1.2 mg/kg	0.14	4.3 mg/kg	0.31
Chromium	186 mg/kg	0.85	125 mg/kg	0.17	144 mg/kg	0.18	72.2 mg/kg	0.15	47.9 mg/kg	0.14	62.4 mg/kg	0.14	60.2 mg/kg	0.14	340 mg/kg	1.5
Copper	179 mg/kg	0.85	106 mg/kg	0.17	170 mg/kg	0.18	67.9 mg/kg	0.15	58.4 mg/kg	0.14	62 mg/kg	0.14	58.5 mg/kg	0.14	294 mg/kg	0.31
Lead	172 mg/kg	0.85	113 mg/kg	0.84	125 mg/kg	0.89	74.7 mg/kg	0.76	71.1 mg/kg	0.72	70.1 mg/kg	0.14	66.7 mg/kg	0.14	295 mg/kg	1.5
Nickel	33.9 mg/kg	0.17	32.8 mg/kg	0.17	43.1 mg/kg	0.18	28.7 mg/kg	0.15	25.7 mg/kg	0.14	28.4 mg/kg	0.14	26.8 mg/kg	0.14	51.7 mg/kg	0.31
Selenium	1.1 mg/kg	0.85	0.71 mg/kg B	0.84	0.88 mg/kg B	0.89	0.48 mg/kg B	0.76	0.48 mg/kg B	0.72	0.51 mg/kg B	0.71	0.49 mg/kg B	0.71	1.6 mg/kg	1.5
Silver	3.4 mg/kg	0.17	2.1 mg/kg	0.17	2.5 mg/kg	0.18	1.2 mg/kg	0.15	0.96 mg/kg	0.14	1.1 mg/kg	0.14	1 mg/kg	0.14	6.8 mg/kg	0.31
Thallium	0.21 mg/kg	0.17	0.23 mg/kg	0.17	0.24 mg/kg	0.18	0.21 mg/kg	0.15	0.2 mg/kg	0.14	0.21 mg/kg	0.14	0.2 mg/kg	0.14	0.29 mg/kg B	0.31
Zinc	322 mg/kg	1.7	221 mg/kg	1.7	246 mg/kg	1.8	143 mg/kg	1.5	134 mg/kg	1.4	135 mg/kg	1.4	129 mg/kg	1.4	430 mg/kg	3.1
Mercury	4.4 mg/kg	0.28	2.8 mg/kg	0.28	3.2 mg/kg	0.3	1.6 mg/kg	0.25	0.42 mg/kg	0.047	0.27 mg/kg	0.24	1.6 mg/kg	0.24	9.1 mg/kg	0.51
Extraction Date:	4/7/99		4/7/99		4/7/99		4/7/99		3/24/99		3/24/99		4/7/99		4/7/99	
Analysis Date:	4/8/99		4/8/99		4/8/99		4/8/99		4/7/99		4/7/99		4/8/99		4/8/99	

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

AQUEOUS	RUN V1																							
Sample ID:	**RAW-V1-AQ-01**			**PPO-V1-AQ-01**			**CCO-V1-AQ-01**			**OXO-V1-AQ-01**			**PAQ-V1-AQ-01**			**PAQ-V1-AQ-02**			**PAQ-V1-AQ-02-DUP**			**PAQ-V1-AQ-03**			**PAQ-V1-AQ-03-DUP**		
Receiving Date:	3/17/99			3/17/99			3/17/99			3/17/99			3/18/99			3/18/99			3/18/99			4/17/99			4/17/99		
Sample Date:	3/16/99			3/16/99			3/16/99			3/16/99			3/16/99			3/16/99			3/16/99			3/16/99			3/16/99		
Matrix:	WATER			WATER			WATER			WATER			WATER			WATER			WATER			WATER			WATER		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Priority Pollutant Metals																											
Extraction Date:	3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			4/22/99			4/22/99		
Analysis Date:	4/1/99			4/1/99			4/1/99			4/1/99			4/1/99			4/1/99			4/1/99			4/28/99			4/28/99		
Antimony	17.2 ug/L	B	100	ND ug/L		100	ND ug/L		100	0.2 ug/L	B	100	33.8 ug/L	B	100	6.6 ug/L	B	100	ND ug/L		100	31.5 ug/L		5	18.8 ug/L		1
Arsenic	438 ug/L	B	500	40.3 ug/L	B	500	27.2 ug/L	B	500	54.1 ug/L	B	500	125 ug/L	B	500	124 ug/L	B	500	110 ug/L	B	500	61.7 ug/L		25	47.2 ug/L		5
Beryllium	26.2 ug/L	B	100	0.47 ug/L	B	100	0.82 ug/L	B	100	2.1 ug/L	B	100	7.2 ug/L	B	100	8.5 ug/L	B	100	6.7 ug/L	B	100	0.35 ug/L	B	5	0.097 ug/L	B	1
Cadmium	129 ug/L		100	8 ug/L	B	100	23.6 ug/L	B	100	122 ug/L		100	154 ug/L		100	153 ug/L		100	149 ug/L		100	9.8 ug/L		5	45.3 ug/L		1
Chromium	7,730 ug/L		100	149 ug/L		100	157 ug/L		100	956 ug/L		100	1,740 ug/L		100	2,040 ug/L		100	1,860 ug/L		100	80 ug/L		5	78.6 ug/L		1
Lead	6,600 ug/L		100	2,190 ug/L		100	1,570 ug/L		100	1,300 ug/L		100	2,180 ug/L		100	2,210 ug/L		100	2,120 ug/L		100	431 ug/L		5	595 ug/L		5
Nickel	1,490 ug/L		100	105 ug/L		100	68.8 ug/L	B	100	500 ug/L		100	537 ug/L		100	576 ug/L		100	539 ug/L		100	NA ug/L			NA ug/L		
Selenium	14.4 ug/L	B	500	8.2 ug/L	B	500	ND ug/L		500	19.9 ug/L	B	500	20.3 ug/L	B	500	21 ug/L	B	500	ND ug/L		500	ND ug/L		5	10.4 ug/L		5
Silver	190 ug/L		100	2.1 ug/L	B	100	2 ug/L	B	100	9.9 ug/L	B	100	34.8 ug/L	B	100	40.6 ug/L	B	100	37.3 ug/L	B	100	1.1 ug/L	B	5	1.1 ug/L		1
Thallium	4.7 ug/L	B	100	0.86 ug/L	B	100	0.94 ug/L	B	100	1.3 ug/L	B	100	2.3 ug/L	B	100	1.9 ug/L	B	100	1.9 ug/L	B	100	0.3 ug/L	B	5	ND ug/L		1
Zinc	11,000 ug/L		1,000	1,120 ug/L		1,000	997 ug/L	B	1,000	10,100 ug/L		1,000	11,000 ug/L		1,000	11,000 ug/L		1,000	10,400 ug/L		1,000	5,570 ug/L		50	7,460 ug/L		50
Copper	7,500 ug/L		100	159 ug/L		100	128 ug/L		100	5,130 ug/L		100	4,170 ug/L		100	4,310 ug/L		100	4,650 ug/L		100	133 ug/L		5	312 ug/L		1
Extraction Date:				3/29/99			3/29/99			3/29/99									3/29/99			4/22/99			4/22/99		
Analysis Date:				4/2/99			4/2/99			4/2/99									4/2/99			4/28/99			4/28/99		
Mercury	141 ug/L		4	3.7 ug/L		0.2	3.2 ug/L		0.2	11.4 ug/L		0.4	47.2 ug/L		2	46.8 ug/L		2	41.7 ug/L		2	ug/L			1.3 ug/L		0.2
Extraction Date:	3/24/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			4/23/99			4/23/99		
Analysis Date:	3/25/99			3/30/99			3/30/99			3/30/99			3/30/99			3/30/99			3/30/99			4/26/99			4/26/99		

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

SEDIMENTS	**RUN V2**			
Sample ID:	**RAW-V2-SD-01**			
Receiving Date:	31899			
Sample Date:	31699			
Matrix:	SOLID			
Analyte	Result			LDL
Priority Pollutant Metals				
Extraction Date:	3/30/99			
Analysis Date:	4/2/99			
Antimony	ND	mg/kg		0.26
Arsenic	11.2	mg/kg		1.3
Beryllium	0.76	mg/kg		0.26
Cadmium	2.6	mg/kg		0.26
Chromium	128	mg/kg		0.26
Copper	122	mg/kg		0.26
Lead	134	mg/kg		1.3
Nickel	30.8	mg/kg		0.26
Selenium	1.2	mg/kg	B	1.3
Thallium	0.21	mg/kg	B	0.26
Zinc	236	mg/kg		2.6
Mercury	3.5	mg/kg		0.43
Extraction Date:	4/7/99			
Analysis Date:	4/8/99			
Silver	1.7	mg/kg		0.26
Extraction Date:	4/5/99			
Analysis Date:	4/6/99			

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

SOLIDS	**RUN V2**											
Sample ID:	**RAW-V2-SL-01**		**PPO-V2-SL-01**		**CCO-V2-SL-01**		**OXO-V2-SL-01**		**PSD-V2-SL-01**		**PAQ-V2-SL-01**	
Receiving Date:	31899		31899		31899		31899		31899		31899	
Sample Date:	31699		31799		31799		31799		31799		31799	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
Priority Pollutant Metals												
Extraction Date:	3/25/99		3/25/99		3/25/99		3/25/99		3/25/99		3/25/99	
Analysis Date:	3/29/99		3/29/99		3/29/99		3/29/99		3/29/99		3/29/99	
Antimony	0.044 mg/kg B	0.17	0.023 mg/kg B	0.17	0.023 mg/kg B	0.2	ND mg/kg	0.16	0.067 mg/kg	0.14	0.023 mg/kg B	0.3
Arsenic	11.7 mg/kg	0.86	13.6 mg/kg	0.85	17.3 mg/kg	1	9.3 mg/kg	0.81	6.7 mg/kg	0.7	24.3 mg/kg	1.5
Beryllium	0.78 mg/kg	0.17	0.91 mg/kg	0.17	1.3 mg/kg	0.2	0.54 mg/kg	0.16	0.41 mg/kg	0.14	1.9 mg/kg	0.3
Cadmium	2.4 mg/kg	0.17	3.4 mg/kg	0.17	5.2 mg/kg	0.2	1.3 mg/kg	0.16	1.1 mg/kg	0.14	5.3 mg/kg	0.3
Chromium	135 mg/kg	0.17	162 mg/kg	0.17	283 mg/kg	1	61.3 mg/kg	0.16	49 mg/kg	0.14	424 mg/kg	1.5
Copper	129 mg/kg	0.17	141 mg/kg	0.17	269 mg/kg	1	61.1 mg/kg	0.16	49.5 mg/kg	0.14	343 mg/kg	1.5
Lead	130 mg/kg	0.86	161 mg/kg	0.85	243 mg/kg	1	71.3 mg/kg	0.16	57.2 mg/kg	0.14	356 mg/kg	1.5
Nickel	34.2 mg/kg	0.17	42.9 mg/kg	0.17	50.3 mg/kg	0.2	30.3 mg/kg	0.16	22.6 mg/kg	0.14	63.3 mg/kg	0.3
Selenium	0.84 mg/kg B	0.86	1 mg/kg	0.85	1.4 mg/kg	1	0.49 mg/kg B	0.81	0.45 mg/kg B	0.7	1.8 mg/kg	1.5
Silver	2.6 mg/kg	0.17	2.7 mg/kg	0.17	5.8 mg/kg	0.2	1.1 mg/kg	0.16	0.83 mg/kg	0.14	7.8 mg/kg	0.3
Thallium	0.23 mg/kg	0.17	0.3 mg/kg	0.17	0.3 mg/kg	0.2	0.22 mg/kg	0.16	0.17 mg/kg	0.14	0.39 mg/kg	0.3
Zinc	228 mg/kg	1.7	314 mg/kg	1.7	435 mg/kg	10	142 mg/kg	1.6	106 mg/kg	1.4	493 mg/kg	3
Mercury	3.1 mg/kg	0.29	4.4 mg/kg	0.28	5.2 mg/kg	0.33	1.4 mg/kg	0.27	0.26 mg/kg	0.23	10.2 mg/kg	0.5
Extraction Date:	3/24/99		3/24/99		3/24/99		3/24/99		3/24/99		3/24/99	
Analysis Date:	4/7/99		4/7/99		4/7/99		4/7/99		4/7/99		4/7/99	

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

AQUEOUS	**RUN V2**																	
Sample ID:	**RAW-V2-AQ-01**			**PPO-V2-AQ-01**			**CCO-V2-AQ-01**			**OXO-V2-AQ-01**			**PAQ-V2-AQ-01**			**PAQ-V2-AQ-03**		
Receiving Date:	3/18/99			3/18/99			3/18/99			3/18/99			3/18/99			4/17/99		
Sample Date:	3/16/99			3/17/99			3/17/99			3/17/99			3/17/99			3/17/99		
Matrix:	WATER			WATER			WATER			WATER			WATER			WATER		
Analyte	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL
Priority Pollutant Metals																		
Extraction Date:	3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			4/22/99		
Analysis Date:	4/1/99			4/1/99			4/1/99			4/1/99			4/1/99			4/28/99		
Antimony	ND ug/L		100	ND ug/L		100	ND ug/L		100	ND ug/L		100	ND ug/L		100	19.6 ug/L		1
Arsenic	286 ug/L	B	500	68 ug/L	B	500	36.9 ug/L	B	500	123 ug/L	B	500	57.6 ug/L	B	500	41.8 ug/L		5
Beryllium	19.7 ug/L	B	100	2.9 ug/L	B	100	0.53 ug/L	B	100	5.8 ug/L	B	100	1.1 ug/L	B	100	ND ug/L		1
Cadmium	92 ug/L	B	100	12.5 ug/L	B	100	13.1 ug/L	B	100	123 ug/L		100	118 ug/L		100	92.5 ug/L		1
Chromium	4,730 ug/L		100	770 ug/L		100	315 ug/L		100	2,120 ug/L		100	816 ug/L		100	59.5 ug/L		1
Lead	4,840 ug/L		100	1,730 ug/L		100	1,170 ug/L		100	2,270 ug/L		100	1,070 ug/L		100	474 ug/L		1
Nickel	670 ug/L		100	107 ug/L		100	66.3 ug/L	B	100	499 ug/L		100	388 ug/L		100	NA ug/L		
Selenium	30.1 ug/L	B	500	3.2 ug/L	B	500	ND ug/L		500	11.2 ug/L	B	500	5.4 ug/L	B	500	8.3 ug/L		5
Silver	111 ug/L		100	17.5 ug/L	B	100	4.9 ug/L	B	100	38.2 ug/L	B	100	16.9 ug/L	B	100	1.5 ug/L		1
Thallium	3 ug/L	B	100	1.2 ug/L	B	100	1.1 ug/L	B	100	2 ug/L	B	100	1.2 ug/L	B	100	0.029 ug/L	B	1
Zinc	7,630 ug/L		1,000	1,770 ug/L		1,000	990 ug/L	B	1,000	9,480 ug/L		1,000	8,350 ug/L		1,000	6,910 ug/L		50
Copper	5,370 ug/L		100	792 ug/L		100	286 ug/L		100	4,910 ug/L		100	3,680 ug/L		100	655 ug/L		1
Extraction Date:	3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			4/22/99		
Analysis Date:	4/2/99			4/2/99			4/2/99			4/2/99			4/2/99			4/28/99		
Mercury	155 ug/L		4	11.7 ug/L		0.4	5.6 ug/L		0.2	53.8 ug/L		2	15 ug/L		0.4	0.98 ug/L		0.2
Extraction Date:	3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			4/23/99		
Analysis Date:	3/30/99			3/30/99			3/30/99			3/30/99			3/30/99			4/28/99		

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

SEDIMENTS	**RUN V3**					
Sample ID:	**RAW-V3-SD-01**			**CBK-V3-SD-01**		
Receiving Date:	3/18/99			3/18/99		
Sample Date:	3/17/99			3/17/99		
Matrix:	SOLID			SOLID		
Analyte	Results		LDL	Results		LDL
Priority Pollutant Metals						
Extraction Date:	3/30/99			3/30/99		
Analysis Date:	4/2/99			4/2/99		
Antimony	ND	mg/kg	0.28	ND	mg/kg	0.32
Arsenic	8.3	mg/kg	1.4	0.53	mg/kg	1.6
Beryllium	0.56	mg/kg	0.28	0.46	mg/kg	0.32
Cadmium	1.9	mg/kg	0.28	0.075	mg/kg	0.32
Chromium	97.4	mg/kg	0.28	22.6	mg/kg	0.32
Copper	89.7	mg/kg	0.28	2	mg/kg	0.32
Lead	95.8	mg/kg	0.28	24.2	mg/kg	0.32
Nickel	22.3	mg/kg	0.28	3	mg/kg	0.32
Selenium	1.1	mg/kg B	1.4	0.11	mg/kg	1.6
Thallium	0.16	mg/kg B	0.28	0.042	mg/kg	0.32
Zinc	175	mg/kg	2.8	7.7	mg/kg	3.2
Mercury	3.1	mg/kg	0.46	ND	mg/kg	0.53
Extraction Date:	4/7/99			4/7/99		
Analysis Date:	4/8/99			4/8/99		
Silver	1.7	mg/kg	0.28	0.05	mg/kg	0.32
Extraction Date:	4/5/99			4/5/99		
Analysis Date:	4/6/99			4/6/99		

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

SOLIDS	**RUN V3**											
Sample ID:	**RAW-V3-SL-01**		**PPO-V3-SL-01**		**CCO-V3-SL-01**		**OXO-V3-SL-01**		**PSD-V3-SL-01**		**PAQ-V3-SL-01**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/19/99		3/19/99	
Sample Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL
Priority Pollutant Metals												
Extraction Date:	3/25/99		3/25/99		3/25/99		3/25/99		4/1/99		4/1/99	
Analysis Date:	3/29/99		3/29/99		3/29/99		3/29/99		4/6/99		4/6/99	
Antimony	0.033 mg/kg B	0.17	ND mg/kg	0.15	ND mg/kg	0.15	ND mg/kg	0.16	0.085 mg/kg B	0.15	0.091 mg/kg B	
Arsenic	12.3 mg/kg	0.85	9.8 mg/kg	0.75	9.7 mg/kg	0.74	13 mg/kg	0.82	8.4 mg/kg	0.74	28 mg/kg	
Beryllium	0.84 mg/kg	0.17	0.54 mg/kg	0.15	0.61 mg/kg	0.15	0.99 mg/kg	0.16	0.42 mg/kg	0.15	1.7 mg/kg	
Cadmium	3.4 mg/kg	0.17	1.4 mg/kg	0.15	2.1 mg/kg	0.15	2.6 mg/kg	0.16	1.3 mg/kg	0.15	5.8 mg/kg	
Chromium	187 mg/kg	0.85	72.8 mg/kg	0.15	107 mg/kg	0.15	184 mg/kg	0.82	51.6 mg/kg	0.15	425 mg/kg	
Copper	186 mg/kg	0.85	70.9 mg/kg	0.15	94.2 mg/kg	0.15	161 mg/kg	0.82	62 mg/kg	0.15	363 mg/kg	
Lead	168 mg/kg	0.85	74.6 mg/kg	0.15	101 mg/kg	0.74	160 mg/kg	0.82	75.5 mg/kg	0.74	387 mg/kg	
Nickel	29 mg/kg	0.17	29.6 mg/kg	0.15	28.8 mg/kg	0.15	36.3 mg/kg	0.16	25.5 mg/kg	0.15	63.9 mg/kg	
Selenium	1 mg/kg	0.85	0.59 mg/kg B	0.75	0.68 mg/kg B	0.74	0.94 mg/kg	0.82	0.49 mg/kg B	0.74	2.1 mg/kg	
Silver	3.9 mg/kg	0.17	1.5 mg/kg	0.15	2 mg/kg	0.15	3.9 mg/kg	0.16	1 mg/kg	0.15	10.8 mg/kg	
Thallium	0.19 mg/kg	0.17	0.2 mg/kg	0.15	0.19 mg/kg	0.15	0.21 mg/kg	0.16	0.21 mg/kg	0.15	0.36 mg/kg	
Zinc	286 mg/kg	1.7	143 mg/kg	1.5	195 mg/kg	1.5	251 mg/kg	1.6	152 mg/kg	1.5	3.2 mg/kg	
Mercury	4.2 mg/kg	0.28	1.9 mg/kg	0.25	1.3 mg/kg	0.25	3.4 mg/kg	0.27	0.21 mg/kg	0.049	1.8 mg/kg	
Extraction Date:	3/24/99		3/24/99		3/24/99		4/7/99		3/24/99		3/24/99	
Analysis Date:	4/7/99		4/7/99		4/7/99		4/8/99		4/7/99		4/7/99	

Table D-2
BioGenesis Demonstration Project
Validation Test Runs
Priority Pollutant Metals Data

AQUEOUS	RUN V3																							
Sample ID:	**RAW-V3-AQ-01**			**PPO-V3-AQ-01**			**CCO-V3-AQ-01**			**OXO-V3-AQ-01**			**PAQ-V3-AQ-01**			**PSW-V3-AQ-01**			**FBK-V3-AQ-02**			**PAQ-V3-AQ-03**			**PSW-V3-AQ-03**		
Receiving Date:	3/19/99			3/18/99			3/18/99			3/18/99			3/18/99			3/19/99			3/19/99			4/17/99			4/17/99		
Sample Date:	3/17/99			3/17/99			3/17/99			3/17/99			3/16/99			3/18/99						3/16/99			3/18/99		
Matrix:	WATER			WATER			WATER			WATER			WATER			WATER			WATER			WATER			WATER		
Analyte	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL
Priority Pollutant Metals																											
Extraction Date:	3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			4/22/99			4/22/99		
Analysis Date:	4/1/99			4/1/99			4/1/99			4/1/99			4/1/99			4/1/99			4/1/99			4/28/99			4/28/99		
Antimony	ND ug/L		100	ND ug/L		100	ND ug/L		100	ND ug/L		100	ND ug/L		100	ND ug/L		1	NA ug/L			28.8 ug/L		1	ND ug/L	G	1.4
Arsenic	959 ug/L		500	109 ug/L	B	500	48.2 ug/L	B	500	74.9 ug/L	B	500	91.8 ug/L	B	500	0.21 ug/L	B	5	ND ug/L		5	49.9 ug/L		5	1 ug/L	B	
Beryllium	68.9 ug/L	B	100	6.4 ug/L	B	100	1.7 ug/L	B	100	5.2 ug/L	B	100	5.3 ug/L	B	100	ND ug/L		1	ND ug/L		5	ND ug/L		1	ND ug/L		1
Cadmium	320 ug/L		100	25.3 ug/L	B	100	11.8 ug/L	B	100	162 ug/L		100	153 ug/L		100	ND ug/L		1	0.064 ug/L	B	1	33.2 ug/L		1	ND ug/L		1
Chromium	17,600 ug/L		100	1,440 ug/L		100	558 ug/L		100	1,000 ug/L		100	1,290 ug/L		100	0.21 ug/L	B	1	1.5 ug/L		1	122 ug/L		1	0.75 ug/L	B	
Lead	15,800 ug/L		100	3,270 ug/L		100	1,940 ug/L		100	1,950 ug/L		100	2,060 ug/L		100	1 ug/L	B	1	2.5 ug/L		1	805 ug/L		5	ND ug/L		1
Nickel	2,270 ug/L		100	214 ug/L		100	101 ug/L		100	364 ug/L		100	432 ug/L		100	1.1 ug/L		1	1 ug/L		1	NA ug/L			NA ug/L		
Selenium	33.9 ug/L	B	500	10.7 ug/L	B	500	ND ug/L		500	21.7 ug/L	B	500	9 ug/L	B	500	ND ug/L		1	0.94 ug/L	B	1	7 ug/L		5	ND ug/L		5
Silver	465 ug/L		100	30.7 ug/L	B	100	9.1 ug/L	B	100	11.2 ug/L	B	100	22.9 ug/L	B	100	ND ug/L		1	1 ug/L		1	1.1 ug/L			ND ug/L		1
Thallium	9 ug/L	B	100	1.4 ug/L	B	100	0.86 ug/L	B	100	1.8 ug/L	B	100	1 ug/L	B	100	ND ug/L		1	ND ug/L		1	ND ug/L		1	ND ug/L		1
Zinc	26,000 ug/L		1,000	2,730 ug/L		1,000	1,530 ug/L		1,000	10,900 ug/L		1,000	10,800 ug/L		1,000	217 ug/L		10	37.7 ug/L		10	9120 ug/L		50	37.1 ug/L		10
Copper	18,200 ug/L		100	1,530 ug/L		100	595 ug/L		100	4,450 ug/L		100	4,220 ug/L		100	9 ug/L		1	2.5 ug/L		1	167.0 ug/L		1	3.2 ug/L		1
Extraction Date:	3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			4/22/99			4/22/99		
Analysis Date:	4/1/99			4/2/99			4/2/99			4/2/99			4/1/99			4/1/99			4/1/99			4/28/99			4/28/99		
Mercury	372 ug/L		20	31.7 ug/L		2	12.6 ug/L		0.4	21.4 ug/L		1	23.7 ug/L		1	ND ug/L		0.2	ND ug/L		0.2	0.45 ug/L		0.2	ND ug/L		0.2
Extraction Date:	3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			3/29/99			4/23/99			4/23/99		
Analysis Date:	3/30/99			3/30/99			3/30/99			3/30/99			3/30/99			3/30/99			3/30/99			4/26/99			4/26/99		

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

SEDIMENTS	**RUN V1**								
Sample ID:	**RAW-V1-SD-01**			**RAW-V1-SD-02**			**RAW-V1-SD-02-DUP**		
Receiving Date	3/17/99			3/17/99			3/17/99		
Sample Date									
Extraction Date	3/22/99			3/22/99			3/22/99		
Analysis Date:	3/22/99			3/22/99			3/22/99		
Matrix	SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL
Volatile Organics									
Acetone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19
Benzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Bromodichloromethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Bromoform	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Bromomethane	ND	ug/kg	9.9	ND	ug/kg	9.9	ND	ug/kg	9.4
2-Butanone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19
Carbon disulfide	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Carbon tetrachloride	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Chlorobenzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Dibromochloromethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Chloroethane	ND	ug/kg	9.9	ND	ug/kg	9.9	ND	ug/kg	9.4
Chloroform	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Chloromethane	ND	ug/kg	9.9	ND	ug/kg	9.9	ND	ug/kg	9.4
1,1-Dichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
1,2-Dichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
1,1-Dichloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
1,2-Dichloroethene (total)	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
1,2-Dichloropropane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
cis-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
trans-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Ethylbenzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
2-Hexanone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19
Methylene chloride	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
4-Methyl-2-pentanone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19
Styrene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Tetrachloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Toluene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
1,1,1-Trichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
1,1,2-Trichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Trichloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7
Vinyl chloride	ND	ug/kg	9.9	ND	ug/kg	9.9	ND	ug/kg	9.4
Xylenes (total)	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	4.7

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

SOLIDS	**RUN V1**																	
Sample ID:	**RAW-V1-SL-01**			**PSD-V1-SL-01**			**PSD-V1-SL-02**			**PSD-V1-SL-02-DUP**			**PAQ-V1-SL-01**		
Receiving Date	3/17/99			3/17/99			3/17/99			3/17/99			3/18/99		
Sample Date															
Extraction Date	3/24/99			3/24/99			3/24/99			3/24/99			3/24/99		
Analysis Date:	3/24/99			3/24/99			3/24/99			3/24/99			3/24/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Volatile Organics															
Acetone	3.2	ug/kg J		37	ug/kg B		42	ug/kg		27	ug/kg B		26	ug/kg	
Benzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Bromodichloromethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Bromoform	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Bromomethane	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	9.9
2-Butanone	ND	ug/kg	20	10	ug/kg J		9.3	ug/kg J		8	ug/kg J		ND	ug/kg	20
Carbon disulfide	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Carbon tetrachloride	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Chlorobenzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Dibromochloromethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Chloroethane	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	9.9
Chloroform	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Chloromethane	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	9.9
1,1-Dichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,1-Dichloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloroethene (total)	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloropropane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
cis-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
trans-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Ethylbenzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
2-Hexanone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20
Methylene chloride	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
4-Methyl-2-pentanone	ND	ug/kg	20	4.6	ug/kg J		ND	ug/kg	20	4	ug/kg J		ND	ug/kg	20
Styrene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Tetrachloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Toluene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,1,1-Trichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,1,2-Trichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Trichloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Vinyl chloride	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	9.9
Xylenes (total)	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

AQUEOUS	**RUN V1**																	
Sample ID:	**RAW-V1-AQ-01**				**PAQ-V1-AQ-01**				**PAQ-V1-AQ-02**				**PAQ-V1-AQ-02-DUP**				**TB-V1-AQ-02**			
Receiving Date	3/17/99				3/18/99				3/18/99				3/18/99				36236			
Sample Date																				
Extraction Date	3/19/99				3/22/99				3/22/99				3/22/99				36238			
Analysis Date:	3/19/99				3/22/99				3/22/99				3/22/99				36238			
Matrix	WATER				WATER				WATER				WATER				WATER			
Analyte	Result			LDL	Result			LDL	Result			LDL	Result			LDL	Result			LDL
Volatile Organics																				
Acetone	5.8	ug/L	J		99	ug/L			100	ug/L			100	ug/L			4.2	ug/L	J	
Benzene	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Bromodichloromethane	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Bromoform	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Bromomethane	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10
2-Butanone	ND	ug/L		20	27	ug/L			26	ug/L			27	ug/L			ND	ug/L		20
Carbon disulfide	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Carbon tetrachloride	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Chlorobenzene	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Dibromochloromethane	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Chloroethane	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10
Chloroform	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Chloromethane	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10
1,1-Dichloroethane	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
1,2-Dichloroethane	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
1,1-Dichloroethene	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
1,2-Dichloroethene (total)	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
1,2-Dichloropropane	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
cis-1,3-Dichloropropene	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
trans-1,3-Dichloropropene	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Ethylbenzene	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
2-Hexanone	ND	ug/L		20	ND	ug/L		20	ND	ug/L		20	ND	ug/L		20	ND	ug/L		20
Methylene chloride	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
4-Methyl-2-pentanone	ND	ug/L		20	15	ug/L	J		15	ug/L	J		15	ug/L	J		ND	ug/L		20
Styrene	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
1,1,2,2-Tetrachloroethane	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Tetrachloroethene	2	ug/L	J		ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Toluene	1.1	ug/L	J		ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
1,1,1-Trichloroethane	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
1,1,2-Trichloroethane	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Trichloroethene	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5
Vinyl chloride	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10	ND	ug/L		10
Xylenes (total)	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5	ND	ug/L		5

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

SEDIMENTS	**RUN V2**			
Sample ID:	**RAW-V2-SD-01**			
Receiving Date	3/18/99			
Sample Date				
Extraction Date	3/25/99			
Analysis Date:	3/25/99			
Matrix	SOLID			
Analyte	Result			LDL
Volatile Organics				
Acetone	6.1	ug/kg	JB	
Benzene	ND	ug/kg		5
Bromodichloromethane	ND	ug/kg		5
Bromoform	ND	ug/kg		5
Bromomethane	ND	ug/kg		10
2-Butanone	ND	ug/kg		20
Carbon disulfide	ND	ug/kg		5
Carbon tetrachloride	ND	ug/kg		5
Chlorobenzene	ND	ug/kg		5
Dibromochloromethane	ND	ug/kg		5
Chloroethane	ND	ug/kg		10
Chloroform	ND	ug/kg		5
Chloromethane	ND	ug/kg		10
1,1-Dichloroethane	ND	ug/kg		5
1,2-Dichloroethane	ND	ug/kg		5
1,1-Dichloroethene	ND	ug/kg		5
1,2-Dichloroethene (total)	ND	ug/kg		5
1,2-Dichloropropane	ND	ug/kg		5
cis-1,3-Dichloropropene	ND	ug/kg		5
trans-1,3-Dichloropropene	ND	ug/kg		5
Ethylbenzene	ND	ug/kg		5
2-Hexanone	ND	ug/kg		20
Methylene chloride	ND	ug/kg		5
4-Methyl-2-pentanone	ND	ug/kg		20
Styrene	ND	ug/kg		5
1,1,2,2-Tetrachloroethane	ND	ug/kg		5
Tetrachloroethene	ND	ug/kg		5
Toluene	ND	ug/kg		5
1,1,1-Trichloroethane	ND	ug/kg		5
1,1,2-Trichloroethane	ND	ug/kg		5
Trichloroethene	ND	ug/kg		5
Vinyl chloride	ND	ug/kg		10
Xylenes (total)	ND	ug/kg		5

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

SOLIDS	**RUN V2**											
Sample ID:	**RAW-V2-SL-01**				**PSD-V2-SL-01**				**PAQ-V2-SL-01**			
Receiving Date	3/18/99				3/18/99				3/18/99			
Sample Date												
Extraction Date	3/25/99				3/24/99				3/25/99			
Analysis Date:	3/25/99				3/24/99				3/25/99			
Matrix	SOLID				SOLID				SOLID			
Analyte	Result			LDL	Result			LDL	Result			LDL
Volatile Organics												
Acetone	8.7	ug/kg	JB		20	ug/kg			13	ug/kg	JB	
Benzene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Bromodichloromethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Bromoform	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Bromomethane	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10
2-Butanone	ND	ug/kg		20	5.7	ug/kg	J		ND	ug/kg		20
Carbon disulfide	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Carbon tetrachloride	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Chlorobenzene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Dibromochloromethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Chloroethane	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10
Chloroform	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Chloromethane	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10
1,1-Dichloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,2-Dichloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,1-Dichloroethene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,2-Dichloroethene (total)	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,2-Dichloropropane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
cis-1,3-Dichloropropene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
trans-1,3-Dichloropropene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Ethylbenzene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
2-Hexanone	ND	ug/kg		20	ND	ug/kg		20	ND	ug/kg		20
Methylene chloride	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
4-Methyl-2-pentanone	ND	ug/kg		20	ND	ug/kg		20	ND	ug/kg		20
Styrene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,1,2,2-Tetrachloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Tetrachloroethene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Toluene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,1,1-Trichloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
1,1,2-Trichloroethane	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Trichloroethene	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5
Vinyl chloride	ND	ug/kg		10	ND	ug/kg		10	ND	ug/kg		10
Xylenes (total)	ND	ug/kg		5	ND	ug/kg		5	ND	ug/kg		5

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

AQUEOUS	**RUN V2**							
Sample ID:	**RAW-V2-AQ-01**				**PAQ-V2-AQ-03**			
Receiving Date	3/18/99				4/17/99			
Sample Date								
Extraction Date	3/22/99				4/20/99			
Analysis Date:	3/22/99				4/20/99			
Matrix	WATER				WATER			
Analyte	Result			LDL	Result			LDL
Volatile Organics								
Acetone	19	ug/L	J		26	ug/L	J	
Benzene	ND	ug/L		5	ND	ug/L		10
Bromodichloromethane	ND	ug/L		5	ND	ug/L		10
Bromoform	ND	ug/L		5	ND	ug/L		10
Bromomethane	ND	ug/L		10	ND	ug/L		20
2-Butanone	5	ug/L	J		16	ug/L	J	
Carbon disulfide	ND	ug/L		5	ND	ug/L		10
Carbon tetrachloride	ND	ug/L		5	ND	ug/L		10
Chlorobenzene	ND	ug/L		5	ND	ug/L		10
Dibromochloromethane	ND	ug/L		5	ND	ug/L		10
Chloroethane	ND	ug/L		10	ND	ug/L		10
Chloroform	ND	ug/L		5	ND	ug/L		20
Chloromethane	ND	ug/L		10	ND	ug/L		10
1,1-Dichloroethane	ND	ug/L		5	ND	ug/L		20
1,2-Dichloroethane	ND	ug/L		5	ND	ug/L		10
1,1-Dichloroethene	ND	ug/L		5	ND	ug/L		10
1,2-Dichloroethene (total)	ND	ug/L		5	ND	ug/L		10
1,2-Dichloropropane	ND	ug/L		5	ND	ug/L		10
cis-1,3-Dichloropropene	ND	ug/L		5	ND	ug/L		10
trans-1,3-Dichloropropene	ND	ug/L		5	ND	ug/L		10
Ethylbenzene	ND	ug/L		5	ND	ug/L		10
2-Hexanone	ND	ug/L		20	ND	ug/L		40
Methylene chloride	ND	ug/L		5	ND	ug/L		10
4-Methyl-2-pentanone	2.9	ug/L	J		ND	ug/L		40
Styrene	ND	ug/L		5	ND	ug/L		10
1,1,2,2-Tetrachloroethane	ND	ug/L		5	ND	ug/L		10
Tetrachloroethene	ND	ug/L		5	ND	ug/L		10
Toluene	ND	ug/L		5	ND	ug/L		10
1,1,1-Trichloroethane	ND	ug/L		5	ND	ug/L		10
1,1,2-Trichloroethane	ND	ug/L		5	ND	ug/L		10
Trichloroethene	ND	ug/L		5	ND	ug/L		10
Vinyl chloride	ND	ug/L		10	ND	ug/L		20
Xylenes (total)	ND	ug/L		5	ND	ug/L		10

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

SEDIMENTS	**RUN V3**					
Sample ID:	**RAW-V3-SD-01**			**CBK-V3-SD-01**		
Receiving Date	3/18/99			3/19/99		
Sample Date						
Extraction Date	3/25/99			3/25/99		
Analysis Date:	3/25/99			3/25/99		
Matrix	SOLID			SOLID		
Analyte	Result		LDL	Result		LDL
Volatile Organics						
Acetone	5.8	ug/kgJB		4.1	ug/kgJB	
Benzene	ND	ug/kg	5	ND	ug/kg	4.9
Bromodichloromethane	ND	ug/kg	5	ND	ug/kg	4.9
Bromoform	ND	ug/kg	5	ND	ug/kg	4.9
Bromomethane	ND	ug/kg	10	ND	ug/kg	9.9
2-Butanone	ND	ug/kg	20	ND	ug/kg	20
Carbon disulfide	ND	ug/kg	5	ND	ug/kg	4.9
Carbon tetrachloride	ND	ug/kg	5	ND	ug/kg	4.9
Chlorobenzene	ND	ug/kg	5	ND	ug/kg	4.9
Dibromochloromethane	ND	ug/kg	5	ND	ug/kg	4.9
Chloroethane	ND	ug/kg	10	ND	ug/kg	9.9
Chloroform	ND	ug/kg	5	ND	ug/kg	4.9
Chloromethane	ND	ug/kg	10	ND	ug/kg	9.9
1,1-Dichloroethane	ND	ug/kg	5	ND	ug/kg	4.9
1,2-Dichloroethane	ND	ug/kg	5	ND	ug/kg	4.9
1,1-Dichloroethene	ND	ug/kg	5	ND	ug/kg	4.9
1,2-Dichloroethene (total)	ND	ug/kg	5	ND	ug/kg	4.9
1,2-Dichloropropane	ND	ug/kg	5	ND	ug/kg	4.9
cis-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	4.9
trans-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	4.9
Ethylbenzene	ND	ug/kg	5	ND	ug/kg	4.9
2-Hexanone	ND	ug/kg	20	ND	ug/kg	20
Methylene chloride	ND	ug/kg	5	ND	ug/kg	4.9
4-Methyl-2-pentanone	ND	ug/kg	20	ND	ug/kg	20
Styrene	ND	ug/kg	5	ND	ug/kg	4.9
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	ND	ug/kg	4.9
Tetrachloroethene	ND	ug/kg	5	ND	ug/kg	4.9
Toluene	ND	ug/kg	5	ND	ug/kg	4.9
1,1,1-Trichloroethane	ND	ug/kg	5	ND	ug/kg	4.9
1,1,2-Trichloroethane	ND	ug/kg	5	ND	ug/kg	4.9
Trichloroethene	ND	ug/kg	5	ND	ug/kg	4.9
Vinyl chloride	ND	ug/kg	10	ND	ug/kg	9.9
Xylenes (total)	ND	ug/kg	5	ND	ug/kg	4.9

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

SOLIDS	**RUN V3**								
Sample ID:	**RAW-V3-SL-01**			**PSD-V3-SL-01**			**PAQ-V3-SL-01**		
Receiving Date	3/18/99			3/19/99			3/19/99		
Sample Date									
Extraction Date	3/24/99			3/24/99			3/24/99		
Analysis Date:	3/24/99			3/24/99			3/24/99		
Matrix	SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL
Volatile Organics									
Acetone	25	ug/kg		13	ug/kg J		97	ug/kg	
Benzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Bromodichloromethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Bromoform	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Bromomethane	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	9.9
2-Butanone	5.5	ug/kg J		3.5	ug/kg J		24	ug/kg	
Carbon disulfide	ND	ug/kg	5	ND	ug/kg	5	1.4	ug/kg J	
Carbon tetrachloride	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Chlorobenzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Dibromochloromethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Chloroethane	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	9.9
Chloroform	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Chloromethane	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	9.9
1,1-Dichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,1-Dichloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloroethene (total)	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,2-Dichloropropane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
cis-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
trans-1,3-Dichloropropene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Ethylbenzene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
2-Hexanone	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20
Methylene chloride	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
4-Methyl-2-pentanone	ND	ug/kg	20	ND	ug/kg	20	5.3	ug/kg J	
Styrene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Tetrachloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Toluene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,1,1-Trichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
1,1,2-Trichloroethane	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Trichloroethene	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5
Vinyl chloride	ND	ug/kg	10	ND	ug/kg	10	ND	ug/kg	9.9
Xylenes (total)	ND	ug/kg	5	ND	ug/kg	5	ND	ug/kg	5

Table D-3
BioGenesis Demonstration Project
Validation Test Runs
VOCs Data

AQUEOUS	**RUN V3**														
Sample ID:	**RAW-V3-AQ-01**			**PAQ-V3-AQ-01**			**PSW-V3-AQ-01**			**FBK-V3-AQ-02**			**TBK-V3-AQ-02**		
Receiving Date	3/19/99			3/19/99			3/19/99			3/19/99			3/19/99		
Sample Date															
Extraction Date	3/22/99			3/22/99			3/22/99			3/22/99			3/22/99		
Analysis Date:	3/22/99			3/22/99			3/22/99			3/22/99			3/22/99		
Matrix	WATER			WATER			WATER			WATER			WATER		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Volatile Organics															
Acetone	14	ug/L J	5.0	100	ug/L		3.5	ug/L J		5.5	ug/L J		ND		20.0
Benzene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Bromodichloromethane	ND	ug/L	5.0	ND	ug/L	5.0	5.2	ug/L		ND	ug/L	5.0	ND		5.0
Bromoform	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Bromomethane	ND	ug/L	10.0	ND	ug/L	10.0	ND	ug/L	10.0	ND	ug/L	10.0	ND		10.0
2-Butanone	3.6	ug/L J		25.0	ug/L		ND	ug/L	20.0	ND	ug/L	20.0	ND		20.0
Carbon disulfide	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	4.9	ug/L J		ND		5.0
Carbon tetrachloride	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Chlorobenzene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Dibromochloromethane	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Chloroethane	ND	ug/L	10.0	ND	ug/L	10.0	ND	ug/L	10.0	ND	ug/L	10.0	ND		10.0
Chloroform	ND	ug/L	5.0	ND	ug/L	5.0	23.0	ug/L		ND	ug/L	5.0	ND		5.0
Chloromethane	ND	ug/L	10.0	ND	ug/L	10.0	ND	ug/L	10.0	ND	ug/L	10.0	ND		10.0
1,1-Dichloroethane	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
1,2-Dichloroethane	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
1,1-Dichloroethene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
1,2-Dichloropropane	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Ethylbenzene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
2-Hexanone	ND	ug/L	20.0	ND	ug/L	20.0	ND	ug/L	20.0	ND	ug/L	20.0	ND		20.0
Methylene chloride	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
4-Methyl-2-pentanone	ND	ug/L	20.0	16.0	ug/L J		ND	ug/L	20.0	ND	ug/L	20.0	ND		20.0
Styrene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	7.4	ug/L		ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Tetrachloroethene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Toluene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
1,1,1-Trichloroethane	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
1,1,2-Trichloroethane	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Trichloroethene	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0
Vinyl chloride	ND	ug/L	10.0	ND	ug/L	10.0	ND	ug/L	10.0	ND	ug/L	10.0	ND		10.0
Xylenes (total)	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND	ug/L	5.0	ND		5.0

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

SEDIMENTS	**RUN V1**											
Sample ID:	**RAW-V1-SD-01**				**RAW-V1-SD-02**				**RAW-V1-SD-02-DUP**			
Receiving Date:	3/17/99				3/17/99				3/17/99			
Sample Date:	3/16/99				3/16/99				3/16/99			
Extraction Date:	3/19/99				3/19/99				4/2/99			
Analysis Date:	4/7/99				4/7/99				4/12/99			
Matrix:	SOLID				SOLID				SOLID			
Analyte	Result			LDL	Result			LDL	Result			LDL
PAHs												
Acenaphthene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Acenaphthylene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Anthracene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Benzo(a)anthracene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Benzo(a)pyrene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Benzo(b)fluoranthene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Benzo(k)fluoranthene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Benzo(ghi)perylene	100	ug/kg	J	330	160	ug/kg	J	330	170	ug/kg	J	310
4-Chloro-3-methylphenol	NA				ND	ug/kg		330	NA			
2-Chlorophenol	NA				ND	ug/kg		330	NA			
Chrysene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Dibenz(a,h)anthracene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Dibenzofuran	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
1,2-Dichlorobenzene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
1,3-Dichlorobenzene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
1,4-Dichlorobenzene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
2,4-Dinitrotoluene	NA				ND	ug/kg		330	NA			
Fluoranthene	ND	ug/kg		330	ND	ug/kg		330	520	ug/kg		310
Fluorene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Hexachlorobenzene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Indeno(1,2,3-cd)pyrene	100	ug/kg	J	330	170	ug/kg	J	330	210	ug/kg	J	310
2-Methlynaphthalene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
4-Nitrophenol	NA				ND	ug/kg		1600	NA			
N-Nitrosodi-n-proplamine	NA				ND	ug/kg		330	NA			
Naphthalene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Nitrobenzene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Pentachlorophenol	ND	ug/kg		1600	ND	ug/kg		1600	ND	ug/kg		1500
Phenanthrene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
Phenol	NA				ND	ug/kg		330	NA			
Pyrene	ND	ug/kg		330	ND	ug/kg		330	ND	ug/kg		310
1,2,4-Trichlorobenzene	NA				ND	ug/kg		330	NA			

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

SOLIDS	RUN V1																	
Sample ID:	**RAW-V1-SL-01**		**PPO-V1-SL-01**		**CCO-V1-SL-01**		**OXO-V1-SL-01**		**PSD-V1-SL-01**		**PSD-V1-SL-02**		**PSD-V1-SL-02-DUP**		**PAQ-V1-SL-01**	
Receiving Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/18/99	
Sample Date:	3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99	
Extraction Date:	3/19/99		3/19/99		3/19/99		3/19/99		3/19/99		3/22/99		4/2/99		3/23/99	
Analysis Date:	4/6/99		4/7/99		4/7/99		4/8/99		4/7/99		4/12/99		4/11/99		4/14/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
PAHs																		
Acenaphthene	ND ug/kg	3,300	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Phenol	NA		NA		NA		NA		NA		ND ug/kg	1,600	NA		NA	
Acenaphthylene	ND ug/kg	3,300	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Anthracene	2,700 ug/kg J	3,300	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
2-Chlorophenol	NA		NA		NA		NA		NA		ND ug/kg	1,600	NA		NA	
Benzo(a)anthracene	4,400 ug/kg	3,300	2,000 ug/kg	1,700	2,500 ug/kg	1,700	2,300 ug/kg	1,600	1,900 ug/kg	1,700	1,800 ug/kg	1,600	1,400 ug/kg J	1,600	2,600 ug/kg	1,700
Benzo(a)pyrene	4,600 ug/kg	3,300	2,000 ug/kg	1,700	2,700 ug/kg	1,700	2,500 ug/kg	1,600	2,100 ug/kg	1,700	1,900 ug/kg	1,600	1,500 ug/kg J	1,600	ND ug/kg	1,700
Benzo(b)fluoranthene	3,900 ug/kg	3,300	1,500 ug/kg J	1,700	2,700 ug/kg	1,700	2,400 ug/kg	1,600	1,800 ug/kg	1,700	1,600 ug/kg	1,600	1,200 ug/kg J	1,600	ND ug/kg	1,700
N-Nitrosodi-n-propylamine	NA		NA		NA		NA		NA		ND ug/kg	1,600	NA		NA	
Benzo(k)fluoranthene	3,400 ug/kg	3,300	1,600 ug/kg J	1,700	1,800 ug/kg	1,700	1,900 ug/kg	1,600	1,500 ug/kg J	1,700	1,500 ug/kg J	1,600	1,200 ug/kg J	1,600	ND ug/kg	1,700
1,2,4-Trichlorobenzene	NA		NA		NA		NA		NA		ND ug/kg	1,600	NA		NA	
Benzo(ghi)perylene	2,800 ug/kg J	3,300	1,100 ug/kg J	1,700	660 ug/kg J	1,700	820 ug/kg J	1,600	580 ug/kg J	1,700	1,000 ug/kg J	1,600	560 ug/kg J	1,600	ND ug/kg	1,700
4-Chloro-3-methylphenol	NA		NA		NA		NA		NA		ND ug/kg	1,600	NA		NA	
4-Nitrophenol	NA		NA		NA		NA		NA		ND ug/kg	8,000	NA		NA	
2,4-Dinitrotoluene	NA		NA		NA		NA		NA		ND ug/kg	1,600	NA		NA	
Chrysene	4,900 ug/kg	3,300	2,100 ug/kg	1,700	2,800 ug/kg	1,700	2,700 ug/kg	1,600	2,100 ug/kg	1,700	1,900 ug/kg	1,600	1,600 ug/kg	1,600	ND ug/kg	1,700
Dibenz(a,h)anthracene	680 ug/kg J	3,300	370 ug/kg J	1,700	ND ug/kg	1,700	320 ug/kg J	1,600	270 ug/kg J	1,700	300 ug/kg J	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Dibenzofuran	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
1,2-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
1,3-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
1,4-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Fluoranthene	13,000 ug/kg	3,300	3,900 ug/kg	1,700	5,100 ug/kg	1,700	4,900 ug/kg	1,600	3,700 ug/kg	1,700	3,200 ug/kg	1,600	2,700 ug/kg	1,600	3,900 ug/kg	1,700
Fluorene	ND ug/kg	3,300	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Hexachlorobenzene	ND ug/kg	3,300	ND ug/kg	3,300	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Indeno(1,2,3-cd)pyrene	2,900 ug/kg J	3,300	1,100 ug/kg J	1,700	1,100 ug/kg J	1,700	880 ug/kg J	1,600	930 ug/kg J	1,700	1,000 ug/kg J	1,600	1,100 ug/kg J	1,600	ND ug/kg	1,700
2-Methlynaphthalene	ND ug/kg	3,300	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Naphthalene	ND ug/kg	3,300	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Nitrobenzene	ND ug/kg	3,300	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,700	ND ug/kg	1,600	ND ug/kg	1,600	ND ug/kg	1,700
Pentachlorophenol	ND ug/kg	16,000	ND ug/kg	8,000	ND ug/kg	8,000	ND ug/kg	8,000	ND ug/kg	8,000	ND ug/kg	8,000	ND ug/kg	8,000	ND ug/kg	8,100
Phenanthrene	13,000 ug/kg	3,300	1,400 ug/kg J	1,700	1,600 ug/kg J	1,700	1,600 ug/kg	1,600	1,300 ug/kg J	1,700	1,200 ug/kg J	1,600	1,200 ug/kg J	1,600	ND ug/kg	1,700
Pyrene	9,000 ug/kg	3,300	2,600 ug/kg	1,700	3,500 ug/kg	1,700	3,100 ug/kg	1,600	2,800 ug/kg	1,700	2,300 ug/kg	1,600	2,200 ug/kg	1,600	ND ug/kg	1,700

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

AQUEOUS	**RUN V1**											
Sample ID:	**RAW-V1-AQ-01**			**PPO-V1-AQ-01**			**CCO-V1-AQ-01**			**OXO-V1-AQ-01**		
Receiving Date:	3/17/99			3/17/99			3/17/99			3/17/99		
Sample Date:	3/16/99			3/16/99			3/16/99			3/16/99		
Extraction Date:	3/18/99			3/18/99			3/18/99			3/18/99		
Analysis Date:	4/12/99			4/12/99			4/11/99			4/11/99		
Matrix:	WATER			WATER			WATER			WATER		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL
PAHs												
Naphthalene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
Phenol	NA			NA			NA			NA		
Acenaphthylene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
Acenaphthene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
2-Chlorophenol	NA			NA			NA			NA		
Fluorene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
1,4-Dichlorobenzene	NA			NA			NA			NA		
Phenanthrene	3.5 ug/L	J	20	ND ug/L		20	ND ug/L		40	7.2 ug/L	J	40
Anthracene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
N-Nitrosodi-n-propylamine	NA			NA			NA			NA		
Fluoranthene	6.8 ug/L	J	20	ND ug/L		20	ND ug/L		40	ND ug/L		40
1,2,4-Trichlorobenzene	NA			NA			NA			NA		
Pyrene	4.4 ug/L	J	20	ND ug/L		20	ND ug/L		40	ND ug/L		40
Benzo(a)anthracene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
4-Chloro-3-methylphenol	NA			NA			NA			NA		
Chrysene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
Benzo(b)fluoranthene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
Benzo(k)fluoranthene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
4-Nitrophenol	NA			NA			NA			NA		
Benzo(a)pyrene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
2,4-Dinitrotoluene	NA			NA			NA			NA		
Indeno(1,2,3-cd)pyrene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
Pentachlorophenol	NA			NA			NA			NA		
Dibenz(a,h)anthracene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40
Benzo(ghi)perylene	ND ug/L		20	ND ug/L		20	ND ug/L		40	ND ug/L		40

Sample ID:	**PAQ-V1-AQ-01**			**PAQ-V1-AQ-02**		
Receiving Date:	3/18/99			3/18/99		
Sample Date:	3/16/99			3/16/99		
Extraction Date:	3/22/99			3/22/99		
Analysis Date:	4/5/99			4/5/99		
Matrix:	WATER			WATER		
Analyte	Result		LDL	Result		LDL
PAHs						
Naphthalene	ND ug/L		10	ND ug/L		10
Phenol	NA			ND ug/L		10
Acenaphthylene	ND ug/L		10	ND ug/L		10
Acenaphthene	ND ug/L		10	ND ug/L		10
2-Chlorophenol	NA			ND ug/L		10
Fluorene	ND ug/L		10	ND ug/L		10
1,4-Dichlorobenzene	NA			ND ug/L		10
Phenanthrene	ND ug/L		10	1.1 ug/L	J	10
Anthracene	ND ug/L		10	ND ug/L		10
N-Nitrosodi-n-propylamine	NA			ND ug/L		10
Fluoranthene	ND ug/L		10	1.4 ug/L	J	10
1,2,4-Trichlorobenzene	NA			ND ug/L		10
Pyrene	1.5 ug/L	J	10	4.7 ug/L	J	10
Benzo(a)anthracene	ND ug/L		10	ND ug/L		10
4-Chloro-3-methylphenol	NA			ND ug/L		10
Chrysene	ND ug/L		10	ND ug/L		10
Benzo(b)fluoranthene	ND ug/L		10	ND ug/L		10
Benzo(k)fluoranthene	ND ug/L		10	ND ug/L		10
4-Nitrophenol	NA			ND ug/L		50
Benzo(a)pyrene	ND ug/L		10	ND ug/L		10
2,4-Dinitrotoluene	NA			ND ug/L		10
Indeno(1,2,3-cd)pyrene	ND ug/L		10	ND ug/L		10
Pentachlorophenol	NA			ND ug/L		50
Dibenz(a,h)anthracene	ND ug/L		10	ND ug/L		10
Benzo(ghi)perylene	ND ug/L		10	ND ug/L		10

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

SEDIMENTS	**RUN V2**		
Sample ID:	**RAW-V2-SD-01**		
Receiving Date:	3/18/99		
Sample Date:	3/16/99		
Extraction Date:	3/23/99		
Analysis Date:	4/11/99		
Matrix:	SOLID		
Analyte	Result		LDL
PAHs			
Acenaphthene	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Benzo(a)anthracene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(ghi)perylene	ND	ug/kg	330
4-Chloro-3-methylphenol	NA		
2-Chlorophenol	NA		
Chrysene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Dibenzofuran	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
2,4-Dinitrotoluene	NA		
Fluoranthene	ND	ug/kg	330
Fluorene	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
2-Methlynaphthalene	ND	ug/kg	330
4-Nitrophenol	NA		
N-Nitrosodi-n-proplamine	NA		
Naphthalene	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Phenol	NA		
Pyrene	ND	ug/kg	330
1,2,4-Trichlorobenzene	NA		

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

SOLIDS	**RUN V2**											
Sample ID:	**RAW-V2-SL-01**		**PPO-V2-SL-01**		**CCO-V2-SL-01**		**OXO-V2-SL-01**		**PSD-V2-SL-01**		**PAQ-V2-SL-01**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Sample Date:	3/16/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99	
Extraction Date:	3/23/99		3/24/99		3/24/99		3/24/99		3/24/99		3/24/99	
Analysis Date:	4/14/99		4/9/99		4/9/99		4/9/99		4/9/99		4/9/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
PAHs												
Acenaphthene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Phenol	NA		NA		NA		NA		NA		NA	
Acenaphthylene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Anthracene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
2-Chlorophenol	NA		NA		NA		NA		NA		NA	
Benzo(a)anthracene	1,600 ug/kg J	1,700	1,500 ug/kg J	1,700	1,700 ug/kg	1,700	1,300 ug/kg J	1,700	1,500 ug/kg J	1,700	ND ug/kg	1,700
Benzo(a)pyrene	1,500 ug/kg J	1,700	1,100 ug/kg J	1,700	1,800 ug/kg	1,700	1,100 ug/kg J	1,700	1,400 ug/kg J	1,700	ND ug/kg	1,700
Benzo(b)fluoranthene	1,400 ug/kg J	1,700	1,100 ug/kg J	1,700	1,500 ug/kg J	1,700	990 ug/kg J	1,700	1,200 ug/kg J	1,700	ND ug/kg	1,700
N-Nitrosodi-n-propylamine	NA		NA		NA		NA		NA		NA	
Benzo(k)fluoranthene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	1,200 ug/kg J	1,700	ND ug/kg	1,700
1,2,4-Trichlorobenzene	NA		NA		NA		NA		NA		NA	
Benzo(ghi)perylene	810 ug/kg J	1,700	950 ug/kg J	1,700	1,200 ug/kg J	1,700	940 ug/kg J	1,700	1,100 ug/kg J	1,700	ND ug/kg	1,700
4-Chloro-3-methylphenol	NA		NA		NA		NA		NA		NA	
4-Nitrophenol	NA		NA		NA		NA		NA		NA	
2,4-Dinitrotoluene	NA		NA		NA		NA		NA		NA	
Chrysene	1,900 ug/kg	1,700	1,800 ug/kg	1,700	2,300 ug/kg	1,700	1,500 ug/kg J	1,700	1,700 ug/kg J	1,700	ND ug/kg	1,700
Dibenz(a,h)anthracene	370 ug/kg J	1,700	ND ug/kg	1,700	360 ug/kg J	1,700	ND ug/kg	1,700	280 ug/kg J	1,700	ND ug/kg	1,700
Dibenzofuran	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
1,2-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
1,3-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
1,4-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Fluoranthene	3,400 ug/kg	1,700	3,000 ug/kg	1,700	3,600 ug/kg	1,700	2,500 ug/kg	1,700	2,500 ug/kg	1,700	4,100 ug/kg	1,700
Fluorene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Hexachlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Indeno(1,2,3-cd)pyrene	1,200 ug/kg J	1,700	990 ug/kg J	1,700	1,100 ug/kg J	1,700	950 ug/kg J	1,700	1,000 ug/kg J	1,700	ND ug/kg	1,700
2-Methlynaphthalene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Naphthalene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Nitrobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Pentachlorophenol	ND ug/kg	8,200	ND ug/kg	8,100	ND ug/kg	8,100	ND ug/kg	1,700	ND ug/kg	8,100	ND ug/kg	8,100
Phenanthrene	1,400 ug/kg J	1,700	1,300 ug/kg J	1,700	ND ug/kg	1,700	ND ug/kg	1,700	1,100 ug/kg J	1,700	ND ug/kg	1,700
Pyrene	2,600 ug/kg	1,700	2,400 ug/kg	1,700	2,600 ug/kg	1,700	2,100 ug/kg	1,700	2,200 ug/kg	1,700	ND ug/kg	1,700

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

AQUEOUS	**RUN V2**											
Sample ID:	**RAW-V2-AQ-01**			**PPO-V2-AQ-01**			**CCO-V2-AQ-01**			**OXO-V2-AQ-01**		
Receiving Date:	3/18/99			3/18/99			3/18/99			3/18/99		
Sample Date:	3/16/99			3/17/99			3/17/99			3/17/99		
Extraction Date:	3/22/99			3/22/99			3/22/99			3/22/99		
Analysis Date:	4/5/99			4/5/99			4/5/99			4/5/99		
Matrix:	WATER			WATER			WATER			WATER		
Analyte	Results		LDL	Results		LDL	Results		LDL	Results		LDL
PAHs												
Naphthalene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Phenol	NA			NA			NA			NA		
Acenaphthylene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Acenaphthene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
2-Chlorophenol	NA			NA			NA			NA		
Fluorene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
1,4-Dichlorobenzene	NA			NA			NA			NA		
Phenanthrene	1.5 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Anthracene	1.2 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10
N-Nitrosodi-n-propylamine	NA			NA			NA			NA		
Fluoranthene	2.5 ug/L	J	10	ND ug/L		10	ND ug/L		10	1.3 ug/L	J	10
1,2,4-Trichlorobenzene	NA			NA			NA			NA		
Pyrene	2.8 ug/L	J	10	3 ug/L	J	10	2.2 ug/L	J	10	4.5 ug/L	J	10
Benzo(a)anthracene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
4-Chloro-3-methylphenol	NA			NA			NA			NA		
Chrysene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Benzo(b)fluoranthene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Benzo(k)fluoranthene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
4-Nitrophenol	NA			NA			NA			NA		
Benzo(a)pyrene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
2,4-Dinitrotoluene	NA			NA			NA			NA		
Indeno(1,2,3-cd)pyrene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Pentachlorophenol	NA			NA			NA			NA		
Dibenz(a,h)anthracene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Benzo(ghi)perylene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10

Sample ID:	**PAQ-V2-AQ-01**			**PAQ-V2-AQ-01-DUP**		
Receiving Date:	3/18/99			3/18/99		
Sample Date:	3/17/99			3/17/99		
Extraction Date:	3/22/99			3/22/99		
Analysis Date:	4/5/99			4/6/99		
Matrix:	WATER			WATER		
Analyte	Results		LDL	Results		LDL
PAHs						
Naphthalene	ND ug/L		10	ND ug/L		10
Phenol	NA			NA		
Acenaphthylene	ND ug/L		10	ND ug/L		10
Acenaphthene	ND ug/L		10	ND ug/L		10
2-Chlorophenol	NA			NA		
Fluorene	ND ug/L		10	ND ug/L		10
1,4-Dichlorobenzene	NA			NA		
Phenanthrene	ND ug/L		10	ND ug/L		10
Anthracene	ND ug/L		10	ND ug/L		10
N-Nitrosodi-n-propylamine	NA			NA		
Fluoranthene	1.2 ug/L	J	10	1.3 ug/L	J	10
1,2,4-Trichlorobenzene	NA			NA		
Pyrene	1.3 ug/L	J	10	3.9 ug/L	J	10
Benzo(a)anthracene	ND ug/L		10	ND ug/L		10
4-Chloro-3-methylphenol	NA			NA		
Chrysene	ND ug/L		10	ND ug/L		10
Benzo(b)fluoranthene	ND ug/L		10	ND ug/L		10
Benzo(k)fluoranthene	ND ug/L		10	ND ug/L		10
4-Nitrophenol	NA			NA		
Benzo(a)pyrene	ND ug/L		10	ND ug/L		10
2,4-Dinitrotoluene	NA			NA		
Indeno(1,2,3-cd)pyrene	ND ug/L		10	ND ug/L		10
Pentachlorophenol	NA			NA		
Dibenz(a,h)anthracene	ND ug/L		10	ND ug/L		10
Benzo(ghi)perylene	ND ug/L		10	ND ug/L		10

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

SEDIMENTS	**RUN V3**					
Sample ID:	**RAW-V3-SD-01**			**CBK-V3-SD-01**		
Receiving Date:	3/18/99			3/19/99		
Sample Date:	3/17/99					
Extraction Date:	3/24/99			3/24/99		
Analysis Date:	4/6/99			4/6/99		
Matrix:	SOLID			SOLID		
Analyte	Results		LDL	Results		LDL
PAHs						
Acenaphthene	ND	ug/kg	330	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330	ND	ug/kg	330
Anthracene	ND	ug/kg	330	ND	ug/kg	330
Benzo(a)anthracene	ND	ug/kg	330	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330	ND	ug/kg	330
Benzo(ghi)perylene	160	ug/kg J	330	ND	ug/kg	330
4-Chloro-3-methylphenol	NA			NA		
2-Chlorophenol	NA			NA		
Chrysene	ND	ug/kg	330	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330	ND	ug/kg	330
Dibenzofuran	ND	ug/kg	330	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330	ND	ug/kg	330
2,4-Dinitrotoluene	NA			NA		
Fluoranthene	ND	ug/kg	330	ND	ug/kg	330
Fluorene	ND	ug/kg	330	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	140	ug/kg J	330	ND	ug/kg	330
2-Methlynaphthalene	ND	ug/kg	330	ND	ug/kg	330
4-Nitrophenol	NA			NA		
N-Nitrosodi-n-proplamine	NA			NA		
Naphthalene	ND	ug/kg	330	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330	ND	ug/kg	330
Phenol	NA			NA		
Pyrene	ND	ug/kg	330	ND	ug/kg	330
1,2,4-Trichlorobenzene	NA			NA		

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

SOLIDS	RUN V3											
Sample ID:	**RAW-V3-SL-01**		**PPO-V3-SL-01**		**CCO-V3-SL-01**		**OXO-V3-SL-01**		**PSD-V3-SL-01**		**PAQ-V3-SL-01**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/19/99		3/19/99	
Sample Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99	
Extraction Date:	3/24/99		3/24/99		3/24/99		3/24/99		3/24/99		3/24/99	
Analysis Date:	4/9/99		4/9/99		4/10/99		4/10/99		4/11/99		4/11/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL
PAHs												
Acenaphthene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Phenol	NA		NA		NA		NA		NA		NA	
Acenaphthylene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Anthracene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
2-Chlorophenol	NA		NA		NA		NA		NA		NA	
Benzo(a)anthracene	1,300 ug/kg J	1,700	1,400 ug/kg J	1,700	1,400 ug/kg J	1,700	1,700 ug/kg	1,700	1,400 ug/kg J	1,700	ND ug/kg	1,700
Benzo(a)pyrene	1,200 ug/kg J	1,700	1,300 ug/kg J	1,700	1,300 ug/kg J	1,700	1,700 ug/kg	1,700	1,400 ug/kg J	1,700	ND ug/kg	1,700
Benzo(b)fluoranthene	1,100 ug/kg J	1,700	1,100 ug/kg J	1,700	1,000 ug/kg J	1,700	1,400 ug/kg J	1,700	1,200 ug/kg J	1,700	ND ug/kg	1,700
N-Nitrosodi-n-propylamine	NA		NA		NA		NA		NA		NA	
Benzo(k)fluoranthene	ND ug/kg	1,700	1,100 ug/kg J	1,700	1,100 ug/kg J	1,700	1,200 ug/kg J	1,700	1,100 ug/kg J	1,700	ND ug/kg	1,700
1,2,4-Trichlorobenzene	NA		NA		NA		NA		NA		NA	
Benzo(ghi)perylene	980 ug/kg J	1,700	1,000 ug/kg J	1,700	930 ug/kg J	1,700	1,100 ug/kg J	1,700	1,100 ug/kg J	1,700	ND ug/kg	1,700
4-Chloro-3-methylphenol	NA		NA		NA		NA		NA		NA	
4-Nitrophenol	NA		NA		NA		NA		NA		NA	
2,4-Dinitrotoluene	NA		NA		NA		NA		NA		NA	
Chrysene	1,500 ug/kg J	1,700	1,600 ug/kg J	1,700	1,500 ug/kg J	1,700	2,000 ug/kg	1,700	1,500 ug/kg J	1,700	ND ug/kg	1,700
Dibenz(a,h)anthracene	ND ug/kg	1,700	260 ug/kg J	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Dibenzofuran	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
1,2-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
1,3-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
1,4-Dichlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Fluoranthene	3,100 ug/kg	1,700	2,900 ug/kg	1,700	2,700 ug/kg	1,700	3,400 ug/kg	1,700	2,600 ug/kg	1,700	3,000 ug/kg	1,700
Fluorene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Hexachlorobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Indeno(1,2,3-cd)pyrene	940 ug/kg J	1,700	940 ug/kg J	1,700	850 ug/kg J	1,700	1,100 ug/kg J	1,700	1,000 ug/kg J	1,700	ND ug/kg	1,700
2-Methlynaphthalene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Naphthalene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Nitrobenzene	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700	ND ug/kg	1,700
Pentachlorophenol	ND ug/kg	8,100	ND ug/kg	8,100	ND ug/kg	8,100	ND ug/kg	8,100	ND ug/kg	8,100	ND ug/kg	8,100
Phenanthrene	1,200 ug/kg J	1,700	1,100 ug/kg J	1,700	1,100 ug/kg J	1,700	1,300 ug/kg J	1,700	1,100 ug/kg J	1,700	ND ug/kg	1,700
Pyrene	2,200 ug/kg	1,700	2,200 ug/kg	1,700	2,200 ug/kg	1,700	2,600 ug/kg	1,700	2,200 ug/kg	1,700	ND ug/kg	1,700

Table D-4
BioGenesis Demonstration Project
Validation Test Runs
PAHs Data

AQUEOUS	**RUN V3**															
Sample ID:	**RAW-V3-AQ-01**			**PPO-V3-AQ-01**			**CCO-V3-AQ-01**			**OXO-V3-AQ-01**			**PAQ-V3-AQ-01**			**PSW-V3-AQ-01**			**FBK-V3-AQ-02**		
Receiving Date:	3/19/99			3/18/99			3/18/99			3/18/99			3/19/99			3/19/99			3/19/99		
Sample Date:	3/17/99			3/16/99			3/17/99			3/17/99			3/16/99								
Extraction Date:	3/22/99			3/22/99			3/22/99			3/22/99			3/22/99			3/22/99			3/22/99		
Analysis Date:	4/6/99			4/5/99			4/5/99			4/6/99			4/6/99			4/6/99			4/6/99		
Matrix:	WATER			WATER			WATER			WATER			WATER			WATER			WATER		
Analyte	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL	Results		LDL
PAHs																					
Naphthalene	3.1 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Phenol	NA			NA			NA			NA			NA			NA			NA		
Acenaphthylene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Acenaphthene	1.8 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
2-Chlorophenol	NA			NA			NA			NA			NA			NA			NA		
Fluorene	1.4 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
1,4-Dichlorobenzene	NA			NA			NA			NA			NA			NA			NA		
Phenanthrene	3.8 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Anthracene	2.4 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	3.5 ug/L	J	10	ND ug/L		10	ND ug/L		10
N-Nitrosodi-n-propylamine	NA			NA			NA			NA			NA			NA			NA		
Fluoranthene	7 ug/L	J	10	0.95 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
1,2,4-Trichlorobenzene	NA			NA			NA			NA			NA			NA			NA		
Pyrene	4.9 ug/L	J	10	4.8 ug/L	J	10	4 ug/L	J	10	3.8 ug/L	J	10	3.3 ug/L	J	10	ND ug/L		10	ND ug/L		10
Benzo(a)anthracene	1.9 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
4-Chloro-3-methylphenol	NA			NA			NA			NA			NA			NA			NA		
Chrysene	2.3 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Benzo(b)fluoranthene	1.1 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Benzo(k)fluoranthene	1.4 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
4-Nitrophenol	NA			NA			NA			NA			NA			NA			NA		
Benzo(a)pyrene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
2,4-Dinitrotoluene	NA			NA			NA			NA			NA			NA			NA		
Indeno(1,2,3-cd)pyrene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Pentachlorophenol	NA			NA			NA			NA			NA			NA			NA		
Dibenz(a,h)anthracene	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10
Benzo(ghi)perylene	1.2 ug/L	J	10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10	ND ug/L		10

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

SEDIMENTS	**RUN V1**								
Sample ID:	**RAW-V1-SD-01**			**RAW-V1-SD-02**			**RAW-V1-SD-02-DUP**		
Receiving Date	3/17/99			3/17/99			3/17/99		
Sample Date									
Extraction Date	3/22/99			3/22/99			3/31/99		
Analysis Date:	3/30/99			3/30/99			4/13/99		
Matrix	SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL
Herbicides									
2,4-D	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	19
2,4,5-TP (Silvex)	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	38
2,4,5-T	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	38
SEDIMENTS	**RUN V1**								
Sample ID:	**RAW-V1-SD-01**			**RAW-V1-SD-02**			**RAW-V1-SD-02-DUP**		
Receiving Date	3/17/99			3/17/99			3/17/99		
Sample Date									
Extraction Date	3/22/99			3/22/99			4/2/99		
Analysis Date:	4/8/99			4/8/99			4/9/99		
Matrix	SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL
Pesticides									
alpha-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
beta-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
delta-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
gamma-BHC (Lindane)	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
Heptachlor	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
Aldrin	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
Heptachlor expoxide	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
Endosulfan I	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
Dieldrin	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
4,4' - DDE	3.7	ug/kg		2.5	ug/kg		4.5	ug/kg	
Endrin	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
Endrin ketone	1.7	ug/kg		ND	ug/kg	1.7	ND	ug/kg	2.0
Endrin aldehyde	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
Endosulfan II	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
4,4' - DDD	2.2	ug/kg		ND	ug/kg	1.7	2.3	ug/kg	
Endosulfan sulfate	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
4,4' - DDT	4.0	ug/kg		ND	ug/kg	1.7	ND	ug/kg	2.0
Methoxychlor	ND	ug/kg	17	ND	ug/kg	17	ND	ug/kg	20
alpha-Chlordane	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
gamma-Chlordane	ND	ug/kg	1.7	ND	ug/kg	1.7	ND	ug/kg	2.0
Toxaphene	ND	ug/kg	67	ND	ug/kg	67	ND	ug/kg	79

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

SOLIDS	**RUN V1**														
Sample ID:	**RAW-V1-SL-01**			**PSD-V1-SL-01**			**PSD-V1-SL-02**			**PSD-V1-SL-02 DUP**			**PAQ-V1-SL-01**		
Receiving Date	3/17/99			3/17/99			3/17/99			3/17/99			3/18/99		
Sample Date															
Extraction Date	3/22/99			3/22/99			3/22/99			3/30/99			3/22/99		
Analysis Date:	4/9/99			4/9/99			4/9/99			4/8/99			4/9/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Herbicides															
2,4-D	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20
2,4,5-TP (Silvex)	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40
2,4,5-T	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40
SOLIDS	**RUN V1**														
Sample ID:	**RAW-V1-SL-01**			**PSD-V1-SL-01**			**PSD-V1-SL-02**			**PSD-V1-SL-02 DUP**			**PAQ-V1-SL-01**		
Receiving Date	3/17/99			3/17/99			3/17/99			3/17/99			3/18/99		
Sample Date															
Extraction Date	3/22/99			3/22/99			3/22/99			3/23/99			3/23/99		
Analysis Date:	4/12/99			4/12/99			4/12/99			4/1/99			4/1/99		
Matrix	SOLID			SOLID			SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Pesticides															
alpha-BHC	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
beta-BHC	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	9.4	ug/kg		ND	ug/kg	19
delta-BHC	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
gamma-BHC (Lindane)	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
Heptachlor	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
Aldrin	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	8.5	ug/kg		ND	ug/kg	19
Heptachlor expoxide	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
Endosulfan I	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
Dieldrin	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
4,4' - DDE	26	ug/kg		18	ug/kg		18	ug/kg		24	ug/kg		57	ug/kg	
Endrin	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
Endrin ketone	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
Endrin aldehyde	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
Endosulfan II	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
4,4' - DDD	17	ug/kg		13	ug/kg		14	ug/kg		15	ug/kg		ND	ug/kg	19
Endosulfan sulfate	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
4,4' - DDT	ND	ug/kg	3.4	8.1	ug/kg		13	ug/kg		27	ug/kg		ND	ug/kg	19
Methoxychlor	ND	ug/kg	34	ND	ug/kg	34	ND	ug/kg	34	ND	ug/kg	85	ND	ug/kg	190
alpha-Chlordane	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
gamma-Chlordane	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	3.4	ND	ug/kg	8.5	ND	ug/kg	19
Toxaphene	ND	ug/kg	130	ND	ug/kg	130	ND	ug/kg	130	ND	ug/kg	330	ND	ug/kg	76

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

AQUEOUS	**RUN V1**								
Sample ID:	**RAW-V1-AQ-01**			**PAQ-V1-AQ-01**			**PAQ-V1-AQ-02**		
Receiving Date	3/17/99			3/18/99			3/18/99		
Sample Date									
Extraction Date	3/19/99			3/19/99			3/19/99		
Analysis Date:	3/31/99			3/31/99			3/31/99		
Matrix	WATER			WATER			WATER		
Analyte	Result		LDL	Result		LDL	Result		LDL
Herbicides									
2,4-D	ND	ug/L	4.0	ND	ug/L	4.0	ND	ug/L	4.0
2,4,5-TP (Silvex)	ND	ug/L	1.0	ND	ug/L	1.0	ND	ug/L	1.0
2,4,5-T	ND	ug/L	1.0	ND	ug/L	1.0	ND	ug/L	1.0

AQUEOUS	**RUN V1**											
Sample ID:	**RAW-V1-AQ-01**			**PAQ-V1-AQ-01**			**PAQ-V1-AQ-02**			**PAQ-V1-AQ-02-DUP**		
Receiving Date	3/17/99			3/18/99			3/18/99			3/18/99		
Sample Date												
Extraction Date	3/19/99			3/19/99			3/19/99			3/19/99		
Analysis Date:	4/7/99			4/6/99			4/6/99			4/7/99		
Matrix	WATER			WATER			WATER			WATER		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Pesticides												
alpha-BHC	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
beta-BHC	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
delta-BHC	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
gamma-BHC (Lindane)	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Heptachlor	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Aldrin	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Heptachlor expoxide	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Endosulfan I	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Dieldrin	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
4,4' - DDE	0.14	ug/L		ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Endrin	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Endrin ketone	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Endrin aldehyde	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Endosulfan II	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
4,4' - DDD	0.065	ug/L		ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Endosulfan sulfate	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
4,4' - DDT	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Methoxychlor	ND	ug/L	0.50	ND	ug/L	0.50	ND	ug/L	0.50	ND	ug/L	0.50
alpha-Chlordane	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
gamma-Chlordane	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050	ND	ug/L	0.050
Toxaphene	ND	ug/L	2.0	ND	ug/L	2.0	ND	ug/L	2.0	ND	ug/L	2.0

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

SEDIMENTS	**RUN V2**		
Sample ID:	**RAW-V2-SD-01**		
Receiving Date	3/18/99		
Sample Date			
Extraction Date	3/22/99		
Analysis Date:	3/30/99		
Matrix	SOLID		
Analyte	Result		LDL
Herbicides			
2,4-D	ND	ug/kg	20
2,4,5-TP (Silvex)	ND	ug/kg	40
2,4,5-T	ND	ug/kg	40

SEDIMENTS	**RUN V2**		
Sample ID:	**RAW-V2-SD-01**		
Receiving Date	3/18/99		
Sample Date			
Extraction Date	3/22/99		
Analysis Date:	4/8/99		
Matrix	SOLID		
Analyte	Result		LDL
Pesticides			
alpha-BHC	ND	ug/kg	1.7
beta-BHC	ND	ug/kg	1.7
delta-BHC	ND	ug/kg	1.7
gamma-BHC (Lindane)	ND	ug/kg	1.7
Heptachlor	ND	ug/kg	1.7
Aldrin	ND	ug/kg	1.7
Heptachlor expoxide	ND	ug/kg	1.7
Endosulfan I	ND	ug/kg	1.7
Dieldrin	ND	ug/kg	1.7
4,4' - DDE	4.0	ug/kg	
Endrin	ND	ug/kg	1.7
Endrin ketone	ND	ug/kg	1.7
Endrin aldehyde	ND	ug/kg	1.7
Endosulfan II	ND	ug/kg	1.7
4,4' - DDD	5.5	ug/kg	
Endosulfan sulfate	ND	ug/kg	1.7
4,4' - DDT	2.0	ug/kg	
Methoxychlor	ND	ug/kg	17
alpha-Chlordane	ND	ug/kg	1.7
gamma-Chlordane	ND	ug/kg	1.7
Toxaphene	ND	ug/kg	67

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

SOLIDS	**RUN V2**								
Sample ID:	**RAW-V2-SL-01**			**PSD-V2-SL-01**			**PAQ-V2-SL-01**		
Receiving Date	3/18/99			3/18/99			3/18/99		
Sample Date									
Extraction Date	3/22/99			3/22/99			3/22/99		
Analysis Date:	4/9/99			4/9/99			4/9/99		
Matrix	SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL
Herbicides									
2,4-D	ND	ug/kg	20	ND	ug/kg	20	ND	ug/kg	20
2,4,5-TP (Silvex)	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40
2,4,5-T	ND	ug/kg	40	ND	ug/kg	40	ND	ug/kg	40
SOLIDS	**RUN V2**								
Sample ID:	**RAW-V2-SL-01**			**PSD-V2-SL-01**			**PAQ-V2-SL-01**		
Receiving Date	3/18/99			3/18/99			3/18/99		
Sample Date									
Extraction Date	3/23/99			3/23/99			3/23/99		
Analysis Date:	4/6/99			4/6/99			4/6/99		
Matrix	SOLID			SOLID			SOLID		
Analyte	Result		LDL	Result		LDL	Result		LDL
Pesticides									
alpha-BHC	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
beta-BHC	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
delta-BHC	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
gamma-BHC (Lindane)	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Heptachlor	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Aldrin	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Heptachlor expoxide	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Endosulfan I	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Dieldrin	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
4,4' - DDE	54	ug/kg		22	ug/kg		93	ug/kg	
Endrin	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Endrin ketone	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Endrin aldehyde	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Endosulfan II	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
4,4' - DDD	32	ug/kg		18	ug/kg		49	ug/kg	
Endosulfan sulfate	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
4,4' - DDT	ND	ug/kg	8.5	13	ug/kg		ND	ug/kg	17
Methoxychlor	ND	ug/kg	85	ND	ug/kg	34	ND	ug/kg	170
alpha-Chlordane	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
gamma-Chlordane	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Toxaphene	ND	ug/kg	340	ND	ug/kg	140	ND	ug/kg	670

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

AQUEOUS	**RUN V2**								
Sample ID:	**RAW-V2-AQ-01**			**PAQ-V2-AQ-01**			**PAQ-V1-AQ-02-DUP**		
Receiving Date	3/18/99			3/18/99			3/18/99		
Sample Date									
Extraction Date	3/19/99			3/19/99			3/19/99		
Analysis Date:	3/31/99			3/31/99			3/31/99		
Matrix	WATER			WATER			WATER		
Analyte	Result		LDL	Result		LDL	Result		LDL
Herbicides									
2,4-D	ND	ug/L	4.0	ND	ug/L	4.0	ND	ug/L	4.0
2,4,5-TP (Silvex)	ND	ug/L	1.0	ND	ug/L	1.0	ND	ug/L	1.0
2,4,5-T	ND	ug/L	1.0	ND	ug/L	1.0	ND	ug/L	1.0

AQUEOUS	**RUN V2**					
Sample ID:	**RAW-V2-AQ-01**			**PAQ-V2-AQ-01**		
Receiving Date	3/18/99			3/18/99		
Sample Date						
Extraction Date	3/19/99			3/19/99		
Analysis Date:	4/7/99			4/7/99		
Matrix	WATER			WATER		
Analyte	Result		LDL	Result		LDL
Pesticides						
alpha-BHC	ND	ug/L	0.050	ND	ug/L	0.050
beta-BHC	ND	ug/L	0.050	ND	ug/L	0.050
delta-BHC	ND	ug/L	0.050	ND	ug/L	0.050
gamma-BHC (Lindane)	ND	ug/L	0.050	ND	ug/L	0.050
Heptachlor	ND	ug/L	0.050	ND	ug/L	0.050
Aldrin	ND	ug/L	0.050	ND	ug/L	0.050
Heptachlor expoxide	ND	ug/L	0.050	ND	ug/L	0.050
Endosulfan I	ND	ug/L	0.050	ND	ug/L	0.050
Dieldrin	ND	ug/L	0.050	ND	ug/L	0.050
4,4' - DDE	0.13	ug/L		ND	ug/L	0.050
Endrin	ND	ug/L	0.050	ND	ug/L	0.050
Endrin ketone	ND	ug/L	0.050	ND	ug/L	0.050
Endrin aldehyde	ND	ug/L	0.050	ND	ug/L	0.050
Endosulfan II	ND	ug/L	0.050	ND	ug/L	0.050
4,4' - DDD	0.055	ug/L		ND	ug/L	0.050
Endosulfan sulfate	ND	ug/L	0.050	ND	ug/L	0.050
4,4' - DDT	ND	ug/L	0.050	ND	ug/L	0.050
Methoxychlor	ND	ug/L	0.50	ND	ug/L	0.50
alpha-Chlordane	ND	ug/L	0.050	ND	ug/L	0.050
gamma-Chlordane	ND	ug/L	0.050	ND	ug/L	0.050
Toxaphene	ND	ug/L	2.0	ND	ug/L	2.0

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

SEDIMENTS	**RUN V3**					
Sample ID:	**RAW-V3-SD-01**			**CBK-V3-SD-01**		
Receiving Date	3/18/99			3/19/99		
Sample Date						
Extraction Date	3/22/99			3/24/99		
Analysis Date:	3/30/99			4/8/99		
Matrix	SOLID			SOLID		
Analyte	Result		LDL	Result		LDL
Herbicides						
2,4-D	ND	ug/kg	20	ND	ug/kg	20
2,4,5-TP (Silvex)	ND	ug/kg	40	ND	ug/kg	40
2,4,5-T	ND	ug/kg	40	ND	ug/kg	40
SEDIMENTS	**RUN V3**					
Sample ID:	**RAW-V3-SD-01**			**CBK-V3-SD-01**		
Receiving Date	3/18/99			3/19/99		
Sample Date						
Extraction Date	3/22/99			3/24/99		
Analysis Date:	4/8/99			4/9/99		
Matrix	SOLID			SOLID		
Analyte	Result		LDL	Result		LDL
Pesticides						
alpha-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7
beta-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7
delta-BHC	ND	ug/kg	1.7	ND	ug/kg	1.7
gamma-BHC (Lindane)	ND	ug/kg	1.7	ND	ug/kg	1.7
Heptachlor	ND	ug/kg	1.7	ND	ug/kg	1.7
Aldrin	ND	ug/kg	1.7	ND	ug/kg	1.7
Heptachlor expoxide	ND	ug/kg	1.7	ND	ug/kg	1.7
Endosulfan I	ND	ug/kg	1.7	ND	ug/kg	1.7
Dieldrin	ND	ug/kg	1.7	ND	ug/kg	1.7
4,4' - DDE	2.2	ug/kg		ND	ug/kg	1.7
Endrin	ND	ug/kg	1.7	ND	ug/kg	1.7
Endrin ketone	ND	ug/kg	1.7	ND	ug/kg	1.7
Endrin aldehyde	ND	ug/kg	1.7	ND	ug/kg	1.7
Endosulfan II	ND	ug/kg	1.7	ND	ug/kg	1.7
4,4' - DDD	ND	ug/kg	1.7	ND	ug/kg	1.7
Endosulfan sulfate	ND	ug/kg	1.7	ND	ug/kg	1.7
4,4' - DDT	ND	ug/kg	1.7	ND	ug/kg	1.7
Methoxychlor	ND	ug/kg	17	ND	ug/kg	17
alpha-Chlordane	ND	ug/kg	1.7	ND	ug/kg	1.7
gamma-Chlordane	ND	ug/kg	1.7	ND	ug/kg	1.7
Toxaphene	ND	ug/kg	67	ND	ug/kg	67

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

SOLIDS	**RUN V3**								
Sample ID:	**RAW-V3-SL-01**			**PSD-V3-SL-01**			**PAQ-V3-SL-01**		
Receiving Date	3/18/99			3/19/99			3/19/99		
Sample Date									
Extraction Date	3/22/99			3/24/99			3/24/99		
Analysis Date:	4/9/99			4/12/99			4/9/99		
Matrix	SOLID			SOLID			SOLID		
Analyte	Result		D.L.	Result		D.L.	Result		D.L.
Herbicides									
2,4-D	ND	ug/kg	20						
2,4,5-TP (Silvex)	ND	ug/kg	40						
2,4,5-T	ND	ug/kg	40						
SOLIDS	**RUN V3**								
Sample ID:	**RAW-V3-SL-01**			**PSD-V3-SL-01**			**PAQ-V3-SL-01**		
Receiving Date	3/18/99			3/19/99			3/19/99		
Sample Date									
Extraction Date	3/23/99			3/24/99			3/24/99		
Analysis Date:	4/6/99			4/12/99			4/9/99		
Matrix	SOLID			SOLID			SOLID		
Analyte	Result		D.L.	Result		D.L.	Result		D.L.
Pesticides									
alpha-BHC	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
beta-BHC	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
delta-BHC	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
gamma-BHC (Lindane)	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Heptachlor	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Aldrin	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Heptachlor expoxide	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Endosulfan I	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Dieldrin	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
4,4' - DDE	45	ug/kg		21	ug/kg		120	ug/kg	
Endrin	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Endrin ketone	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Endrin aldehyde	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Endosulfan II	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
4,4' - DDD	27	ug/kg		16	ug/kg		61	ug/kg	
Endosulfan sulfate	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
4,4' - DDT	32	ug/kg		11	ug/kg		ND	ug/kg	17
Methoxychlor	ND	ug/kg	85	ND	ug/kg	34	ND	ug/kg	170
alpha-Chlordane	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
gamma-Chlordane	ND	ug/kg	8.5	ND	ug/kg	3.4	ND	ug/kg	17
Toxaphene	ND	ug/kg	340	ND	ug/kg	130	ND	ug/kg	670

Table D-5
BioGenesis Demonstration Project
Validation Test Runs
Herbicides and Pesticides Data

AQUEOUS	**RUN V3**											
Sample ID:	**RAW-V3-AQ-01**			**PAQ-V3-AQ-01**			**PSW-V3-AQ-01**			**FBK-V3-AQ-02**		
Receiving Date	3/19/99			3/19/99			3/19/99			3/19/99		
Sample Date												
Extraction Date	3/23/99			3/23/99			3/23/99			3/23/99		
Analysis Date:	4/9/99			4/9/99			4/9/99			4/9/99		
Matrix	WATER			WATER			WATER			WATER		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Herbicides												
2,4-D	ND	ug/L	8.0	ND	ug/L	4.0	ND	ug/L	12.0	ND	ug/L	4.0
2,4,5-TP (Silvex)	ND	ug/L	2.0	ND	ug/L	1.0	ND	ug/L	3.0	ND	ug/L	1.0
2,4,5-T	ND	ug/L	2.0	ND	ug/L	1.0	ND	ug/L	3.0	ND	ug/L	1.0

AQUEOUS	**RUN V3**											
Sample ID:	**RAW-V3-AQ-01**			**PAQ-V3-AQ-01**			**PSW-V3-AQ-01**			**FBK-V3-AQ-02**		
Receiving Date	3/19/99			3/19/99			3/19/99			3/19/99		
Sample Date												
Extraction Date	3/24/99			3/24/99			3/24/99			3/24/99		
Analysis Date:	4/9/99			4/9/99			4/9/99			4/9/99		
Matrix	WATER			WATER			WATER			WATER		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL
Pesticides												
alpha-BHC	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
beta-BHC	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
delta-BHC	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
gamma-BHC (Lindane)	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Heptachlor	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Aldrin	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Heptachlor expoxide	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Endosulfan I	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Dieldrin	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
4,4' - DDE	0.21	ug/L		ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Endrin	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Endrin ketone	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Endrin aldehyde	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Endosulfan II	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
4,4' - DDD	0.07	ug/L		ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Endosulfan sulfate	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
4,4' - DDT	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Methoxychlor	ND	ug/L	0.52	ND	ug/L	0.50	ND	ug/L	0.54	ND	ug/L	0.54
alpha-Chlordane	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
gamma-Chlordane	ND	ug/L	0.052	ND	ug/L	0.050	ND	ug/L	0.054	ND	ug/L	0.054
Toxaphene	ND	ug/L	2.1	ND	ug/L	2.0	ND	ug/L	2.1	ND	ug/L	2.1

Table D-6
BioGenesis Demonstration Project
Validation Test Runs
PCBs Data

SEDIMENTS	RUN V1					
Sample ID:	**RAW-V1-SD-01**		**RAW-V1-SD-02**		**RAW-V1-SD-02-DUP**	
Receiving Date:	3/17/99		3/17/99		3/17/99	
Sample Date:	3/16/99		3/16/99		3/16/99	
Extraction Date:	3/22/99		3/22/99		4/2/99	
Analysis Date:	4/8/99		4/8/99		4/9/99	
Matrix:	SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL
PCBs						
Aroclor 1016	ND ug/kg	33	ND ug/kg	33	MIS SIN G ug/kg	97
Aroclor 1221	ND ug/kg	33	ND ug/kg	33	MIS SIN G ug/kg	97
Aroclor 1232	ND ug/kg	33	ND ug/kg	33	MIS SIN G ug/kg	97
Aroclor 1242	ND ug/kg	33	ND ug/kg	33	MIS SIN G ug/kg	97
Aroclor 1248	ND ug/kg	33	ND ug/kg	33	MIS SIN G ug/kg	97
Aroclor 1254	ND ug/kg	33	ND ug/kg	33	MIS SIN G ug/kg	97
Aroclor 1260	ND ug/kg	33	ND ug/kg	33	MIS SIN G ug/kg	97

SOLIDS	RUN V1															
Sample ID:	**RAW-V1-SL-01**		**PPO-V1-SL-01**		**CCO-V1-SL-01**		**OXO-V1-SL-01**		**PSD-V1-SL-01**		**PSD-V1-SL-02**		**PSD-V1-SL-02 DUP**		**PAQ-V1-SL-01**	
Receiving Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/18/99	
Sample Date:	3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99	
Extraction Date:	3/22/99		3/22/99		3/22/99		3/22/99		3/22/99		3/22/99		3/23/99		3/23/99	
Analysis Date:	4/8/99		4/8/99		4/8/99		4/9/99		4/9/99		4/9/99		4/3/99		4/3/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
PCBs																
Aroclor 1016	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	41
Aroclor 1221	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	41
Aroclor 1232	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	41
Aroclor 1242	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	41
Aroclor 1248	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	41
Aroclor 1254	260 ug/kg	33	250 ug/kg	33	410 ug/kg	33	380 ug/kg	33	220 ug/kg	33	190 ug/kg	33	170 ug/kg	33	420 ug/kg	41
Aroclor 1260	170 ug/kg	33	ND ug/kg	33	ND ug/kg	33	210 ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	310 ug/kg	41

AQUEOUS	RUN V1													
Sample ID:	**RAW-V1-AQ-01**		**PPO-V1-AQ-01**		**CCO-V1-AQ-01**		**OXO-V1-AQ-01**		**PAQ-V1-AQ-01**		**PAQ-V1-AQ-02**		**PAQ-V1-AQ-02-DUP**	
Receiving Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/18/99		3/18/99		3/18/99	
Sample Date:	3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99			
Extraction Date:	3/19/99		3/19/99		3/19/99		3/19/99		3/19/99		3/19/99		3/19/99	
Analysis Date:	4/7/99		4/7/99		4/7/99		4/7/99		4/6/99		4/6/99		4/7/99	
Matrix:	WATER		WATER		WATER		WATER		WATER		WATER		WATER	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
PCBs														
Aroclor 1016	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1221	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1232	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1242	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1248	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1254	1.2 ug/L	1	1 ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1260	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1

Table D-6
BioGenesis Demonstration Project
Validation Test Runs
PCBs Data

SEDIMENTS	**RUN V2**	
Sample ID:	**RAW-V2-SD-01**	
Receiving Date:	3/18/99	
Sample Date:	3/16/99	
Extraction Date:	3/22/99	
Analysis Date:	4/8/99	
Matrix:	SOLID	
Analyte	Result	LDL
PCBs		
Aroclor 1016	ND ug/kg	33
Aroclor 1221	ND ug/kg	33
Aroclor 1232	ND ug/kg	33
Aroclor 1242	ND ug/kg	33
Aroclor 1248	ND ug/kg	33
Aroclor 1254	45 ug/kg	33
Aroclor 1260	ND ug/kg	33

SOLIDS	**RUN V2**											
Sample ID:	**RAW-V2-SL-01**		**PPO-V2-SL-01**		**CCO-V2-SL-01**		**OXO-V2-SL-01**		**PSD-V2-SL-01**		**PAQ-V2-SL-01**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Sample Date:	3/16/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99	
Extraction Date:	3/23/99		3/24/99		3/23/99		3/23/99		3/23/99		3/23/99	
Analysis Date:	4/3/99		4/9/99		4/3/99		4/3/99		4/3/99		4/5/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
PCBs												
Aroclor 1016	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	66
Aroclor 1221	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	66
Aroclor 1232	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	66
Aroclor 1242	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	66
Aroclor 1248	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	66
Aroclor 1254	330 ug/kg	33	350 ug/kg	33	430 ug/kg	33	260 ug/kg	33	130 ug/kg	33	730 ug/kg	66
Aroclor 1260	230 ug/kg	33	190 ug/kg P	33	310 ug/kg	33	160 ug/kg	33	ND ug/kg	33	460 ug/kg	66

AQUEOUS	**RUN V2**									
Sample ID:	**RAW-V2-AQ-01**		**PPO-V2-AQ-01**		**CCO-V2-AQ-01**		**OXO-V2-AQ-01**		**PAQ-V2-AQ-01**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Sample Date:	3/16/99		3/17/99		3/17/99		3/17/99		3/17/99	
Extraction Date:	3/19/99		3/22/99		3/19/99		3/19/99		3/19/99	
Analysis Date:	4/6/99		4/6/99		4/6/99		4/6/99		4/7/99	
Matrix:	WATER		WATER		WATER		WATER		WATER	
Analyte	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL
PCBs										
Aroclor 1016	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1221	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1232	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1242	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1248	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1254	1.4 ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1
Aroclor 1260	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1

Table D-6
BioGenesis Demonstration Project
Validation Test Runs
PCBs Data

SEDIMENTS	RUN V3			
Sample ID:	**RAW-V3-SD-01**		**CBK-V3-SD-01**	
Receiving Date:	3/18/99		3/18/99	
Sample Date:	3/17/99		3/17/99	
Extraction Date:	3/22/99		3/24/99	
Analysis Date:	4/8/99		4/9/99	
Matrix:	SOLID		SOLID	
Analyte	Results	LDL	Results	LDL
PCBs				
Aroclor 1016	ND ug/kg	33	ND ug/kg	33
Aroclor 1221	ND ug/kg	33	ND ug/kg	33
Aroclor 1232	ND ug/kg	33	ND ug/kg	33
Aroclor 1242	ND ug/kg	33	ND ug/kg	33
Aroclor 1248	ND ug/kg	33	ND ug/kg	33
Aroclor 1254	ND ug/kg	33	ND ug/kg	33
Aroclor 1260	ND ug/kg	33	ND ug/kg	33

SOLIDS	RUN V3											
Sample ID:	**RAW-V3-SL-01**		**PPO-V3-SL-01**		**CCO-V3-SL-01**		**OXO-V3-SL-01**		**PSD-V3-SL-01**		**PAQ-V3-SL-01**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/19/99		3/19/99	
Sample Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99	
Extraction Date:	3/23/99		3/23/99		3/24/99		3/24/99		3/24/99		3/24/99	
Analysis Date:	4/3/99		4/3/99		4/9/99		4/9/99		4/12/99		4/12/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL
PCBs												
Aroclor 1016	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	160
Aroclor 1221	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	160
Aroclor 1232	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	160
Aroclor 1242	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	160
Aroclor 1248	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	33	ND ug/kg	160
Aroclor 1254	320 ug/kg	33	170 ug/kg	33	300 ug/kg	33	400 ug/kg	33	260 ug/kg	33	1600 ug/kg	160
Aroclor 1260	240 ug/kg	33	ND ug/kg	33	150 ug/kg P	33	190 ug/kg	33	ND ug/kg	33	1200 ug/kg	160

AQUEOUS	RUN V3													
Sample ID:	**RAW-V3-AQ-01**		**PPO-V3-AQ-01**		**CCO-V3-AQ-01**		**OXO-V3-AQ-01**		**PAQ-V3-AQ-01**		**PSW-V3-AQ-01**		**FBK-V3-AQ-02**	
Receiving Date:	3/19/99		3/18/99		3/18/99		3/18/99		3/19/99		3/19/99		3/19/99	
Sample Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/16/99		3/18/99			
Extraction Date:	3/24/99		3/19/99		3/19/99		3/22/99		3/24/99		3/24/99		3/24/99	
Analysis Date:	4/9/99		3/17/99		3/17/99		4/7/99		4/9/99		4/9/99		4/9/99	
Matrix:	WATER		WATER		WATER		WATER		WATER		WATER		WATER	
Analyte	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL
PCBs														
Aroclor 1016	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1.1	ND ug/L	1.1
Aroclor 1221	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1.1	ND ug/L	1.1
Aroclor 1232	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1.1	ND ug/L	1.1
Aroclor 1242	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1.1	ND ug/L	1.1
Aroclor 1248	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1.1	ND ug/L	1.1
Aroclor 1254	1.6 ug/L P	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1.1	ND ug/L	1.1
Aroclor 1260	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1	ND ug/L	1.1	ND ug/L	1.1

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

SEDIMENTS	**RUN V1**			
Sample ID:	**RAW-V1-SD-01**		**RAW-V1-SD-02**	
Receiving Date	3/18/99		3/18/99	
Sample Date	3/16/99		3/16/99	
Extraction Date	3/22/99		3/22/99	
Analysis Date:	4/6/99		4/6/99	
Matrix	Solid		Solid	
Analyte	Result	DL	Result	DL
PCB High Resolution				
2-MonoCB	460 pg/g	40	460 pg/g	40
Total Monochlorobiphenyls	1,000 pg/g	40	1,100 pg/g	40
4,4'-DiCB	6,400 pg/g	40	8,600 pg/g	40
Total Dichlorobiphenyls	17,000 pg/g	40	23,000 pg/g	40
2,4,4'-TriCB	18,000 pg/g	40	29,000 pg/g	40
Total Trichlorobiphenyls	66,000 pg/g	40	110,000 pg/g	40
2,2',5,5'-TetraCB	8,400 pg/g	40	15,000 pg/g	40
3,3',4,4'-TetraCB (#77)	2,300 pg/g	40	2,700 pg/g	40
Total Tetrachlorobiphenyls	69,000 pg/g	40	88,000 pg/g	40
2,3,3',4,4'-PentaCB (#105)	4,600 pg/g	40	7,900 pg/g	40
2,3',4,4',5-PentaCB (#118)	8,300 pg/g	40	14,000 pg/g	40
3,3',4,4',5-Penta CB (#126)	62 pg/g	40	80 pg/g	40
Total Pentachlorobiphenyls	77,000 pg/g	40	100,000 pg/g	40
2,3,3',4,4',5-Hexa CB (#156)	910 pg/g	40	1,500 pg/g	40
3,3',4,4',5,5'-HexaCB (#169)	ND pg/g	40	ND pg/g	40
Total Hexachlorobiphenyls	38,000 pg/g	40	62,000 pg/g	40
2,2',3,4,4',5,5'-HeptaCB (#180)	6,000 pg/g	40	9,900 pg/g	40
Total Heptachlorobiphenyls	21,000 pg/g	40	37,000 pg/g	40
2,2',3,3',4,4',5,5'-OctaCB	1,700 pg/g	40	2,900 pg/g	40
Total Octachlorobiphenyls	7,200 pg/g	40	12,000 pg/g	40
2,2',3,3',4,4',5,5',6-NonaCB	2,000 pg/g	40	3,200 pg/g	40
Total Nonachlorobiphenyls	2,500 pg/g	40	3,600 pg/g	40
DecaCB	1,400 pg/g	40	2,400 pg/g	40

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

SOLIDS	**RUN V1**					
Sample ID:	**RAW-V1-SL-01**		**PSD-V1-SL-02**		**PAQ-V1-SL-01**	
Receiving Date	3/18/99		3/18/99		3/18/99	
Sample Date	3/16/99		3/16/99		3/16/99	
Extraction Date	3/22/99		3/22/99		3/22/99	
Analysis Date:	4/6/99		4/6/99		4/6/99	
Matrix	Solid		Solid		Solid	
Analyte	Result	DL	Result	DL	Result	DL
PCB High Resolution						
2-MonoCB	820 pg/g	40	600 pg/g	40	420 pg/g	40
Total Monochlorobiphenyls	2,000 pg/g	40	1,400 pg/g	40	1,100 pg/g	40
4,4'-DiCB	11,000 pg/g	40	8,000 pg/g	40	9,600 pg/g	40
Total Dichlorobiphenyls	32,000 pg/g	40	20,000 pg/g	40	24,000 pg/g	40
2,4,4'-TriCB	28,000 pg/g	40	9,700 pg/g	40	23,000 pg/g	40
Total Trichlorobiphenyls	120,000 pg/g	40	44,000 pg/g	40	88,000 pg/g	40
2,2',5,5'-TetraCB	16,000 pg/g	40	7,500 pg/g	40	18,000 pg/g	40
3,3',4,4'-TetraCB (#77)	3,400 pg/g	40	2,300 pg/g	40	3,000 pg/g	40
Total Tetrachlorobiphenyls	93,000 pg/g	40	58,000 pg/g	40	130,000 pg/g	40
2,3,3',4,4'-PentaCB (#105)	13,000 pg/g	40	3,700 pg/g	40	7,700 pg/g	40
2,3',4,4',5-PentaCB (#118)	7,900 pg/g	40	6,000 pg/g	40	13,000 pg/g	40
3,3',4,4',5-Penta CB (#126)	96 pg/g	40	53 pg/g	40	100 pg/g	40
Total Pentachlorobiphenyls	110,000 pg/g	40	42,000 pg/g	40	96,000 pg/g	40
2,3,3',4,4',5-Hexa CB (#156)	1,400 pg/g	40	650 pg/g	40	1,700 pg/g	40
3,3',4,4',5,5'-HexaCB (#169)	ND pg/g	40	ND pg/g	40	ND pg/g	40
Total Hexachlorobiphenyls	53,000 pg/g	40	22,000 pg/g	40	65,000 pg/g	40
2,2',3,4,4',5,5'-HeptaCB (#180)	8,700 pg/g	40	5,100 pg/g	40	13,000 pg/g	40
Total Heptachlorobiphenyls	33,000 pg/g	40	19,000 pg/g	40	47,000 pg/g	40
2,2',3,3',4,4',5,5'-OctaCB	2,700 pg/g	40	1,200 pg/g	40	3,500 pg/g	40
Total Octachlorobiphenyls	12,000 pg/g	40	3,700 pg/g	40	13,000 pg/g	40
2,2',3,3',4,4',5,5',6-NonaCB	3,200 pg/g	40	780 pg/g	40	3,800 pg/g	40
Total Nonachlorobiphenyls	3,900 pg/g	40	810 pg/g	40	4,600 pg/g	40
DecaCB	2,000 pg/g	40	800 pg/g	40	2,900 pg/g	40

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

AQUEOUS	**RUN V1**									
Sample ID:	**RAW-V1-AQ-01**			**PSD-V1-AQ-01**		**PAQ-V1-AQ-01**			**PAQ-V1-AQ-02**			**PAQ-V1-AQ-02 Dup**		
Receiving Date	3/18/99			NA		3/18/99			3/18/99			3/18/99		
Sample Date	3/16/99			NA		3/16/99			3/16/99			3/16/99		
Extraction Date	3/23/99			NA		3/23/99			3/23/99			3/23/99		
Analysis Date:	4/6/99			NA		4/6/99			4/6/99			4/6/99		
Matrix	Aqueous			NA		Aqueous			Aqueous			Aqueous		
Analyte	Result		DL	Result	DL	Result		DL	Result		DL	Result		DL
PCB High Resolution														
2-MonoCB	50,000 pg/L	D	2,500	NA		8,700 pg/L		500	8,200 pg/L		500	6,500 pg/L		500
Total Monochlorobiphenyls	110,000 pg/L	D	2,500	NA		19,000 pg/L		500	19,000 pg/L		500	14,000 pg/L		500
4,4'-DiCB	910,000 pg/L	DBE	2,500	NA		150,000 pg/L	BE	500	160,000 pg/L	BE	500	100,000 pg/L	BE	500
Total Dichlorobiphenyls	2,600,000 pg/L	D	2,500	NA		420,000 pg/L		500	430,000 pg/L		500	270,000 pg/L		500
2,4,4'-TriCB	3,600,000 pg/L	DBE	2,500	NA		550,000 pg/L	BE	500	590,000 pg/L	BE	500	420,000 pg/L	BE	500
Total Trichlorobiphenyls	7,300,000 pg/L	D	2,500	NA		2,100,000 pg/L		500	2,400,000 pg/L		500	1,500,000 pg/L		500
2,2',5,5'-TetraCB	2,600,000 pg/L	DBE	2,500	NA		360,000 pg/L	BE	500	350,000 pg/L	BE	500	280,000 pg/L	BE	500
3,3',4,4'-TetraCB (#77)	310,000 pg/L	DE	2,500	NA		53,000 pg/L		500	55,000 pg/L		500	41,000 pg/L		500
Total Tetrachlorobiphenyls	18,000,000 pg/L	D	2,500	NA		2,600,000 pg/L		500	2,500,000 pg/L		500	2,100,000 pg/L		500
2,3,3',4,4'-PentaCB (#105)	630,000 pg/L	DBE	2,500	NA		150,000 pg/L	BE	500	180,000 pg/L	BE	500	130,000 pg/L	BE	500
2,3',4,4',5-PentaCB (#118)	1,500,000 pg/L	DBE	2,500	NA		260,000 pg/L	BE	500	270,000 pg/L	BE	500	220,000 pg/L	BE	500
3,3',4,4',5-Penta CB (#126)	7,000 pg/L	D	2,500	NA		2,000 pg/L		500	2,200 pg/L		500	1,300 pg/L		500
Total Pentachlorobiphenyls	10,000,000 pg/L	D	2,500	NA		2,400,000 pg/L		500	2,600,000 pg/L		500	2,100,000 pg/L		500
2,3,3',4,4',5-Hexa CB (#156)	200,000 pg/L	E	500	NA		26,000 pg/L		500	33,000 pg/L		500	24,000 pg/L		500
3,3',4,4',5,5'-HexaCB (#169)	ND pg/L		500	NA		ND pg/L		500	ND pg/L		500	ND pg/L		500
Total Hexachlorobiphenyls	9,800,000 pg/L		500	NA		1,100,000 pg/L		500	1,400,000 pg/L		500	1,000,000 pg/L		500
2,2',3,4,4',5,5'-HeptaCB (#180)	1,300,000 pg/L	BE	500	NA		220,000 pg/L	BE	500	230,000 pg/L	BE	500	180,000 pg/L	BE	500
Total Heptachlorobiphenyls	5,000,000 pg/L		500	NA		820,000 pg/L		500	890,000 pg/L		500	650,000 pg/L		500
2,2',3,3',4,4',5,5'-OctaCB	460,000 pg/L	E	500	NA		69,000 pg/L		500	69,000 pg/L		500	47,000 pg/L		500
Total Octachlorobiphenyls	1,900,000 pg/L		500	NA		280,000 pg/L		500	300,000 pg/L		500	210,000 pg/L		500
2,2',3,3',4,4',5,5',6-NonaCB	540,000 pg/L	E	500	NA		83,000 pg/L		500	78,000 pg/L		500	54,000 pg/L		500
Total Nonachlorobiphenyls	650,000 pg/L		500	NA		98,000 pg/L		500	93,000 pg/L		500	77,000 pg/L		500
DecaCB	280,000 pg/L	E	500	NA		50,000 pg/L		500	51,000 pg/L		500	35,000 pg/L		500

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

SEDIMENTS	**RUN V2**			
Sample ID:	**RAW-V2-SD-01**			
Receiving Date	3/23/99			
Sample Date	3/16/99			
Extraction Date	3/23/99			
Analysis Date:	4/18/99			
Matrix	Solid			
Analyte	Result			DL
PCB High Resolution				
2-MonoCB	150	pg/g		2.0
Total Monochlorobiphenyls	470	pg/g		2.0
4,4'-DiCB	3,500	pg/g	BE	2.0
Total Dichlorobiphenyls	10,000	pg/g		2.0
2,4,4'-TriCB	11,000	pg/g	BE	2.0
Total Trichlorobiphenyls	35,000	pg/g		2.0
2,2',5,5'-TetraCB	4,800	pg/g	BE	2.0
3,3',4,4'-TetraCB (#77)	1,200	pg/g		2.0
Total Tetrachlorobiphenyls	34,000	pg/g		2.0
2,3,3',4,4'-PentaCB (#105)	2,600	pg/g	E	2.0
2,3',4,4',5-PentaCB (#118)	5,200	pg/g	BE	2.0
3,3',4,4',5-Penta CB (#126)	29	pg/g		2.0
Total Pentachlorobiphenyls	36,000	pg/g		2.0
2,3,3',4,4',5-Hexa CB (#156)	510	pg/g	E	2.0
3,3',4,4',5,5'-HexaCB (#169)	ND	pg/g		2.0
Total Hexachlorobiphenyls	20,000	pg/g		2.0
2,2',3,4,4',5,5'-HeptaCB (#180)	4,200	pg/g	BE	2.0
Total Heptachlorobiphenyls	16,000	pg/g		2.0
2,2',3,3',4,4',5,5'-OctaCB	980	pg/g		2.0
Total Octachlorobiphenyls	2,700	pg/g		2.0
2,2',3,3',4,4',5,5',6-NonaCB	880	pg/g		2.0
Total Nonachlorobiphenyls	1,100	pg/g		2.0
DecaCB	910	pg/g		2.0

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

SOLIDS	**RUN V2**					
Sample ID:	**RAW-V2-SL-01**		**PSD-V2-SL-01**		**PAQ-V2-SL-01**	
Receiving Date	3/18/99		3/18/99		3/18/99	
Sample Date	3/16/99		3/16/99		3/16/99	
Extraction Date	3/22/99		3/22/99		3/22/99	
Analysis Date:	4/6/99		4/6/99		4/6/99	
Matrix	Solid		Solid		Solid	
Analyte	Result	DL	Result	DL	Result	DL
PCB High Resolution						
2-MonoCB	490 pg/g	40	440 pg/g	40	440 pg/g	40
Total Monochlorobiphenyls	1,100 pg/g	40	1,100 pg/g	40	1,300 pg/g	40
4,4'-DiCB	7,900 pg/g	40	7,900 pg/g	40	10,000 pg/g	40
Total Dichlorobiphenyls	19,000 pg/g	40	19,000 pg/g	40	26,000 pg/g	40
2,4,4'-TriCB	16,000 pg/g	40	17,000 pg/g	40	23,000 pg/g	40
Total Trichlorobiphenyls	64,000 pg/g	40	63,000 pg/g	40	91,000 pg/g	40
2,2',5,5'-TetraCB	10,000 pg/g	40	8,300 pg/g	40	20,000 pg/g	40
3,3',4,4'-TetraCB (#77)	2,200 pg/g	40	2,500 pg/g	40	3,300 pg/g	40
Total Tetrachlorobiphenyls	76,000 pg/g	40	54,000 pg/g	40	140,000 pg/g	40
2,3,3',4,4'-PentaCB (#105)	4,500 pg/g	40	4,000 pg/g	40	16,000 pg/g	40
2,3',4,4',5-PentaCB (#118)	6,400 pg/g	40	6,700 pg/g	40	8,500 pg/g	40
3,3',4,4',5-Penta CB (#126)	67 pg/g	40	58 pg/g	40	110 pg/g	40
Total Pentachlorobiphenyls	57,000 pg/g	40	46,000 pg/g	40	96,000 pg/g	40
2,3,3',4,4',5-Hexa CB (#156)	970 pg/g	40	760 pg/g	40	1,800 pg/g	40
3,3',4,4',5,5'-HexaCB (#169)	ND pg/g	40	ND pg/g	40	ND pg/g	40
Total Hexachlorobiphenyls	37,000 pg/g	40	27,000 pg/g	40	72,000 pg/g	40
2,2',3,4,4',5,5'-HeptaCB (#180)	8,100 pg/g	40	5,400 pg/g	40	15,000 pg/g	40
Total Heptachlorobiphenyls	28,000 pg/g	40	19,000 pg/g	40	53,000 pg/g	40
2,2',3,3',4,4',5,5'-OctaCB	2,000 pg/g	40	1,300 pg/g	40	3,700 pg/g	40
Total Octachlorobiphenyls	7,300 pg/g	40	4,800 pg/g	40	13,000 pg/g	40
2,2',3,3',4,4',5,5',6-NonaCB	1,900 pg/g	40	1,300 pg/g	40	3,700 pg/g	40
Total Nonachlorobiphenyls	2,200 pg/g	40	1,600 pg/g	40	4,400 pg/g	40
DecaCB	1,500 pg/g	40	930 pg/g	40	3,100 pg/g	40

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

AQUEOUS	**RUN V2**							
Sample ID:	**RAW-V2-AQ-01**			**PSD-V2-AQ-01**			**PAQ-V2-AQ-01**	
Receiving Date	3/18/99			NA			3/18/99	
Sample Date	3/16/99			NA			3/16/99	
Extraction Date	3/23/99			NA			3/23/99	
Analysis Date:	4/6/99			NA			4/20/99	
Matrix	Aqueous			NA			Aqueous	
Analyte	Result		DL	Result		DL	Result	DL
PCB High Resolution								
2-MonoCB	7,400	pg/L	500	NA			970 pg/L	20
Total Monochlorobiphenyls	17,000	pg/L	500	NA			2,000 pg/L	20
4,4'-DiCB	110,000	pg/L BE	500	NA			11,000 pg/L	20
Total Dichlorobiphenyls	330,000	pg/L	500	NA			39,000 pg/L	20
2,4,4'-TriCB	480,000	pg/L BE	500	NA			41,000 pg/L B	20
Total Trichlorobiphenyls	2,100,000	pg/L	500	NA			160,000 pg/L	20
2,2',5,5'-TetraCB	310,000	pg/L BE	500	NA			24,000 pg/L B	20
3,3',4,4'-TetraCB (#77)	45,000	pg/L	500	NA			2,800 pg/L	20
Total Tetrachlorobiphenyls	2,200,000	pg/L	500	NA			170,000 pg/L	20
2,3,3',4,4'-PentaCB (#105)	140,000	pg/L BE	500	NA			9,500 pg/L B	20
2,3',4,4',5-PentaCB (#118)	260,000	pg/L BE	500	NA			20,000 pg/L B	20
3,3',4,4',5-Penta CB (#126)	1,500	pg/L	500	NA			74 pg/L	20
Total Pentachlorobiphenyls	2,300,000	pg/L	500	NA			160,000 pg/L	20
2,3,3',4,4',5-Hexa CB (#156)	33,000	pg/L	500	NA			1,800 pg/L	20
3,3',4,4',5,5'-HexaCB (#169)	ND	pg/L	500	NA			ND pg/L	20
Total Hexachlorobiphenyls	1,300,000	pg/L	500	NA			76,000 pg/L	20
2,2',3,4,4',5,5'-HeptaCB (#180)	250,000	pg/L BE	500	NA			15,000 pg/L B	20
Total Heptachlorobiphenyls	850,000	pg/L	500	NA			54,000 pg/L	20
2,2',3,3',4,4',5,5'-OctaCB	70,000	pg/L	500	NA			3,400 pg/L	20
Total Octachlorobiphenyls	300,000	pg/L	500	NA			12,000 pg/L	20
2,2',3,3',4,4',5,5',6-NonaCB	86,000	pg/L	500	NA			3,300 pg/L	20
Total Nonachlorobiphenyls	110,000	pg/L	500	NA			3,900 pg/L	20
DecaCB	47,000	pg/L	500	NA			2,900 pg/L	20

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

SEDIMENTS	**RUN V3**					
Sample ID:	**RAW-V3-SD-01**			**CBK-V3-SD-01**		
Receiving Date	3/23/99			3/20/99		
Sample Date	3/16/99			3/17/99		
Extraction Date	3/23/99			3/23/99		
Analysis Date:	4/18/99			4/18/99		
Matrix	Solid			Solid		
Analyte	Result		DL	Result		DL
PCB High Resolution						
2-MonoCB	190 pg/g		2.0	69 pg/L		2.0
Total Monochlorobiphenyls	490 pg/g		2.0	80 pg/L		2.0
4,4'-DiCB	3,700 pg/g	BE	2.0	6.8 pg/L	B	2.0
Total Dichlorobiphenyls	10,000 pg/g		2.0	88 pg/L		2.0
2,4,4'-TriCB	11,000 pg/g	BE	2.0	14 pg/L	B	2.0
Total Trichlorobiphenyls	35,000 pg/g		2.0	63 pg/L		2.0
2,2',5,5'-TetraCB	4,700 pg/g	BE	2.0	26 pg/L	B	2.0
3,3',4,4'-TetraCB (#77)	1,300 pg/g		2.0	2 pg/L		2.0
Total Tetrachlorobiphenyls	34,000 pg/g		2.0	120 pg/L		2.0
2,3,3',4,4'-PentaCB (#105)	2,400 pg/g	E	2.0	5 pg/L		2.0
2,3',4,4',5-PentaCB (#118)	5,100 pg/g	BE	2.0	ND pg/L		2.0
3,3',4,4',5-Penta CB (#126)	32 pg/g		2.0	ND pg/L		2.0
Total Pentachlorobiphenyls	37,000 pg/g		2.0	210 pg/L		2.0
2,3,3',4,4',5-Hexa CB (#156)	520 pg/g		2.0	4.9 pg/L		2.0
3,3',4,4',5,5'-HexaCB (#169)	ND pg/g		2.0	ND pg/L		2.0
Total Hexachlorobiphenyls	21,000 pg/g		2.0	230 pg/L		2.0
2,2',3,4,4',5,5'-HeptaCB (#180)	4,200 pg/g	BE	2.0	86 pg/L	B	2.0
Total Heptachlorobiphenyls	16,000 pg/g		2.0	280 pg/L		2.0
2,2',3,3',4,4',5,5'-OctaCB	970 pg/g		2.0	19 pg/L		2.0
Total Octachlorobiphenyls	3,200 pg/g		2.0	56 pg/L		2.0
2,2',3,3',4,4',5,5',6-NonaCB	1,000 pg/g		2.0	5.7 pg/L		2.0
Total Nonachlorobiphenyls	1,300 pg/g		2.0	5.7 pg/L		2.0
DecaCB	910 pg/g		2.0	ND pg/L		2.0

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

SOLIDS	**RUN V3**							
Sample ID:	**RAW-V3-SL-01**			**PSD-V3-SL-01**			**PAQ-V3-SL-01**	
Receiving Date	3/18/99			3/20/99			3/20/99	
Sample Date	3/16/99			3/17/99			3/17/99	
Extraction Date	3/22/99			3/23/99			3/23/99	
Analysis Date:	4/6/99			4/18/99			4/18/99	
Matrix	Solid			Solid			Solid	
Analyte	Result		DL	Result		DL	Result		DL
PCB High Resolution									
2-MonoCB	380	pg/g	40.0	340	pg/g	2.0	450	pg/g	2.0
Total Monochlorobiphenyls	1,000	pg/g	40.0	1,100	pg/g	2.0	1,300	pg/g	2.0
4,4'-DiCB	9,400	pg/g	40.0	7,400	pg/g BE	2.0	11,000	pg/g BE	2.0
Total Dichlorobiphenyls	23,000	pg/g	40.0	21,000	pg/g	2.0	32,000	pg/g	2.0
2,4,4'-TriCB	24,000	pg/g	40.0	14,000	pg/g E	2.0	37,000	pg/g BDE	10.0
Total Trichlorobiphenyls	91,000	pg/g	40.0	49,000	pg/g	2.0	130,000	pg/g D	10.0
2,2',5,5'-TetraCB	16,000	pg/g	40.0	7,000	pg/g BE	2.0	19,000	pg/g BE	2.0
3,3',4,4'-TetraCB (#77)	3,000	pg/g	40.0	2,400	pg/g E	2.0	3,700	pg/g E	2.0
Total Tetrachlorobiphenyls	120,000	pg/g	40.0	48,000	pg/g	2.0	98,000	pg/g E	2.0
2,3,3',4,4'-PentaCB (#105)	7,200	pg/g	40.0	3,600	pg/g E	2.0	9,000	pg/g E	2.0
2,3',4,4',5-PentaCB (#118)	12,000	pg/g	40.0	7,400	pg/g EB	2.0	1,700	pg/g BE	2.0
3,3',4,4',5-Penta CB (#126)	110	pg/g	40.0	39	pg/g	2.0	92	pg/g	2.0
Total Pentachlorobiphenyls	87,000	pg/g	40.0	41,000	pg/g	2.0	95,000	pg/g	2.0
2,3,3',4,4',5-Hexa CB (#156)	1,500	pg/g	40.0	690	pg/g	2.0	2,000	pg/g	2.0
3,3',4,4',5,5'-HexaCB (#169)	ND	pg/g	40.0	2.8	pg/g	2.0	4.6	pg/g	2.0
Total Hexachlorobiphenyls	55,000	pg/g	40.0	26,000	pg/g	2.0	81,000	pg/g	2.0
2,2',3,4,4',5,5'-HeptaCB (#180)	13,000	pg/g	40.0	5,200	pg/g EB	2.0	16,000	pg/g EB	2.0
Total Heptachlorobiphenyls	47,000	pg/g	40.0	19,000	pg/g	2.0	61,000	pg/g	2.0
2,2',3,3',4,4',5,5'-OctaCB	2,900	pg/g	40.0	1,300	pg/g	2.0	4,000	pg/g E	2.0
Total Octachlorobiphenyls	10,000	pg/g	40.0	3,800	pg/g	2.0	11,000	pg/g	2.0
2,2',3,3',4,4',5,5',6-NonaCB	3,000	pg/g	40.0	1,100	pg/g	2.0	3,400	pg/g E	2.0
Total Nonachlorobiphenyls	3,700	pg/g	40.0	1,400	pg/g	2.0	4,400	pg/g	2.0
DecaCB	2,500	pg/g	40.0	1,000	pg/g	2.0	3,600	pg/g E	2.0

Table D-7
BioGenesis Demonstration Project
Validation Test Runs
PCB Congeners Data

AQUEOUS	**RUN V3**									
Sample ID:	**RAW-V3-AQ-01**		**PSD-V3-AQ-01**		**PAQ-V3-AQ-01**		**PSW-V3-AQ-01**		**FBK-V3-AQ-02**	
Receiving Date	3/20/99		NA		3/20/99		3/20/99		3/20/99	
Sample Date	3/17/99		NA		3/17/99		3/18/99		3/18/99	
Extraction Date	3/23/99		NA		3/23/99		3/23/99		3/23/99	
Analysis Date:	4/18/99		NA		4/18/99		4/19/99		4/19/99	
Matrix	Aqueous		NA		Aqueous		Aqueous		Aqueous	
Analyte	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL
PCB High Resolution										
2-MonoCB	71,000 pg/L E	20	NA		9,600 pg/L	20	ND pg/L	20	ND pg/L	20
Total Monochlorobiphenyls	150,000 pg/L	20	NA		20,000 pg/L	20	ND pg/L	20	ND pg/L	20
4,4'-DiCB	740,000 pg/L BE	20	NA		140,000 pg/L BE	20	95 pg/L B	20	84 pg/L B	20
Total Dichlorobiphenyls	2,300,000 pg/L	20	NA		440,000 pg/L	20	300 pg/L	20	750 pg/L	20
2,4,4'-TriCB	1,700,000 pg/L BEF	20	NA		440,000 pg/L BE	20	370 pg/L B	20	350 pg/L B	20
Total Trichlorobiphenyls	6,800,000 pg/L	20	NA		1,500,000 pg/L	20	1,200 pg/L	20	1,200 pg/L	20
2,2',5,5'-TetraCB	1,500,000 pg/L BE	20	NA		310,000 pg/L BE	20	390 pg/L B	20	320 pg/L B	20
3,3',4,4'-TetraCB (#77)	240,000 pg/L E	20	NA		52,000 pg/L E	20	35 pg/L	20	32 pg/L	20
Total Tetrachlorobiphenyls	9,400,000 pg/L	20	NA		2,100,000 pg/L	20	2,200 pg/L	20	1,600 pg/L	20
2,3,3',4,4'-PentaCB (#105)	590,000 pg/L BE	20	NA		140,000 pg/L BE	20	97 pg/L B	20	71 pg/L B	20
2,3',4,4',5-PentaCB (#118)	ND pg/L	20	NA		ND pg/L	20	ND pg/L	20	ND pg/L	20
3,3',4,4',5-Penta CB (#126)	5,200 pg/L	20	NA		1,400 pg/L	20	ND pg/L	20	ND pg/L	20
Total Pentachlorobiphenyls	7,400,000 pg/L	20	NA		1,800,000 pg/L	20	2,500 pg/L	20	1,700 pg/L	20
2,3,3',4,4',5-Hexa CB (#156)	140,000 pg/L E	20	NA		27,000 pg/L E	20	40 pg/L	20	24 pg/L	20
3,3',4,4',5,5'-HexaCB (#169)	290 pg/L	20	NA		70 pg/L	20	ND pg/L	20	ND pg/L	20
Total Hexachlorobiphenyls	6,000,000 pg/L	20	NA		1,200,000 pg/L	20	2,800 pg/L	20	1,400 pg/L	20
2,2',3,4,4',5,5'-HeptaCB (#180)	1,200,000 pg/L BE	20	NA		250,000 pg/L BE	20	730 pg/L B	20	410 pg/L B	20
Total Heptachlorobiphenyls	4,500,000 pg/L	20	NA		910,000 pg/L	20	2,800 pg/L	20	1,500 pg/L	20
2,2',3,3',4,4',5,5'-OctaCB	270,000 pg/L E	20	NA		52,000 pg/L E	20	100 pg/L	20	52 pg/L	20
Total Octachlorobiphenyls	890,000 pg/L	20	NA		190,000 pg/L	20	300 pg/L	20	170 pg/L	20
2,2',3,3',4,4',5,5',6-NonaCB	290,000 pg/L E	20	NA		62,000 pg/L	20	51 pg/L	20	30 pg/L	20
Total Nonachlorobiphenyls	320,000 pg/L	20	NA		56,000 pg/L E	20	51 pg/L	20	30 pg/L	20
DecaCB	210,000 pg/L E	20	NA		41,000 pg/L E	20	ND pg/L	20	ND pg/L	20

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

SEDIMENTS					
Sample ID:	**RAW-V1-SD-01**			**RAW-V1-SD-02**	
Receiving Date	3/18/99			3/18/99	
Sample Date	3/16/99			3/16/99	
Extraction Date	3/23/99			3/23/99	
Analysis Date:	4/1/99			4/1/99	
Matrix	Solid			Solid	
Analyte	Result		DL	Result	DL
Furans					
TCDFs (total)	240 pg/g			230 pg/g	
2,3,7,8-TCDF	14 pg/g	g		11 pg/g	g
PeCDFs (total)	230 pg/g			210 pg/g	
1,2,3,7,8-PeCDF	8.4 pg/g			7.2 pg/g	
2,3,4,7,8-PeCDF	18 pg/g			13 pg/g	
HxCDFs (total)	210 pg/g			180 pg/g	
1,2,3,4,7,8-HxCDF	76 pg/g			64 pg/g	
1,2,3,6,7,8-HxCDF	ND pg/g	v	18	ND pg/g	v 15
2,3,4,6,7,8-HxCDF	7.8 pg/g			6.9 pg/g	
1,2,3,7,8,9-HxCDF	ND pg/g		0.29	ND pg/g	0.52
HpCDFs (total)	360 pg/g			310 pg/g	
1,2,3,4,6,7,8-HpCDF	260 pg/g			220 pg/g	
1,2,3,4,7,8,9-HpCDF	9.8 pg/g			8.2 pg/g	
OCDF	350 pg/g			290 pg/g	
Dioxins					
TCDDs (total)	76 pg/g			88 pg/g	
2,3,7,8-TCDD	52 pg/g			54 pg/g	
PeCDDs (total)	13 pg/g			17 pg/g	
1,2,3,7,8-PeCDD	ND pg/g		2	ND pg/g	2.2
HxCDDs (total)	130 pg/g			140 pg/g	
1,2,3,4,7,8-HxCDD	2.9 pg/g			3.1 pg/g	
1,2,3,6,7,8-HxCDD	12 pg/g			12 pg/g	
1,2,3,7,8,9-HxCDD	10 pg/g			11 pg/g	
HpCDDs (total)	400 pg/g			400 pg/g	
1,2,3,4,6,7,8-HpCDD	180 pg/g			170 pg/g	
OCDD	1,800 pg/g			1,700 pg/g	
TEQ (Calculated)	**80.34 pg/g**			**77.63 pg/g**	

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

SOLIDS	**RUN V1**					
Sample ID:	**RAW-V1-SL-01**		**PSD-V1-SL-02**		**PAQ-V1-SL-01**	
Receiving Date	3/18/99		3/18/99		3/18/99	
Sample Date	3/16/99		3/16/99		3/16/99	
Extraction Date	3/23/99		3/23/99		3/23/99	
Analysis Date:	4/1/99		4/1/99		4/1/99	
Matrix	Solid		Solid		Solid	
Analyte	Result	DL	Result	DL	Result	DL
Furans						
TCDFs (total)	420 pg/g		210 pg/g		350 pg/g	
2,3,7,8-TCDF	21 pg/g g		9.5 pg/g g		16 pg/g g	
PeCDFs (total)	430 pg/g		230 pg/g		330 pg/g	
1,2,3,7,8-PeCDF	14 pg/g		6.9 pg/g		11 pg/g	
2,3,4,7,8-PeCDF	25 pg/g		17 pg/g		19 pg/g	
HxCDFs (total)	480 pg/g		250 pg/g		300 pg/g	
1,2,3,4,7,8-HxCDF	170 pg/g		160 pg/g		91 pg/g	
1,2,3,6,7,8-HxCDF	ND pg/g v	38	24 pg/g		22 pg/g	
2,3,4,6,7,8-HxCDF	13 pg/g		8.9 pg/g		9.6 pg/g	
1,2,3,7,8,9-HxCDF	ND pg/g	0.56	ND pg/g	0.34	ND pg/g	0.81
HpCDFs (total)	830 pg/g		560 pg/g		340 pg/g	
1,2,3,4,6,7,8-HpCDF	630 pg/g		450 pg/g		300 pg/g	
1,2,3,4,7,8,9-HpCDF	22 pg/g		19 pg/g		12 pg/g	
OCDF	990 pg/g		770 pg/g		430 pg/g	
Dioxins						
TCDDs (total)	170 pg/g		84 pg/g		110 pg/g	
2,3,7,8-TCDD	130 pg/g		64 pg/g		75 pg/g	
PeCDDs (total)	27 pg/g		12 pg/g		17 pg/g	
1,2,3,7,8-PeCDD	4.3 pg/g		ND pg/g	1.8	2.9 pg/g J	
HxCDDs (total)	240 pg/g		94 pg/g		170 pg/g	
1,2,3,4,7,8-HxCDD	5 pg/g		ND pg/g	2.4	3.5 pg/g J	
1,2,3,6,7,8-HxCDD	22 pg/g		8.8 pg/g		15 pg/g	
1,2,3,7,8,9-HxCDD	18 pg/g		7.4 pg/g		13 pg/g	
HpCDDs (total)	810 pg/g		250 pg/g		540 pg/g	
1,2,3,4,6,7,8-HpCDD	340 pg/g		100 pg/g		220 pg/g	
OCDD	3,500 pg/g		850 pg/g		2,200 pg/g	
TEQ (Calculated)	**184.66 pg/g**		**102.02 pg/g**		**111.46 pg/g**	

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

AQUEOUS	**RUN V1**									
Sample ID:	**RAW-V1-AQ-01**		**PSD-V1-AQ-01**		**PAQ-V1-AQ-01**		**PAQ-V1-AQ-02**		**PAQ-V1-AQ-02 Dup**	
Receiving Date	3/18/99		NA		3/18/99		3/18/99		3/18/99	
Sample Date	3/16/99		NA		3/16/99		3/16/99		3/16/99	
Extraction Date	3/23/99		NA		3/23/99		3/23/99		3/23/99	
Analysis Date:	3/30/99		NA		3/30/99		3/30/99		3/30/99	
Matrix	Aqueous		NA		Aqueous		Aqueous		Aqueous	
Analyte	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL
Furans										
TCDFs (total)	33,000 pg/L		NA		7,300 pg/L		6,800 pg/L		6,100 pg/L	
2,3,7,8-TCDF	1,300 pg/L g		NA		310 pg/L g		270 pg/L g		250 pg/L g	
PeCDFs (total)	27,000 pg/L		NA		6,200 pg/L		5,700 pg/L		5,300 pg/L	
1,2,3,7,8-PeCDF	890 pg/L		NA		230 pg/L		200 pg/L		190 pg/L	
2,3,4,7,8-PeCDF	1,600 pg/L		NA		390 pg/L		360 pg/L		320 pg/L	
HxCDFs (total)	31,000 pg/L		NA		7,400 pg/L		7,100 pg/L		6,300 pg/L	
1,2,3,4,7,8-HxCDF	4,800 pg/L		NA		1,500 pg/L		1,100 pg/L		1,100 pg/L	
1,2,3,6,7,8-HxCDF	2,100 pg/L		NA		530 pg/L		520 pg/L		460 pg/L	
2,3,4,6,7,8-HxCDF	990 pg/L		NA		240 pg/L		240 pg/L		220 pg/L	
1,2,3,7,8,9-HxCDF	55 pg/L		NA		ND pg/L	12	ND pg/L	12	ND pg/L	15
HpCDFs (total)	60,000 pg/L		NA		14,000 pg/L		14,000 pg/L		13,000 pg/L	
1,2,3,4,6,7,8-HpCDF	44,000 pg/L		NA		11,000 pg/L		10,000 pg/L		9,500 pg/L	
1,2,3,4,7,8,9-HpCDF	1,300 pg/L		NA		310 pg/L		320 pg/L		290 pg/L	
OCDF	64,000 pg/L		NA		14,000 pg/L		15,000 pg/L		12,000 pg/L	
Dioxins			NA							
TCDDs (total)	12,000 pg/L		NA		2,400 pg/L		2,300 pg/L		2,100 pg/L	
2,3,7,8-TCDD	7,000 pg/L		NA		1,500 pg/L		1,500 pg/L		1,300 pg/L	
PeCDDs (total)	1,900 pg/L		NA		470 pg/L		490 pg/L		370 pg/L	
1,2,3,7,8-PeCDD	310 pg/L		NA		68 pg/L		65 pg/L		59 pg/L	
HxCDDs (total)	21,000 pg/L		NA		4,300 pg/L		4,100 pg/L		3,800 pg/L	
1,2,3,4,7,8-HxCDD	640 pg/L		NA		93 pg/L		83 pg/L		85 pg/L	
1,2,3,6,7,8-HxCDD	2,000 pg/L		NA		420 pg/L		410 pg/L		400 pg/L	
1,2,3,7,8,9-HxCDD	1,600 pg/L		NA		370 pg/L		350 pg/L		300 pg/L	
HpCDDs (total)	62,000 pg/L		NA		13,000 pg/L		14,000 pg/L		12,000 pg/L	
1,2,3,4,6,7,8-HpCDD	27,000 pg/L		NA		6,100 pg/L		6,400 pg/L		5,600 pg/L	
OCDD	260,000 pg/L		NA		68,000 pg/L		72,000 pg/L		61,000 pg/L	
TEQ (Calculated)	**10,395 pg/L**		**NA**		**2,343 pg/L**		**2,274 pg/L**		**2,007 pg/L**	

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

SEDIMENTS	**RUN V2**		
Sample ID:	**RAW-V2-SD-01**		
Receiving Date	3/23/99		
Sample Date	3/16/99		
Extraction Date	3/23/99		
Analysis Date:	4/29/99		
Matrix	Solid		
Analyte	Result		DL
Furans			
TCDFs (total)	140	pg/g	
2,3,7,8-TCDF	5.3	pg/g g	
PeCDFs (total)	120	pg/g	
1,2,3,7,8-PeCDF	3.6	pg/g j	
2,3,4,7,8-PeCDF	7	pg/g	
HxCDFs (total)	100	pg/g	
1,2,3,4,7,8-HxCDF	30	pg/g	
1,2,3,6,7,8-HxCDF	8.4	pg/g	
2,3,4,6,7,8-HxCDF	ND	pg/g	2.2
1,2,3,7,8,9-HxCDF	ND	pg/g	1.2
HpCDFs (total)	170	pg/g	
1,2,3,4,6,7,8-HpCDF	120	pg/g	
1,2,3,4,7,8,9-HpCDF	4.4	pg/g j	
OCDF	180	pg/g	
Dioxins			
TCDDs (total)	55	pg/g	
2,3,7,8-TCDD	37	pg/g	
PeCDDs (total)	2.8	pg/g	
1,2,3,7,8-PeCDD	ND	pg/g	1.1
HxCDDs (total)	60	pg/g	
1,2,3,4,7,8-HxCDD	ND	pg/g	1.4
1,2,3,6,7,8-HxCDD	6	pg/g	
1,2,3,7,8,9-HxCDD	4.2	pg/g j	
HpCDDs (total)	210	pg/g	
1,2,3,4,6,7,8-HpCDD	93	pg/g	
OCDD	930	pg/g	
TEQ (Calculated)	**49.35**	**pg/g**	

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

SOLIDS	**RUN V2**					
Sample ID:	**RAW-V2-SL-01**		**PSD-V2-SL-01**		**PAQ-V2-SL-01**	
Receiving Date	3/18/99		3/18/99		3/18/99	
Sample Date	3/16/99		3/16/99		3/16/99	
Extraction Date	3/23/99		3/23/99		3/23/99	
Analysis Date:	4/1/99		4/1/99		4/1/99	
Matrix	Solid		Solid		Solid	
Analyte	Result	DL	Result	DL	Result	DL
Furans						
TCDFs (total)	250 pg/g		200 pg/g		360 pg/g	
2,3,7,8-TCDF	13 pg/g g		9.2 pg/g g		17 pg/g g	
PeCDFs (total)	230 pg/g		170 pg/g		340 pg/g	
1,2,3,7,8-PeCDF	8.4 pg/g		5.5 pg/g		11 pg/g	
2,3,4,7,8-PeCDF	14 pg/g		11 pg/g		19 pg/g	
HxCDFs (total)	240 pg/g		160 pg/g		280 pg/g	
1,2,3,4,7,8-HxCDF	79 pg/g		58 pg/g		97 pg/g	
1,2,3,6,7,8-HxCDF	18 pg/g		12 pg/g		ND pg/g V	22
2,3,4,6,7,8-HxCDF	7.6 pg/g		5.1 pg/g		9.2 pg/g	
1,2,3,7,8,9-HxCDF	ND pg/g	0.59	ND pg/g	0.21	ND pg/g	0.44
HpCDFs (total)	390 pg/g		250 pg/g		470 pg/g	
1,2,3,4,6,7,8-HpCDF	280 pg/g		180 pg/g		320 pg/g	
1,2,3,4,7,8,9-HpCDF	10 pg/g		7.4 pg/g		13 pg/g	
OCDF	410 pg/g		280 pg/g		440 pg/g	
Dioxins						
TCDDs (total)	97 pg/g		74 pg/g		120 pg/g	
2,3,7,8-TCDD	69 pg/g		56 pg/g		83 pg/g	
PeCDDs (total)	15 pg/g		7.9 pg/g		20 pg/g	
1,2,3,7,8-PeCDD	2.6 pg/g J		ND pg/g	1.5	3 pg/g	
HxCDDs (total)	130 pg/g		92 pg/g		190 pg/g	
1,2,3,4,7,8-HxCDD	3 pg/g J		ND pg/g	2.3	4.2 pg/g	
1,2,3,6,7,8-HxCDD	12 pg/g		8.8 pg/g		17 pg/g	
1,2,3,7,8,9-HxCDD	10 pg/g		7.2 pg/g		14 pg/g	
HpCDDs (total)	430 pg/g		260 pg/g		570 pg/g	
1,2,3,4,6,7,8-HpCDD	180 pg/g		100 pg/g		240 pg/g	
OCDD	1,900 pg/g		810 pg/g		2,400 pg/g	
TEQ (Calculated)	**98.99 pg/g**		**75.77 pg/g**		**118.96 pg/g**	

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

AQUEOUS	**RUN V2**					
Sample ID:	**RAW-V2-AQ-01**		**PSD-V2-AQ-01**		**PAQ-V2-AQ-01**	
Receiving Date	3/18/99		NA		3/18/99	
Sample Date	3/16/99		NA		3/16/99	
Extraction Date	3/23/99		NA		3/23/99	
Analysis Date:	3/30/99		NA		3/30/99	
Matrix	Aqueous		NA		Aqueous	
Analyte	Result	DL	Result	DL	Result	DL
Furans						
TCDFs (total)	32,000 pg/L		NA		470 pg/L	
2,3,7,8-TCDF	1,200 pg/L g		NA		ND pg/L Gv	15
PeCDFs (total)	31,000 pg/L		NA		250 pg/L	
1,2,3,7,8-PeCDF	1,000 pg/L		NA		ND pg/L	12
2,3,4,7,8-PeCDF	1,900 pg/L		NA		ND pg/L	21
HxCDFs (total)	39,000 pg/L		NA		410 pg/L	
1,2,3,4,7,8-HxCDF	8,200 pg/L		NA		140 pg/L	
1,2,3,6,7,8-HxCDF	1,100 pg/L		NA		31 pg/L J	
2,3,4,6,7,8-HxCDF	1,200 pg/L		NA		ND pg/L	15
1,2,3,7,8,9-HxCDF	48 pg/L		NA		ND pg/L	11
HpCDFs (total)	83,000 pg/L		NA		800 pg/L	
1,2,3,4,6,7,8-HpCDF	57,000 pg/L		NA		630 pg/L	
1,2,3,4,7,8,9-HpCDF	1,600 pg/L		NA		ND pg/L	19
OCDF	82,000 pg/L		NA		800 pg/L	
Dioxins			NA			
TCDDs (total)	11,000 pg/L		NA		140 pg/L	
2,3,7,8-TCDD	6,700 pg/L		NA		81 pg/L	
PeCDDs (total)	3,600 pg/L		NA		ND pg/L	17
1,2,3,7,8-PeCDD	330 pg/L		NA		ND pg/L	7.1
HxCDDs (total)	21,000 pg/L		NA		150 pg/L	
1,2,3,4,7,8-HxCDD	420 pg/L		NA		ND pg/L	7.9
1,2,3,6,7,8-HxCDD	2,200 pg/L		NA		ND pg/L	27
1,2,3,7,8,9-HxCDD	1,600 pg/L		NA		ND pg/L	19
HpCDDs (total)	68,000 pg/L		NA		750 pg/L	
1,2,3,4,6,7,8-HpCDD	29,000 pg/L		NA		350 pg/L	
OCDD	330,000 pg/L		NA		3,500 pg/L	
TEQ (Calculated)	**10,750 pg/L**		**NA**		**112 pg/L**	

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

SEDIMENTS	**RUN V3**			
Sample ID:	**RAW-V3-SD-01**		**CBK-V3-SD-01**	
Receiving Date	3/23/99		3/20/99	
Sample Date	3/16/99		3/17/99	
Extraction Date	3/23/99		3/23/99	
Analysis Date:	4/25/99		4/29/99	
Matrix	Solid		Solid	
Analyte	Result	DL	Result	DL
Furans				
TCDFs (total)	130 pg/g		ND pg/L	0.38
2,3,7,8-TCDF	5.8 pg/g g		ND pg/L	0.38
PeCDFs (total)	110 pg/g		ND pg/L	0.5
1,2,3,7,8-PeCDF	3.6 pg/g j		ND pg/L	0.49
2,3,4,7,8-PeCDF	5.8 pg/g		ND pg/L	0.5
HxCDFs (total)	120 pg/g		ND pg/L	1.1
1,2,3,4,7,8-HxCDF	36 pg/g		ND pg/L	1.0
1,2,3,6,7,8-HxCDF	9.4 pg/g		ND pg/L	0.98
2,3,4,6,7,8-HxCDF	ND pg/g	2	ND pg/L	1.1
1,2,3,7,8,9-HxCDF	ND pg/g	2.2	ND pg/L	1.4
HpCDFs (total)	190 pg/g		ND pg/L	0.48
1,2,3,4,6,7,8-HpCDF	140 pg/g		ND pg/L	0.35
1,2,3,4,7,8,9-HpCDF	ND pg/g	1.5	ND pg/L	0.48
OCDF	200 pg/g		ND pg/L	1.2
Dioxins				
TCDDs (total)	48 pg/g		ND pg/L	0.42
2,3,7,8-TCDD	28 pg/g		ND pg/L	0.42
PeCDDs (total)	3.5 pg/g		ND pg/L	0.72
1,2,3,7,8-PeCDD	ND pg/g	2.2	ND pg/L	0.72
HxCDDs (total)	110 pg/g		ND pg/L	1.8
1,2,3,4,7,8-HxCDD	ND pg/g	2.8	ND pg/L	1.8
1,2,3,6,7,8-HxCDD	5.6 pg/g		ND pg/L	1.6
1,2,3,7,8,9-HxCDD	8.8 pg/g		ND pg/L	1.7
HpCDDs (total)	370 pg/g		ND pg/L	0.43
1,2,3,4,6,7,8-HpCDD	110 pg/g		ND pg/L	0.43
OCDD	1,000 pg/g		ND pg/L	1.6
TEQ (Calculated)	**41.34 pg/g**		**0.00 pg/g**	

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

SOLIDS	**RUN V3**					
Sample ID:	**RAW-V3-SL-01**		**PSD-V3-SL-01**		**PAQ-V3-SL-01**	
Receiving Date	3/18/99		3/20/99		3/20/99	
Sample Date	3/16/99		3/17/99		3/17/99	
Extraction Date	3/23/99		3/23/99		3/23/99	
Analysis Date:	4/1/99		4/25/99		4/25/99	
Matrix	Solid		Solid		Solid	
Analyte	Result	DL	Result	DL	Result	DL
Furans						
TCDFs (total)	270 pg/g		210 pg/g		390 pg/g	
2,3,7,8-TCDF	13 pg/g g		9.6 pg/g g		18 pg/g g	
PeCDFs (total)	180 pg/g		180 pg/g		350 pg/g	
1,2,3,7,8-PeCDF	8.2 pg/g		5.6 pg/g		11 pg/g	
2,3,4,7,8-PeCDF	14 pg/g		11 pg/g		20 pg/g	
HxCDFs (total)	210 pg/g		170 pg/g		320 pg/g	
1,2,3,4,7,8-HxCDF	75 pg/g		61 pg/g		100 pg/g	
1,2,3,6,7,8-HxCDF	ND pg/g V	16	13 pg/g		24 pg/g	
2,3,4,6,7,8-HxCDF	7 pg/g		3.9 pg/g J		6.8 pg/g	
1,2,3,7,8,9-HxCDF	ND pg/g	0.56	ND pg/g	0.93	ND pg/g	2.0
HpCDFs (total)	340 pg/g		270 pg/g		520 pg/g	
1,2,3,4,6,7,8-HpCDF	240 pg/g		190 pg/g		360 pg/g	
1,2,3,4,7,8,9-HpCDF	11 pg/g		8.3 pg/g		14 pg/g	
OCDF	360 pg/g		320 pg/g		520 pg/g	
Dioxins						
TCDDs (total)	460 pg/g		72 pg/g		130 pg/g	
2,3,7,8-TCDD	75 pg/g		50 pg/g		88 pg/g	
PeCDDs (total)	13 pg/g		10 pg/g		24 pg/g	
1,2,3,7,8-PeCDD	ND pg/g	2.4	ND pg/g	1.6	3.1 pg/g J	
HxCDDs (total)	130 pg/g		87 pg/g		190 pg/g	
1,2,3,4,7,8-HxCDD	3 pg/g		ND pg/g	1.6	3.4 pg/g J	
1,2,3,6,7,8-HxCDD	12 pg/g		7.6 pg/g		17 pg/g	
1,2,3,7,8,9-HxCDD	9.9 pg/g		6 pg/g		12 pg/g	
HpCDDs (total)	370 pg/g		280 pg/g		610 pg/g	
1,2,3,4,6,7,8-HpCDD	150 pg/g		110 pg/g		260 pg/g	
OCDD	1,400 pg/g		920 pg/g		2,500 pg/g	
TEQ (Calculated)	**100.17 pg/g**		**70.21 pg/g**		**127.58 pg/g**	

Table D-8
BioGenesis Demonstration Project
Validation Test Runs
Verification Test Runs
Dioxin/Furan Data

AQUEOUS	**RUN V3**									
Sample ID:	**RAW-V3-AQ-01**		**PSD-V3-AQ-01**		**PAQ-V3-AQ-01**		**PSW-V3-AQ-01**		**FBK-V3-AQ-02**	
Receiving Date	3/20/99		NA		3/20/99		3/20/99		3/20/99	
Sample Date	3/17/99		NA		3/17/99		3/18/99		3/18/99	
Extraction Date	3/23/99		NA		3/23/99		3/23/99		3/23/99	
Analysis Date:	3/30/99		NA		4/29/99		4/29/99		4/29/99	
Matrix	Aqueous		NA		Aqueous		Aqueous		Aqueous	
Analyte	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL
Furans										
TCDFs (total)	40,000 pg/L		NA		1,300 pg/L		ND pg/L	3.7	ND pg/L	3.1
2,3,7,8-TCDF	1,400 pg/L g		NA		45 pg/L g		ND pg/L	3.7	ND pg/L	3.1
PeCDFs (total)	37,000 pg/L		NA		1,100 pg/L		ND pg/L	5.3	ND pg/L	4.8
1,2,3,7,8-PeCDF	1,200 pg/L		NA		31 pg/L J		ND pg/L	5.2	ND pg/L	4.7
2,3,4,7,8-PeCDF	2,400 pg/L		NA		61 pg/L		ND pg/L	5.3	ND pg/L	4.8
HxCDFs (total)	43,000 pg/L		NA		1,000 pg/L		ND pg/L	9.7	ND pg/L	9.9
1,2,3,4,7,8-HxCDF	11,000 pg/L		NA		340 pg/L		ND pg/L	7.1	ND pg/L	7.3
1,2,3,6,7,8-HxCDF	2,100 pg/L		NA		84 pg/L		ND pg/L	6.8	ND pg/L	7.0
2,3,4,6,7,8-HxCDF	750 pg/L		NA		ND pg/L	24	ND pg/L	7.9	ND pg/L	8.1
1,2,3,7,8,9-HxCDF	78 pg/L		NA		ND pg/L	20	ND pg/L	9.7	ND pg/L	9.9
HpCDFs (total)	73,000 pg/L		NA		1,900 pg/L		ND pg/L	5.9	ND pg/L	7.0
1,2,3,4,6,7,8-HpCDF	54,000 pg/L E		NA		1,300 pg/L		ND pg/L	4.3	ND pg/L	5.1
1,2,3,4,7,8,9-HpCDF	1,500 pg/L		NA		42 pg/L J		ND pg/L	5.9	ND pg/L	7.0
OCDF	78,000 pg/L E		NA		1,800 pg/L		ND pg/L	8.8	ND pg/L	7.4
Dioxins			NA							
TCDDs (total)	14,000 pg/L		NA		360 pg/L		ND pg/L	6.3	ND pg/L	4.4
2,3,7,8-TCDD	9,200 pg/L E		NA		230 pg/L		ND pg/L	6.3	ND pg/L	4.4
PeCDDs (total)	4,500 pg/L		NA		26 pg/L		ND pg/L	6.6	ND pg/L	7.1
1,2,3,7,8-PeCDD	380 pg/L		NA		ND pg/L	8.7	ND pg/L	6.6	ND pg/L	7.1
HxCDDs (total)	32,000 pg/L		NA		500 pg/L		ND pg/L	13	ND pg/L	12
1,2,3,4,7,8-HxCDD	1,000 pg/L		NA		ND pg/L	12	ND pg/L	13	ND pg/L	12
1,2,3,6,7,8-HxCDD	2,400 pg/L		NA		51 pg/L		ND pg/L	11	ND pg/L	11
1,2,3,7,8,9-HxCDD	1,500 pg/L		NA		35 pg/L J		ND pg/L	12	ND pg/L	12
HpCDDs (total)	78,000 pg/L		NA		2,000 pg/L		ND pg/L	5.4	ND pg/L	5.2
1,2,3,4,6,7,8-HpCDD	33,000 pg/L E		NA		910 pg/L		ND pg/L	5.4	ND pg/L	5.2
OCDD	310,000 pg/L E		NA		8,500 pg/L		ND pg/L	12	ND pg/L	13
TEQ (Calculated)	**13,946 pg/L**		**NA**		**350 pg/L**		**0 pg/L**		**0 pg/L**	

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

SEDIMENTS	**RUN V1**											
Sample ID:	**RAW-V1-SD-01**		**RAW-V1-SD-02**		**RAW-V1-SD-02-DUP**		**CCO-V1-SD-01**		**PPO-V1-SD-01**		**PAQ-V1-SD-01**	
Receiving Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/18/99	
Sample Date:	3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
General Chemistry												
Percent Moisture	NA		NA		68.7 %		NA		NA		NA	
Extraction Date:					3/22/99							
Analysis Date:					3/23/99							
Percent Solids	31.3 %	1	32.3 %	1	33.9 %	1	31.3 %		26.7 %		5.4 %	
Receiving Date	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/18/99	
Extraction Date:	3/17/99		3/17/99		3/23/99		3/23/99		3/23/99		3/23/99	
Analysis Date:	3/18/99		3/18/99		3/24/99		3/24/99		3/24/99		3/24/99	
Percent Solids	32.3 %	1	31.3 %	1	NA		NA		NA		6.2 %	
Receiving Date	3/18/99		3/18/99								3/17/99	
Extraction Date:	3/22/99		3/22/99								3/23/99	
Analysis Date:	3/23/99		3/23/99								3/24/99	
pH (solid)	7.3 No Uni		7.3 No Uni		7.1 No Uni		7.8 No Uni		7.8 No Uni		7.6 No Uni	
Receiving Date	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/18/99	
Extraction Date:	3/17/99		3/17/99		4/7/99		3/17/99		3/17/99		3/20/99	
Analysis Date:	3/17/99		3/17/99		4/7/99		3/17/99		3/17/99		3/20/99	
pH (solid)	NA		NA		NA		NA		NA		7.2 No Uni	
Receiving Date											3/17/99	
Extraction Date:											3/19/99	
Analysis Date:											3/19/99	
Total Organic Carbon	34,100 mg/kg	236	29,300 mg/kg	208	29,100 mg/kg	189	NA		NA		NA	
Extraction Date:	4/7/99		4/7/99									
Analysis Date:	4/7/99		4/7/99									
Acid-insoluble Sulfide	1,360 mg/kg	160	1,190 mg/kg	155	1,180 mg/kg	148	NA		NA		NA	
Extraction Date:	3/23/99		3/23/99		3/23/99							
Analysis Date:	3/23/99		3/23/99		3/23/99							

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

SOLIDS	**RUN V1**															
Sample ID:	**RAW-V1-SL-01**		**PPO-V1-SL-01**		**CCO-V1-SL-01**		**OXO-V1-SL-01**		**PSD-V1-SL-01**		**PSD-V1-SL-02**		**PSD-V1-SL-02 DUP**		**PAQ-V1-SL-01**	
Receiving Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/18/99	
Sample Date:	3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
General Chemistry																
Percent Moisture	NA		NA		NA		NA		NA		NA		NA		NA	
Extraction Date:																
Analysis Date:																
Percent Solids	63.2 %	1	56.3 %	1	41.1 %	1	56.4 %	1	69.9 %	1	69.0 %	1	69.9 %		32.3 %	1
Receiving Date	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/18/99	
Extraction Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/22/99		3/19/99	
Analysis Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/23/99		3/20/99	
Percent Solids	58.7 %		59.4 %		55.9 %		65.7 %		NA		70.2 %		70.0 %		NA	
Receiving Date	3/18/99		3/18/99		3/18/99		3/18/99				3/18/99		3/18/99			
Extraction Date:	3/25/99		3/22/99		3/22/99		3/22/99				3/22/99		3/22/99			
Analysis Date:	3/26/99		3/23/99		3/23/99		3/23/99				3/23/99		3/23/99			
pH (solid)	7.4 No Uni		NA		NA		NA		7.6 No Uni		7.6 No Uni		7.7 No Uni		7.4 No Uni	
Receiving Date	3/17/99								3/17/99		3/17/99		4/2/99		3/19/99	
Extraction Date:	3/17/99								3/17/99		3/17/99		4/2/99		3/19/99	
Analysis Date:	3/17/99															
pH (solid)	NA		NA		NA		NA		NA		NA		NA		NA	
Receiving Date																
Extraction Date:																
Analysis Date:																
Total Organic Carbon	32,700 mg/kg	363	35,400 mg/kg	352	33,700 mg/kg	370	36,700 mg/kg	262	12,400 mg/kg	125	12,000 mg/kg	107	13,600 mg/kg	120	42,500 mg/kg	319
Extraction Date:	4/7/99		4/7/99		4/7/99		4/7/99		4/7/99		4/7/99		4/7/99		4/7/99	
Analysis Date:	4/7/99		4/7/99		4/7/99		4/7/99		4/7/99		4/7/99		4/7/99		4/7/99	
Acid-insoluble Sulfide	225 mg/kg	79.2	NA		NA		NA		ND mg/kg	71.6	ND mg/kg	72.5	ND mg/kg	71.5	ND mg/kg	155
Extraction Date:	3/23/99								3/23/99		3/23/99		3/23/99		3/22/99	
Analysis Date:	3/23/99								3/23/99		3/23/99		3/23/99		3/22/99	

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

AQUEOUS	RUN V1															
Sample ID:	**RAW-V1-AQ-01**		**PPO-V1-AQ-01**		**CCO-V1-AQ-01**		**OXO-V1-AQ-01**		**PAQ-V1-AQ-01**		**PAQ-V1-AQ-02**		**PAQ-V1-AQ-02-DUP**		**RAW-V1-AQ-03**	
Receiving Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/18/99		3/18/99		3/18/99		4/17/99	
Sample Date:	3/16/99		3/16/99		3/16/99		3/16/99		3/16/99		3/16/99				3/16/99	
Matrix:	WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
General Chemistry																
Biochemical Oxygen Demand	NA		NA		NA		NA		75 mg/L	2	138 mg/L	2	234 mg/L	2	NA	
Extraction Date:									3/19/99		3/19/99		3/19/99			
Analysis Date:									3/24/99		3/24/99		3/24/99			
Chemical Oxygen Demand (COD)	NA		NA		NA		NA		866 mg/L	50	1070 mg/L	50	1160 mg/L		NA	
Extraction Date:									4/1/99		4/1/99		4/1/99			
Analysis Date:									4/1/99		4/1/99		4/1/99			
pH (liquid)	NA		NA		NA		NA				7.1 No Uni		7.1 No Uni		NA	
Extraction Date:											4/2/99		36252			
Analysis Date:											4/2/99		36252			
Surfactants	NA		NA		NA		NA		0.59 mg/L	0.4	ND mg/L	0.4	ND mg/L	0.4	NA	
Extraction Date:									3/19/99		3/19/99		3/19/99			
Analysis Date:									3/19/99		3/19/99		3/19/99			
Total Dissolved Solids	NA		NA		NA		NA		3500 mg/L	33	7280 mg/L	50	5590 mg/L	550	NA	
Extraction Date:																
Analysis Date:																
Total Kjeldahl Nitrogen	NA		NA		NA		NA		63.7 mg/L	1	57.7 mg/L	1	49.6 mg/L	1	NA	
Extraction Date:									3/22-3/23/99		3/22-3/23/99		3/22-3/23/99			
Analysis Date:									4/7/99		4/7/99		4/7/99			
Total Organic Carbon	NA		400 mg/L	8	209 mg/L	16	624 mg/L	16	275 mg/L	8	232 mg/L	8	240 mg/L	8	74.4 mg/L	10
Extraction Date:			3/30/99		3/30/99		3/30/99		3/30/99		4/1/99		4/1/99		4/21/99	
Analysis Date:			3/30/99		3/30/99		3/30/99		3/30/99		4/1/99		4/1/99		4/21/99	
Total phosphorus	NA		NA		NA		NA		6 mg/L	1	5.3 mg/L	1	6.5 mg/L	1	NA	
Extraction Date:									4/7/99		3/19/99		4/7/99			
Analysis Date:									4/9/99		3/19/99		4/9/99			
Total Suspended Solids	516 mg/L	4	756 mg/L	4	104 mg/L	4	976 mg/L	4	1340 mg/L	4	910 mg/L	20	7.5 mg/L	20	NA	
Extraction Date:	3/24/99		3/24/99		3/24/99		3/24/99		3/24/99		3/22/99		3/22/99			
Analysis Date:	3/25/99		3/25/99		3/25/99		3/25/99		3/25/99		3/23/99		3/23/99			
Total Suspended Solids	NA		NA		NA		NA		860 mg/L	13.2	NA		NA		NA	
Extraction Date:									3/22/99							
Analysis Date:									3/23/99							

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

SEDIMENTS	**RUN V2**									
Sample ID:	**RAW-V2-SD-01**		**PAQ-V2-SD-01**		**CCO-V2-SD-01**		**PPO-V2-SD-01**		**OXO-V2-SD-01**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Sample Date:	3/16/99		3/17/99		3/17/99		3/17/99		3/17/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
General Chemistry										
Percent Moisture	NA		NA		NA		NA		NA	
Extraction Date:										
Analysis Date:										
Percent Solids	32 %	1	5.1 %		30.4 %		44.1 %		27.9 %	
Receiving Date	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Extraction Date:	3/19/99		3/23/99		3/23/99		3/23/99		3/23/99	
Analysis Date:	3/20/99		3/24/99		3/24/99		3/24/99		3/24/99	
Percent Solids	38.2 %		4.7 %		NA		NA		NA	
Receiving Date	36237		36237							
Extraction Date:	3/30/99		3/23/99							
Analysis Date:	4/2/99		3/24/99							
pH (solid)	7.1 No Uni		7.4 No Uni		7.6 No Uni		7.8 No Uni		6.9 No Uni	
Receiving Date	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Extraction Date:	3/19/99		3/20/99		3/19/99		3/19/99		3/19/99	
Analysis Date:	3/19/99		3/20/99		3/19/99		3/19/99		3/19/99	
pH (solid)	NA		6.9 No Uni		NA		NA		NA	
Receiving Date			3/18/99							
Extraction Date:			3/19/99							
Analysis Date:			3/19/99							
Total Organic Carbon	16,100 mg/kg	230	NA		NA		9,520 mg/kg	191	NA	
Extraction Date:	4/7/99						3/22/99			
Analysis Date:	4/7/99						3/22/99			
Acid-insoluble Sulfide	ND mg/kg	131	NA		NA		ND mg/kg	113	NA	
Extraction Date:	3/22/99						3/22/99			
Analysis Date:	3/22/99									

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

SOLIDS	**RUN V2**											
Sample ID:	**RAW-V2-SL-01**		**PPO-V2-SL-01**		**CCO-V2-SL-01**		**OXO-V2-SL-01**		**PSD-V2-SL-01**		**PAQ-V2-SL-01**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Sample Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL	Result	LDL
General Chemistry												
Percent Moisture	NA		NA		NA		NA		NA		NA	
Extraction Date:												
Analysis Date:												
Percent Solids	57.9 %	1	58.6 %	1	50.2 %	1	61.4 %	1	71.8 %	1	32.9 %	1
Receiving Date	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Extraction Date:	3/19/99		3/19/99		3/19/99		3/19/99		3/19/99		3/19/99	
Analysis Date:	3/20/99		3/20/99		3/20/99		3/20/99		3/20/99		3/20/99	
Percent Solids	NA		NA		NA		NA		NA		NA	
Receiving Date												
Extraction Date:												
Analysis Date:												
pH (solid)	7.3 No Uni		NA		NA		NA		7.6 No Uni		7.4 No Uni	
Receiving Date	3/18/99								3/18/99		3/18/99	
Extraction Date:	3/19/99								3/19/99		3/19/99	
Analysis Date:	36238								36238		3/19/99	
pH (solid)	NA		NA		NA		NA		NA		NA	
Receiving Date												
Extraction Date:												
Analysis Date:												
Total Organic Carbon	21,100 mg/kg	143	17,300 mg/kg	133	22,100 mg/kg	163	11,800 mg/kg	142	7,510 mg/kg	79	37,400 mg/kg	261
Extraction Date:	4/7/99		4/8/99		4/8/99		4/8/99		4/8/99		4/8/99	
Analysis Date:	4/7/99		4/8/99		4/8/99		4/8/99		4/8/99		4/8/99	
Acid-insoluble Sulfide	ND mg/kg	86.4	NA		NA		NA		ND mg/kg	69.6	ND mg/kg	152
Extraction Date:	3/22/99								3/22/99		3/22/99	
Analysis Date:	3/22/99								3/22/99		3/22/99	

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

AQUEOUS	RUN V2											
Sample ID:	**RAW-V2-AQ-01**		**PPO-V2-AQ-01**		**CCO-V2-AQ-01**		**OXO-V2-AQ-01**		**PAQ-V2-AQ-01**		**RAW-V2-AQ-03**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		4/17/99	
Sample Date:	3/16/99		3/17/99		3/17/99		3/17/99		3/17/99		3/16/99	
Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
Analyte	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL
General Chemistry												
Biochemical Oxygen Demand	NA		NA		NA		NA		3.6 mg/L	2	NA	
Extraction Date:												
Analysis Date:												
Chemical Oxygen Demand (COD)	NA		NA		NA		NA		702 mg/L	50	NA	
Extraction Date:												
Analysis Date:												
pH (liquid)	7.5 No Uni		NA		NA		NA		7.2 No Uni		NA	
Extraction Date:	4/2/99								4/2/99			
Analysis Date:	4/2/99								4/2/99			
Surfactants	NA		NA		NA		NA		ND mg/L	0.4	NA	
Extraction Date:												
Analysis Date:												
Total Dissolved Solids			NA		NA		NA		5600 mg/L	50	NA	
Extraction Date:												
Analysis Date:												
Total Kjeldahl Nitrogen	NA		NA		NA		NA		42.7 mg/L	1	NA	
Extraction Date:												
Analysis Date:												
Total Organic Carbon	NA		NA		194 mg/L	8	208 mg/L	16	180 mg/L	8	76.4 mg/L	10
Extraction Date:					3/30/99		4/1/99				4/21/99	
Analysis Date:					3/30/99		4/1/99				4/21/99	
Total phosphorus	NA		NA		NA		NA		4.2 mg/L	0.5	NA	
Extraction Date:												
Analysis Date:												
Total Suspended Solids	480 mg/L	4	548 mg/L	4	652 mg/L	4	1380 mg/L	4	3130 mg/L	40	NA	
Extraction Date:	3/24/99		3/24/99		3/24/99		3/24/99		3/24/99			
Analysis Date:	3/25/99		3/25/99		3/25/99		3/25/99		3/25/99			
Total Suspended Solids	NA		NA		NA		NA		1500 mg/L	4	NA	
Extraction Date:									3/24/99			
Analysis Date:									3/25/99			

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

SEDIMENTS	RUN V3											
Sample ID:	**RAW-V3-SD-01**		**CBK-V3-SD-01**		**CCO-V3-SD-01**		**PAQ-V3-SD-01**		**PPO-V3-SD-01**		**OXO-V3-SD-**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Sample Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	
General Chemistry												
Percent Moisture	NA		NA		NA		NA		NA		NA	
Extraction Date:												
Analysis Date:												
Percent Solids	32 %	1	31.4 %		31 %		8.2 %		32.7 %		39.8 %	
Receiving Date	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Extraction Date:	3/19/99		3/22/99		3/23/99		3/23/99		3/23/99		3/23/99	
Analysis Date:	3/20/99		3/23/99		3/24/99		3/24/99		3/24/99		3/24/99	
Percent Solids	NA		43 %		NA		NA		NA		NA	
Receiving Date			3/19/99									
Extraction Date:			3/23/99									
Analysis Date:			3/24/99									
pH (solid)	7.2 No Uni		6.7 No Uni		7.8 No Uni		7.2 No Uni		7.6 No Uni		7.1 No Uni	
Receiving Date	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Extraction Date:	3/19/99		3/18/99		3/19/99		3/19/99		3/19/99		3/19/99	
Analysis Date:	3/19/99		3/18/99		3/19/99		3/19/99		3/19/99		3/19/99	
pH (solid)	NA		NA		NA		NA		NA		NA	
Receiving Date												
Extraction Date:												
Analysis Date:												
Total Organic Carbon	21,000 mg/kg	232	821 mg/kg	184	NA		NA		NA		NA	
Extraction Date:	4/7/99		4/8/99									
Analysis Date:	4/7/99		4/8/99									
Acid-insoluble Sulfide	ND mg/kg	138	ND mg/kg	116	NA		NA		NA		NA	
Extraction Date:	3/22/99		3/22/99									
Analysis Date:	3/22/99		3/22/99									

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

SOLIDS	RUN V3											
Sample ID:	**RAW-V3-SL-01**		**PPO-V3-SL-01**		**CCO-V3-SL-01**		**OXO-V3-SL-01**		**PSD-V3-SL-01**		**PAQ-V3-SL-**	
Receiving Date:	3/18/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
Sample Date:	3/17/99		3/17/99		3/17/99		3/17/99		3/17/99		3/17/99	
Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Analyte	Result	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	
General Chemistry												
Percent Moisture	NA		NA		NA		NA		NA		NA	
Extraction Date:												
Analysis Date:												
Percent Solids	59.1 %	1	66.5 %	1	67.3 %	1	60.9 %	1	67.8 %		31.2 %	
Receiving Date	3/18/99		3/18/99		3/18/99		3/18/99		3/19/99		3/19/99	
Extraction Date:	3/19/99		3/19/99		3/19/99		3/19/99		3/22/99		3/22/99	
Analysis Date:	3/20/99		3/20/99		3/20/99		3/20/99		3/23/99		3/23/99	
Percent Solids	NA		NA		NA		NA		66.6 %		31.8 %	
Receiving Date									3/18/99		3/18/99	
Extraction Date:									3/23/99		3/23/99	
Analysis Date:									3/24/99		3/24/99	
pH (solid)	7.4 No Uni		NA		NA		NA		7.7 No Uni		7.5 No Uni	
Receiving Date	3/18/99								3/18/99		3/18/99	
Extraction Date:	3/19/99								3/18/99		3/18/99	
Analysis Date:	3/19/99								3/18/99		3/18/99	
pH (solid)	NA		NA		NA		NA		NA		NA	
Receiving Date												
Extraction Date:												
Analysis Date:												
Total Organic Carbon	19000 mg/kg	130	14700 mg/kg	235	18200 mg/kg	254	14100 mg/kg	284	13600 mg/kg	114	8870 mg/kg	
Extraction Date:	4/8/99		4/8/99		4/8/99		4/8/99		4/8/99		4/8/99	
Analysis Date:	4/8/99		4/8/99		4/8/99		4/8/99		4/8/99		4/8/99	
Acid-insoluble Sulfide	ND mg/kg	84.7	NA		NA		NA		ND mg/kg	75.1	ND mg/kg	
Extraction Date:	3/22/99								3/22/99		3/22/99	
Analysis Date:	3/22/99								3/22/99		3/22/99	

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

AQUEOUS	RUN V3											
Sample ID:	**RAW-V3-AQ-01**		**PPO-V3-AQ-01**		**CCO-V3-AQ-01**		**OXO-V3-AQ-01**		**PAQ-V3-AQ-01**		**PSW-V3-AQ-**	
Receiving Date:	8/10/87		5/2/87		5/2/87		5/2/87		5/2/87		3/19/99	
Sample Date:	1/22/87		1/22/87		1/22/87		1/22/87		10/14/86		3/18/99	
Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
Analyte	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	LDL	Results	
General Chemistry												
Biochemical Oxygen Demand	NA		NA		NA		NA		182 mg/L	2	6 mg/L	
Extraction Date:									3/18/99		3/19/99	
Analysis Date:									3/23/99		3/24/99	
Chemical Oxygen Demand (COD)	NA		NA		NA		NA		763 mg/L	50	10.6 mg/L	
Extraction Date:									4/1/99		4/1/99	
Analysis Date:									4/1/99		4/2/99	
pH (liquid)	7.5 No Uni		NA		NA		NA		7.6 No Uni	0	7.6 No Uni	
Extraction Date:	3/22/99								3/22/99		3/22/99	
Analysis Date:	3/22/99								3/22/99		3/22/99	
Surfactants	NA		NA		NA		NA		0.95 mg/L	0.4	ND mg/L	
Extraction Date:									3/19/99		3/19/99	
Analysis Date:									3/19/99		3/19/99	
Total Dissolved Solids	NA		NA		NA		NA		7440 mg/L	50	171 mg/L	
Extraction Date:									3/22/99		3/24/99	
Analysis Date:									3/23/99		3/25/99	
Total Kjeldahl Nitrogen	NA		NA		NA		NA		67.8 mg/L	1	ND mg/L	
Extraction Date:									4/7/99		4/7/99	
Analysis Date:									4/7/99		4/7/99	
Total Organic Carbon	6.1 mg/L	8	443 mg/L	16	238 mg/L	8	311 mg/L	16	280 mg/L	16	1.9 mg/L	
Extraction Date:	4/1/99		4/1/99		4/1/99		4/1/99		4/1/99		3/28/99	
Analysis Date:	4/1/99		4/1/99		4/1/99		4/1/99		4/1/99		3/28/99	
Total phosphorus	NA		NA		NA		NA		ND mg/L	0.5	ND mg/L	
Extraction Date:									4/7/99		4/7/99	
Analysis Date:									4/9/99		4/9/99	
Total Suspended Solids	2070 mg/L	4	3140 mg/L	4	604 mg/L	4	1200 mg/L	4	2540 mg/L	20	ND mg/L	
Extraction Date:	3/24/99		3/24/99		3/24/99		3/24/99		3/22/99		3/24/99	
Analysis Date:	3/25/99		3/25/99		3/25/99		3/25/99		3/23/99		3/24/99	
Total Suspended Solids	NA		NA		NA		NA		524 mg/L	4	mg/L	
Extraction Date:									3/24/99			
Analysis Date:									3/25/99			

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

SEDIMENTS	
Sample ID:	**01**
Receiving Date:	
Sample Date:	
Matrix:	
Analyte	LDL
General Chemistry	
Percent Moisture	
Extraction Date:	
Analysis Date:	
Percent Solids	
Receiving Date	
Extraction Date:	
Analysis Date:	
Percent Solids	
Receiving Date	
Extraction Date:	
Analysis Date:	
pH (solid)	
Receiving Date	
Extraction Date:	
Analysis Date:	
pH (solid)	
Receiving Date	
Extraction Date:	
Analysis Date:	
Total Organic Carbon	
Extraction Date:	
Analysis Date:	
Acid-insoluble Sulfide	
Extraction Date:	
Analysis Date:	

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

SOLIDS	
Sample ID:	**01**
Receiving Date:	
Sample Date:	
Matrix:	
Analyte	LDL
General Chemistry	
Percent Moisture	
Extraction Date:	
Analysis Date:	
Percent Solids	
Receiving Date	
Extraction Date:	
Analysis Date:	
Percent Solids	
Receiving Date	
Extraction Date:	
Analysis Date:	
pH (solid)	
Receiving Date	
Extraction Date:	
Analysis Date:	
pH (solid)	
Receiving Date	
Extraction Date:	
Analysis Date:	
Total Organic Carbon	242
Extraction Date:	
Analysis Date:	
Acid-insoluble Sulfide	157
Extraction Date:	
Analysis Date:	

Table D-9
BioGenesis Demonstration Project
Validation Test Runs
General Chemistry

AQUEOUS				
Sample ID:	**01**	**FBK-V3-AQ-02**		
Receiving Date:		3/19/99		
Sample Date:				
Matrix:		WATER		
Analyte	LDL	Results		LDL
General Chemistry				
Biochemical Oxygen Demand	2	2.2	mg/L	2
Extraction Date:		3/19/99		
Analysis Date:		3/24/99		
Chemical Oxygen Demand (COD)	10	ND	mg/L	10
Extraction Date:		4/1/99		
Analysis Date:		4/2/99		
pH (liquid)		8.6	No Uni	
Extraction Date:		3/22/99		
Analysis Date:		3/22/99		
Surfactants	0.1	ND	mg/L	0.1
Extraction Date:		3/19/99		
Analysis Date:		3/19/99		
Total Dissolved Solids	10	ND	mg/L	10
Extraction Date:		3/24/99		
Analysis Date:		3/25/99		
Total Kjeldahl Nitrogen	1	ND	mg/L	1
Extraction Date:		4/7/99		
Analysis Date:		4/7/99		
Total Organic Carbon	1	0.88	mg/L B	1
Extraction Date:		3/29/99		
Analysis Date:		3/29/99		
Total phosphorus	0.1	ND	mg/L	0.1
Extraction Date:		4/7/99		
Analysis Date:		4/9/99		
Total Suspended Solids	4	ND	mg/L	4
Extraction Date:		3/24/99		
Analysis Date:		3/24/99		
Total Suspended Solids		mg/L		
Extraction Date:				
Analysis Date:				

Table D-10
BioGenesis Demonstration Project
Validation Test Runs
Grain Size Data

	(>0.0625 mm)	(0.0625< >0.0039)	(>0.0039)
RAW-V1-SD-01	6%	50%	44%
RAW-V1-SD-02	5%	53%	42%
RAW-V1-SD-02-DUP	5%	52%	43%
PAQ-V1-SD-01	*	*	*
RAW-V1-SL-01	8%	56%	36%
PSD-V1-SL-01	6%	72%	22%
PSD-V1-SL-02	7%	75%	18%
PSD-V1-SL-02 DUP	8%	74%	18%
PAQ-V1-SL-01	2%	10%	88%
RAW-V2-SD-01	8%	52%	40%
PAQ-V2-SD-01	*	*	*
RAW-V2-SL-01	6%	56%	38%
PSD-V2-SL-01	8%	67%	25%
PAQ-V2-SL-01	*	*	*
RAW-V3-SD-01	5%	53%	42%
PAQ-V3-SD-01	*	*	*
CBK-V3-SD-01	*	*	*
RAW-V3-SL-01	4%	48%	48%
PSD-V3-SL-01	8%	74%	18%
PAQ-V3-SL-01	*	*	*

* - Samples not analyzed using the Hydrometer Analysis

Table D-11
BioGenesis Demonstration Project
Validation Test Runs
Air Data

Sample ID:	**AER-V4-AIR-001**			**AER-V4-AIR-002**			**AER-V4-AIR-003**			**RAW-V4-AIR-001**		
Air Canister Number	12543			92042			12490			93026		
Receiving Date	3/19/99			3/19/99			3/19/99			3/19/99		
Sample Date	3/18/99			3/18/99			3/18/99			3/18/99		
Prep Date	3/31/99			3/31/99			3/31/99			3/31/99		
Analysis Date:	4/6/99			4/6/99			4/6/99			4/6/99		
Matrix	Air			Air			Air			Air		
Analyte	Result		LDL	Result		LDL	Result		LDL	Result		LDL
GC/MS Volatiles												
Dichlorodifluoromethane	0.58	ppb (v/v)	0.43	0.55	ppb (v/v)	0.43	0.53	ppb (v/v)	0.43	0.70	ppb (v/v)	0.43
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Chloromethane	ND	ppb (v/v)	1.10	ND	ppb (v/v)	1.10	ND	ppb (v/v)	1.10	ND	ppb (v/v)	1.10
Vinyl chloride	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Bromomethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Chloroethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Trichlorofluoromethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,1-Dichloroethene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,1,2 -Trichloro-1,2,2-trifluoroethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Methylene chloride	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	0.74	ppb (v/v)	0.43
1,1-Dichloroethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
cis-1,2-Dichloroethene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Chloroform	13	ppb (v/v)	0.43	18.00	ppb (v/v)	0.43	24.00	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,1,1-Trichloroethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Carbon tetrachloride	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Benzene	0.88	ppb (v/v)	0.43	1.00	ppb (v/v)	0.43	1.20	ppb (v/v)	0.43	6.80	ppb (v/v)	0.43
1,2-Dichloroethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Trichloroethene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,2-Dichloropropane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
cis-1,3-Dichloropropene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Toluene	2.3	ppb (v/v)	0.43	3.10	ppb (v/v)	0.43	3.80	ppb (v/v)	0.43	5.50	ppb (v/v)	0.43
trans-1,3-Dichloropropene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,1,2-Trichloroethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Tetrachloroethene	ND	ppb (v/v)	0.43	0.49	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,2-Dibromoethane (EDB)	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Chlorobenzene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Ethylbenzene	0.47	ppb (v/v)	0.43	0.65	ppb (v/v)	0.43	0.78	ppb (v/v)	0.43	1.30	ppb (v/v)	0.43
m-Xylene & p-Xylene	1.3	ppb (v/v)	0.43	1.80	ppb (v/v)	0.43	2.00	ppb (v/v)	0.43	3.30	ppb (v/v)	0.43
o-Xylene	0.69	ppb (v/v)	0.43	0.97	ppb (v/v)	0.43	1.10	ppb (v/v)	0.43	1.40	ppb (v/v)	0.43
Styrene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,1,2,2-Tetrachloroethane	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,3,5-Trimethylbenzene	ND	ppb (v/v)	0.43	0.50	ppb (v/v)	0.43	0.58	ppb (v/v)	0.43	0.70	ppb (v/v)	0.43
1,2,4-Trimethylbenzene	0.94	ppb (v/v)	0.43	1.00	ppb (v/v)	0.43	0.98	ppb (v/v)	0.43	1.20	ppb (v/v)	0.43
1,3-Dichlorobenzene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,4-Dichlorobenzene	ND	ppb (v/v)	0.43	0.57	ppb (v/v)	0.43	0.61	ppb (v/v)	0.43	0.67	ppb (v/v)	0.43
1,2-Dichlorobenzene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Benzyl chloride	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
1,2,4-Trichlorobenzene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43
Hexachlorobutadiene	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43	ND	ppb (v/v)	0.43

Table D-12

Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
RAW-V1-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C170182	C9C170182 001
RAW-V1-SD-01	SW846 9045C, pH	SD-1	C9C170182	C9C170182 001
RAW-V1-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C170182	C9C170182 001
RAW-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C170182	C9C170182 001
RAW-V1-SD-01	SW846 8260B, VOCs	SD-1	C9C170182	C9C170182 001
RAW-V1-SD-02	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C170182	C9C170182 002
RAW-V1-SD-02	SW846 9045C, pH	SD-1	C9C170182	C9C170182 002
RAW-V1-SD-02	SMCA WALKLEY-BLACK, TOC	SD-1	C9C170182	C9C170182 002
RAW-V1-SD-02	MCAWW 160.3 MOD, % Moisture	SD-1	C9C170182	C9C170182 002
RAW-V1-SD-02	SW846 8260B, VOCs	SD-1	C9C170182	C9C170182 002
RAW-V1-SD-02-DUP	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C170182	C9C170182 006
RAW-V1-SD-02-DUP	SW846 9045C, pH	SD-1	C9C170182	C9C170182 006
RAW-V1-SD-02-DUP	SMCA WALKLEY-BLACK, TOC	SD-1	C9C170182	C9C170182 006
RAW-V1-SD-02-DUP	MCAWW 160.3 MOD, % Moisture	SD-1	C9C170182	C9C170182 006
RAW-V1-SD-02-DUP	SW846 8260B, VOCs	SD-1	C9C170182	C9C170182 006
RAW-V1-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 002
RAW-V1-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 005
RAW-V1-SD-02	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02	SW846 6020, Metals	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02	SW846 9045C, pH	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 006
RAW-V1-SD-02-DUP	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-02-DUP	SW846 6020, Metals	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-02-DUP	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-02-DUP	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-02-DUP	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-02-DUP	SW846 9045C, pH	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-02-DUP	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-02-DUP	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-02-DUP	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 018
RAW-V1-SD-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0013-SA
RAW-V1-SD-01	SW846 1668M, PCBs	NA	304596	304596 0013-SA
RAW-V1-SD-02	SW846 8290, Dioxins/Furans	NA	304596	304596 0014-SA
RAW-V1-SD-02	SW846 1668M, PCBs	NA	304596	304596 0014-SA
RAW-V1-SD-02	SW846 8290, Dioxins/Furans	NA	304596	304596 0014-MS
RAW-V1-SD-02	SW846 1668M, PCBs	NA	304596	304596 0014-MS
RAW-V1-SD-02	SW846 8290, Dioxins/Furans	NA	304596	304596 0014-SD
RAW-V1-SD-02	SW846 1668M, PCBs	NA	304596	304596 0014-SD
RAW-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SW846 8151A, Herbicides	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SW846 6020, Metals	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SW846 8081A, Herbicides/Pesticides	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SW846 8082, PCBs	SL-1	C9C170185	C9C170185 003

Table D-12

Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
RAW-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SW846 9045C, pH	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C170185	C9C170185 003
RAW-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 016
RAW-V1-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 016
RAW-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 016
RAW-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 016
RAW-V1-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 016
RAW-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 016
RAW-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 016
RAW-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 016
RAW-V1-SL-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0012-SA
RAW-V1-SL-01	SW846 1668M, PCBs	NA	304596	304596 0012-SA
RAW-V1-AQ-01	SW846 6020, Metals	AQ-1	C9C170190	C9C170190 004
RAW-V1-AQ-01	SW846 7470A, Mercury	AQ-1	C9C170190	C9C170190 004
RAW-V1-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C170190	C9C170190 004
RAW-V1-AQ-01	SW846 8270C, PAHs	AQ-1	C9C170190	C9C170190 004
RAW-V1-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C170190	C9C170190 004
RAW-V1-AQ-01	SW846 8260B, VOCs	AQ-1	C9C170190	C9C170190 004
RAW-V1-AQ-03	SW846 6020, Metals	AQ-03	C9D170144	C9D170144 002
RAW-V1-AQ-03	SW846 7470A, Mercury	AQ-03	C9D170144	C9D170144
RAW-V1-AQ-03	MCAWW 415.1, TOC	AQ-03	C9D170144	C9D170144
RAW-V1-AQ-03	SW846 8260B, VOCs	AQ-03	C9D170144	C9D170144
RAW-V1-AQ-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0001-SA
RAW-V1-AQ-01	SW846 1668M, PCBs	NA	304596	304596 0001-SA
PPO-V1-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C170182	C9C170182 003
PPO-V1-SD-01	SW846 9045C, pH	SD-1	C9C170182	C9C170182 003
PPO-V1-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C170182	C9C170182 003
PPO-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C170182	C9C170182 003
PPO-V1-SD-01	SW846 8260B, VOCs	SD-1	C9C170182	C9C170182 003
PPO-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 8151A, Herbicides	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 6020, Metals	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 8081A, Herbicides/Pesticides	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 8082, PCBs	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 9045C, pH	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C170185	C9C170185 001
PPO-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 013
PPO-V1-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 013
PPO-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 013
PPO-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 013
PPO-V1-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 013
PPO-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 013
PPO-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 013
PPO-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 013
PPO-V1-AQ-01	SW846 6020, Metals	AQ-1	C9C170190	C9C170190 001
PPO-V1-AQ-01	SW846 7470A, Mercury	AQ-1	C9C170190	C9C170190 001
PPO-V1-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C170190	C9C170190 001
PPO-V1-AQ-01	SW846 8270C, PAHs	AQ-1	C9C170190	C9C170190 001
PPO-V1-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C170190	C9C170190 001
PPO-V1-AQ-01	SW846 8260B, VOCs	AQ-1	C9C170190	C9C170190 001
PPO-V1-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 011

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Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
PPO-V1-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 011
PPO-V1-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 011
CCO-V1-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C170182	C9C170182 004
CCO-V1-SD-01	SW846 9045C, pH	SD-1	C9C170182	C9C170182 004
CCO-V1-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C170182	C9C170182 004
CCO-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C170182	C9C170182 004
CCO-V1-SD-01	SW846 8260B, VOCs	SD-1	C9C170182	C9C170182 004
CCO-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 8151A, Herbicides	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 6020, Metals	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 8081A, Herbicides/Pesticides	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 8082, PCBs	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 9045C, pH	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C170185	C9C170185 002
CCO-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 012
CCO-V1-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 012
CCO-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 012
CCO-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 012
CCO-V1-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 012
CCO-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 012
CCO-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 012
CCO-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 012
CCO-V1-AQ-01	SW846 6020, Metals	AQ-1	C9C170190	C9C170190 002
CCO-V1-AQ-01	SW846 7470A, Mercury	AQ-1	C9C170190	C9C170190 002
CCO-V1-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C170190	C9C170190 002
CCO-V1-AQ-01	SW846 8270C, PAHs	AQ-1	C9C170190	C9C170190 002
CCO-V1-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C170190	C9C170190 002
CCO-V1-AQ-01	SW846 8260B, VOCs	AQ-1	C9C170190	C9C170190 002
CCO-V1-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 012
CCO-V1-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 012
OXO-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 8151A, Herbicides	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 6020, Metals	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 8081A, Herbicides/Pesticides	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 8082, PCBs	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 9045C, pH	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C170185	C9C170185 006
OXO-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 014
OXO-V1-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 014
OXO-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 014
OXO-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 014
OXO-V1-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 014
OXO-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 014

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Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
OXO-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 014
OXO-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 014
OXO-V1-AQ-01	SW846 6020, Metals	AQ-1	C9C170190	C9C170190 003
OXO-V1-AQ-01	SW846 7470A, Mercury	AQ-1	C9C170190	C9C170190 003
OXO-V1-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C170190	C9C170190 003
OXO-V1-AQ-01	SW846 8270C, PAHs	AQ-1	C9C170190	C9C170190 003
OXO-V1-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C170190	C9C170190 003
OXO-V1-AQ-01	SW846 8260B, VOCs	AQ-1	C9C170190	C9C170190 003
OXO-V1-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 014
OXO-V1-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 014
PAQ-V1-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 001
PAQ-V1-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 012
PAQ-V1-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 012
PAQ-V1-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 012
PAQ-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 012
PAQ-V1-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 012
PAQ-V1-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 012
PAQ-V1-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 012
PAQ-V1-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 012
PAQ-V1-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 012
PAQ-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 001
PAQ-V1-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 001
PAQ-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 001
PAQ-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 001
PAQ-V1-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 001
PAQ-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 001
PAQ-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 001
PAQ-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 001
PAQ-V1-SL-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0006-SA
PAQ-V1-SL-01	SW846 1668M, PCBs	NA	304596	304596 0006-SA
PAQ-V1-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 001
PAQ-V1-AQ-02	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 002

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Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
PAQ-V1-AQ-02	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 002
PAQ-V1-AQ-02-DUP	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-02-DUP	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 015
PAQ-V1-AQ-03	SW846 6020, Metals	AQ-03	C9D170144	C9D170144 006
PAQ-V1-AQ-03	SW846 7470A, Mercury	AQ-03	C9D170144	C9D170144
PAQ-V1-AQ-03	MCAWW 415.1, TOC	AQ-03	C9D170144	C9D170144
PAQ-V1-AQ-03	SW846 8260B, VOCs	AQ-03	C9D170144	C9D170144
PAQ-V1-AQ-03-DUP	SW846 6020, Metals	AQ-03	C9D170144	C9D170144 008
PAQ-V1-AQ-03-DUP	SW846 7470A, Mercury	AQ-03	C9D170144	C9D170144
PAQ-V1-AQ-03-DUP	MCAWW 415.1, TOC	AQ-03	C9D170144	C9D170144
PAQ-V1-AQ-03-DUP	SW846 8260B, VOCs	AQ-03	C9D170144	C9D170144
PAQ-V1-AQ-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0002-SA
PAQ-V1-AQ-01	SW846 1668M, PCBs	NA	304596	304596 0002-SA
PAQ-V1-AQ-02	SW846 8290, Dioxins/Furans	NA	304596	304596 0003-SA
PAQ-V1-AQ-02	SW846 1668M, PCBs	NA	304596	304596 0003-SA
PAQ-V1-AQ-02	SW846 8290, Dioxins/Furans	NA	304596	304596 0003-MS
PAQ-V1-AQ-02	SW846 1668M, PCBs	NA	304596	304596 0003-MS
PAQ-V1-AQ-02 DUP	SW846 8290, Dioxins/Furans	NA	304596	304596 0003-DU
PAQ-V1-AQ-02 DUP	SW846 1668M, PCBs	NA	304596	304596 0003-DU
PAQ-V1-AQ-02 SDUP	SW846 8290, Dioxins/Furans	NA	304596	304596 0003-SD
PAQ-V1-AQ-02 SDUP	SW846 1668M, PCBs	NA	304596	304596 0003-SD
PSD-V1-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SW846 8151A, Herbicides	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SW846 6020, Metals	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SW846 7471A, Mercury	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SW846 8081A, Herbicides/Pesticides	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SW846 8082, PCBs	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SW846 8270C, PAHs	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SW846 9045C, pH	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-01	SW846 8260B, VOCs	SL-1	C9C170185	C9C170185 004
PSD-V1-SL-02	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SW846 8151A, Herbicides	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SW846 6020, Metals	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SW846 7471A, Mercury	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SW846 8081A, Herbicides/Pesticides	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SW846 8082, PCBs	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SW846 8270C, PAHs	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SW846 9045C, pH	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SMCA WALKLEY-BLACK, TOC	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	MCAWW 160.3 MOD, % Moisture	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02	SW846 8260B, VOCs	SL-1	C9C170185	C9C170185 005
PSD-V1-SL-02 DUP	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	SW846 8151A, Herbicides	SL-1	C9C170185	C9C170185 007

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Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
PSD-V1-SL-02 DUP	SW846 6020, Metals	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	SW846 7471A, Mercury	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	SW846 8081A, Herbicides/Pesticides	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	SW846 8082, PCBs	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	SW846 8270C, PAHs	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	SW846 9045C, pH	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	SMCA WALKLEY-BLACK, TOC	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	MCAWW 160.3 MOD, % Moisture	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02 DUP	SW846 8260B, VOCs	SL-1	C9C170185	C9C170185 007
PSD-V1-SL-02	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 011
PSD-V1-SL-02	SW946 6020, Metals	SL-1	C9C180198	C9C180198 011
PSD-V1-SL-02	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 011
PSD-V1-SL-02	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 011
PSD-V1-SL-02	SW846 9045C, pH	SL-1	C9C180198	C9C180198 011
PSD-V1-SL-02	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 011
PSD-V1-SL-02	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 011
PSD-V1-SL-02	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 011
PSD-V1-SL-02-DUP	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 019
PSD-V1-SL-02-DUP	SW946 6020, Metals	SL-1	C9C180198	C9C180198 019
PSD-V1-SL-02-DUP	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 019
PSD-V1-SL-02-DUP	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 019
PSD-V1-SL-02-DUP	SW846 9045C, pH	SL-1	C9C180198	C9C180198 019
PSD-V1-SL-02-DUP	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 019
PSD-V1-SL-02-DUP	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 019
PSD-V1-SL-02-DUP	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 019
PSD-V1-SL-02	SW846 8290, Dioxins/Furans	NA	304596	304596 0011-SA
PSD-V1-SL-02	SW846 1668M, PCBs	NA	304596	304596 0011-SA
PSD-V1-SL-02	SW846 8290, Dioxins/Furans	NA	304596	304596 0011-MS
PSD-V1-SL-02	SW846 1668M, PCBs	NA	304596	304596 0011-MS
PSD-V1-SL-02	SW846 8290, Dioxins/Furans	NA	304596	304596 0011-SD
PSD-V1-SL-02	SW846 1668M, PCBs	NA	304596	304596 0011-SD
TB-V1-AQ-02	SW846 6020, Metals	AQ-1	C9C170190	C9C170190 005
TB-V1-AQ-02	SW846 7470A, Mercury	AQ-1	C9C170190	C9C170190 005
TB-V1-AQ-02	MCAWW 160.2, TSS	AQ-1	C9C170190	C9C170190 005
TB-V1-AQ-02	SW846 8270C, PAHs	AQ-1	C9C170190	C9C170190 005
TB-V1-AQ-02	MCAWW 415.1, TOC	AQ-1	C9C170190	C9C170190 005
TB-V1-AQ-02	SW846 8260B, VOCs	AQ-1	C9C170190	C9C170190 005
RAW-V2-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 007
RAW-V2-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 007
RAW-V2-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 007
RAW-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 007
RAW-V2-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 007
RAW-V2-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 007
RAW-V2-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 007
RAW-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 007
RAW-V2-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 007
RAW-V2-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 002
RAW-V2-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 002
RAW-V2-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 002
RAW-V2-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 002
RAW-V2-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 002
RAW-V2-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 002
RAW-V2-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 002
RAW-V2-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 002
RAW-V2-SL-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0007-SA
RAW-V2-SL-01	SW846 1668M, PCBs	NA	304596	304596 0007-SA
RAW-V2-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 003

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Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
RAW-V2-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 003
RAW-V2-AQ-03	SW846 6020, Metals	AQ-03	C9D170144	C9D170144 003
RAW-V2-AQ-03	SW846 7470A, Mercury	AQ-03	C9D170144	C9D170144
RAW-V2-AQ-03	MCAWW 415.1, TOC	AQ-03	C9D170144	C9D170144
RAW-V2-AQ-03	SW846 8260B, VOCs	AQ-03	C9D170144	C9D170144
RAW-V2-AQ-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0004-SA
RAW-V2-AQ-01	SW846 1668M, PCBs	NA	304596	304596 0004-SA
PPO-V2-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 011
PPO-V2-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 011
PPO-V2-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 011
PPO-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 011
PPO-V2-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 011
PPO-V2-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 011
PPO-V2-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 011
PPO-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 011
PPO-V2-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 011
PPO-V2-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 003
PPO-V2-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 003
PPO-V2-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 003
PPO-V2-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 003
PPO-V2-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 003
PPO-V2-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 003
PPO-V2-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 003
PPO-V2-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 003
PPO-V2-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 004
PPO-V2-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 004
AER-V2-AIR-001	EPA-2 TO-14, VOCs	NA	H9C240106	H9C240106 003
CCO-V2-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 009
CCO-V2-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 009
CCO-V2-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 009
CCO-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 009
CCO-V2-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 009
CCO-V2-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 009
CCO-V2-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 009
CCO-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 009
CCO-V2-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 009
CCO-V2-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 004
CCO-V2-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 004
CCO-V2-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 004
CCO-V2-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 004
CCO-V2-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 004
CCO-V2-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 004
CCO-V2-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 004
CCO-V2-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 004
CCO-V2-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 005

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Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
CCO-V2-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 005
CCO-V2-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 005
OXO-V2-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 016
OXO-V2-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 016
OXO-V2-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 016
OXO-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 016
OXO-V2-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 016
OXO-V2-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 016
OXO-V2-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 016
OXO-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 016
OXO-V2-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 016
OXO-V2-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 006
OXO-V2-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 006
OXO-V2-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 006
OXO-V2-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 006
OXO-V2-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 006
OXO-V2-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 006
OXO-V2-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 006
OXO-V2-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 006
OXO-V2-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 006
OXO-V2-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 006
PAQ-V2-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 004
PAQ-V2-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 013
PAQ-V2-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 013
PAQ-V2-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 013
PAQ-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 013
PAQ-V2-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 013
PAQ-V2-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 013
PAQ-V2-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 013
PAQ-V2-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 013
PAQ-V2-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 013
PAQ-V2-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 008
PAQ-V2-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 008
PAQ-V2-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 008
PAQ-V2-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 008
PAQ-V2-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 008
PAQ-V2-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 008
PAQ-V2-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 008
PAQ-V2-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 008
PAQ-V2-SL-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0010-SA
PAQ-V2-SL-01	SW846 1668M, PCBs	NA	304596	304596 0010-SA
PAQ-V2-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 007

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Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
PAQ-V2-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 007
PAQ-V2-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 018
PAQ-V2-AQ-03	SW846 6020, Metals	AQ-03	C9D170144	C9D170144 001
PAQ-V2-AQ-03	SW846 7470A, Mercury	AQ-03	C9D170144	C9D170144
PAQ-V2-AQ-03	MCAWW 415.1, TOC	AQ-03	C9D170144	C9D170144
PAQ-V2-AQ-03	SW846 8260B, VOCs	AQ-03	C9D170144	C9D170144
PAQ-V2-AQ-03	SW846 6020, Metals	AQ-03	C9D170144	C9D170144 010
PAQ-V2-AQ-03	SW846 7470A, Mercury	AQ-03	C9D170144	C9D170144
PAQ-V2-AQ-03	MCAWW 415.1, TOC	AQ-03	C9D170144	C9D170144
PAQ-V2-AQ-03	SW846 8260B, VOCs	AQ-03	C9D170144	C9D170144
PAQ-V2-AQ-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0005-SA
PAQ-V2-AQ-01	SW846 1668M, PCBs	NA	304596	304596 0005-SA
PSD-V2-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 007
PSD-V2-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 007
PSD-V2-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 007
PSD-V2-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 007
PSD-V2-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 007
PSD-V2-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 007
PSD-V2-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 007
PSD-V2-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 007
PSD-V2-SL-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0009-SA
PSD-V2-SL-01	SW846 1668M, PCBs	NA	304596	304596 0009-SA
RAW-V3-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 003
RAW-V3-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 008
RAW-V3-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 008
RAW-V3-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 008
RAW-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 008
RAW-V3-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 008
RAW-V3-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 008
RAW-V3-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 008
RAW-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 008
RAW-V3-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 008
RAW-V3-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 005
RAW-V3-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 005

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Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
RAW-V3-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 005
RAW-V3-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 005
RAW-V3-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 005
RAW-V3-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 005
RAW-V3-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 005
RAW-V3-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 005
RAW-V3-SL-01	SW846 8290, Dioxins/Furans	NA	304596	304596 0008-SA
RAW-V3-SL-01	SW846 1668M, PCBs	NA	304596	304596 0008-SA
RAW-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 017
RAW-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C190248	C9C190248 003
RAW-V3-AQ-01	SW846 8290, Dioxins/Furans	NA	304612	304612 0008-SA
RAW-V3-AQ-01	SW846 1668M, PCBs	NA	304612	304612 0008-SA
PPO-V3-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 017
PPO-V3-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 017
PPO-V3-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 017
PPO-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 017
PPO-V3-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 017
PPO-V3-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 017
PPO-V3-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 017
PPO-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 017
PPO-V3-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 017
PPO-V3-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 009
PPO-V3-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 009
PPO-V3-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 009
PPO-V3-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 009
PPO-V3-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 009
PPO-V3-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 009
PPO-V3-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 009
PPO-V3-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 009
PPO-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 008
PPO-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 008

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Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
PPO-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 008
CCO-V3-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 010
CCO-V3-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 010
CCO-V3-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 010
CCO-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 010
CCO-V3-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 010
CCO-V3-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 010
CCO-V3-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 010
CCO-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 010
CCO-V3-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 010
CCO-V3-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 010
CCO-V3-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 010
CCO-V3-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 010
CCO-V3-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 010
CCO-V3-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 010
CCO-V3-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 010
CCO-V3-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 010
CCO-V3-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 010
CCO-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 009
CCO-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 013
CCO-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 013
OXO-V3-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 019
OXO-V3-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 019
OXO-V3-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 019
OXO-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 019
OXO-V3-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 019
OXO-V3-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 019
OXO-V3-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 019
OXO-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 019
OXO-V3-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 019
OXO-V3-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 015
OXO-V3-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 015
OXO-V3-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 015
OXO-V3-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 015
OXO-V3-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 015
OXO-V3-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 015
OXO-V3-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 015
OXO-V3-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 015
OXO-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 010

Table D-12

Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
OXO-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 010
OXO-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 010
PAQ-V3-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 014
PAQ-V3-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 014
PAQ-V3-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 014
PAQ-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 014
PAQ-V3-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 014
PAQ-V3-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 014
PAQ-V3-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 014
PAQ-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 014
PAQ-V3-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 014
PAQ-V3-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 017
PAQ-V3-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 017
PAQ-V3-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 017
PAQ-V3-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 017
PAQ-V3-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 017
PAQ-V3-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 017
PAQ-V3-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 017
PAQ-V3-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 017
PAQ-V3-SL-01	SW846 6020, Metals	SL-1	C9C190249	C9C190249 002
PAQ-V3-SL-01	SW846 7471A, Mercury	SL-1	C9C190249	C9C190249 002
PAQ-V3-SL-01	SW846 8270C, PAHs	SL-1	C9C190249	C9C190249 002
PAQ-V3-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C190249	C9C190249 002
PAQ-V3-SL-01	SW846 8260B, VOCs	SL-1	C9C190249	C9C190249 002
PAQ-V3-SL-01	SW846 8290, Dioxins/Furans	NA	304612	304612 0002-SA
PAQ-V3-SL-01	SW846 1668M, PCBs	NA	304612	304612 0002-SA
PAQ-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C180212	C9C180212 016
PAQ-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C190248	C9C190248 002
PAQ-V3-AQ-03	SW846 6020, Metals	AQ-03	C9D170144	C9D170144 009
PAQ-V3-AQ-03	SW846 7470A, Mercury	AQ-03	C9D170144	C9D170144
PAQ-V3-AQ-03	MCAWW 415.1, TOC	AQ-03	C9D170144	C9D170144
PAQ-V3-AQ-03	SW846 8260B, VOCs	AQ-03	C9D170144	C9D170144
PAQ-V3-AQ-01	SW846 8290, Dioxins/Furans	NA	304612	304612 0007-SA
PAQ-V3-AQ-01	SW846 1668M, PCBs	NA	304612	304612 0007-SA

Table D-12

Validation Phase Data
Sample Identification Reference

Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
PSD-V3-SL-01	SW846 9030A, Acid-Insoluble Sulfide	SL-1	C9C180198	C9C180198 018
PSD-V3-SL-01	SW946 6020, Metals	SL-1	C9C180198	C9C180198 018
PSD-V3-SL-01	SW846 7471A, Mercury	SL-1	C9C180198	C9C180198 018
PSD-V3-SL-01	SW846 8270C, PAHs	SL-1	C9C180198	C9C180198 018
PSD-V3-SL-01	SW846 9045C, pH	SL-1	C9C180198	C9C180198 018
PSD-V3-SL-01	SMCA WALKLEY-BLACK, TOC	SL-1	C9C180198	C9C180198 018
PSD-V3-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C180198	C9C180198 018
PSD-V3-SL-01	SW846 8260B, VOCs	SL-1	C9C180198	C9C180198 018
PSD-V3-SL-01	SW846 6020, Metals	SL-1	C9C190249	C9C190249 001
PSD-V3-SL-01	SW846 7471A, Mercury	SL-1	C9C190249	C9C190249 001
PSD-V3-SL-01	SW846 8270C, PAHs	SL-1	C9C190249	C9C190249 001
PSD-V3-SL-01	MCAWW 160.3 MOD, % Moisture	SL-1	C9C190249	C9C190249 001
PSD-V3-SL-01	SW846 8260B, VOCs	SL-1	C9C190249	C9C190249 001
PSD-V3-SL-01	SW846 8290, Dioxins/Furans	NA	304612	304612 0001-SA
PSD-V3-SL-01	SW846 1668M, PCBs	NA	304612	304612 0001-SA
PSW-V3-AQ-01	MCAWW 150.1, pH	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	MCAWW 405.1, BOD	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	MCAWW 410.4, COD	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	MCAWW 160.1, TDS	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	SW846 6020, Metals	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	SW846 7470A, Mercury	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	MCAWW 160.2, TSS	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	SW846 8270C, PAHs	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	MCAWW 365.2, Total Phosphorous	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	MCAWW 351.3, TKN	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	MCAWW 415.1, TOC	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-01	SW846 8260B, VOCs	AQ-1	C9C190248	C9C190248 004
PSW-V3-AQ-03	SW846 6020, Metals	AQ-03	C9D170144	C9D170144 011
PSW-V3-AQ-03	SW846 7470A, Mercury	AQ-03	C9D170144	C9D170144
PSW-V3-AQ-03	MCAWW 415.1, TOC	AQ-03	C9D170144	C9D170144
PSW-V3-AQ-03	SW846 8260B, VOCs	AQ-03	C9D170144	C9D170144
PSW-V3-AQ-01	SW846 8290, Dioxins/Furans	NA	304612	304612 0009-SA
PSW-V3-AQ-01	SW846 1668M, PCBs	NA	304612	304612 0009-SA
TBK-V3	MCAWW 150.1, pH	AQ-1	C9C190248	C9C190248 001
TBK-V3	MCAWW 405.1, BOD	AQ-1	C9C190248	C9C190248 001
TBK-V3	MCAWW 410.4, COD	AQ-1	C9C190248	C9C190248 001
TBK-V3	MCAWW 160.1, TDS	AQ-1	C9C190248	C9C190248 001
TBK-V3	SW846 6020, Metals	AQ-1	C9C190248	C9C190248 001
TBK-V3	SW846 7470A, Mercury	AQ-1	C9C190248	C9C190248 001
TBK-V3	MCAWW 160.2, TSS	AQ-1	C9C190248	C9C190248 001
TBK-V3	SW846 8270C, PAHs	AQ-1	C9C190248	C9C190248 001
TBK-V3	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C190248	C9C190248 001
TBK-V3	MCAWW 365.2, Total Phosphorous	AQ-1	C9C190248	C9C190248 001
TBK-V3	MCAWW 351.3, TKN	AQ-1	C9C190248	C9C190248 001
TBK-V3	MCAWW 415.1, TOC	AQ-1	C9C190248	C9C190248 001
TBK-V3	SW846 8260B, VOCs	AQ-1	C9C190248	C9C190248 001
FBK-V3-AQ-02	MCAWW 150.1, pH	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	MCAWW 405.1, BOD	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	MCAWW 410.4, COD	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	MCAWW 160.1, TDS	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	SW846 6020, Metals	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	SW846 7470A, Mercury	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	MCAWW 160.2, TSS	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	SW846 8270C, PAHs	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	MCAWW 425.1, MBAS (Surfactants)	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	MCAWW 365.2, Total Phosphorous	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	MCAWW 351.3, TKN	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	MCAWW 415.1, TOC	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	SW846 8260B, VOCs	AQ-1	C9C190248	C9C190248 005
FBK-V3-AQ-02	SW846 8290, Dioxins/Furans	NA	304612	304612 0010-SA
FBK-V3-AQ-02	SW846 1668M, PCBs	NA	304612	304612 0010-SA
CBK-V3-SD-01	SW846 9030A, Acid-Insoluble Sulfide	SD-1	C9C180189	C9C180189 015
CBK-V3-SD-01	SW846 6020, Metals	SD-1	C9C180189	C9C180189 015
CBK-V3-SD-01	SW846 7471A, Mercury	SD-1	C9C180189	C9C180189 015

Table D-12

Validation Phase Data
Sample Identification Reference

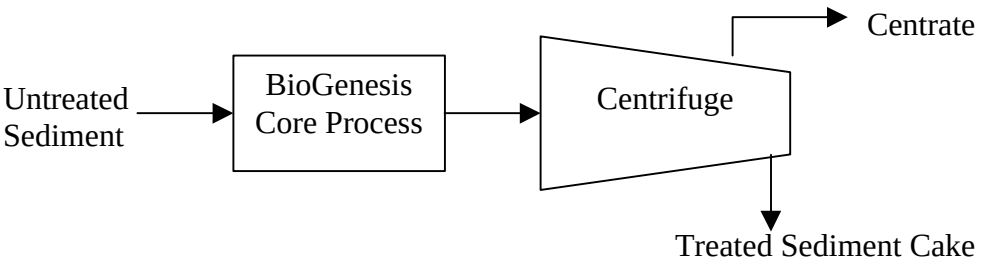
Client Sample ID	Analytical Methods	SDG #	Batch #	Lab Sample ID
CBK-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 015
CBK-V3-SD-01	SW846 8270C, PAHs	SD-1	C9C180189	C9C180189 015
CBK-V3-SD-01	SW846 9045C, pH	SD-1	C9C180189	C9C180189 015
CBK-V3-SD-01	SMCA WALKLEY-BLACK, TOC	SD-1	C9C180189	C9C180189 015
CBK-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C180189	C9C180189 015
CBK-V3-SD-01	SW846 8260B, VOCs	SD-1	C9C180189	C9C180189 015
CBK-V3-SD-01	SW846 6020, Metals	SD-1	C9C190246	C9C190246 001
CBK-V3-SD-01	SW846 7471A, Mercury	SD-1	C9C190246	C9C190246 001
CBK-V3-SD-01	SW846 8270C, PAHs	SD-1	C9C190246	C9C190246 001
CBK-V3-SD-01	MCAWW 160.3 MOD, % Moisture	SD-1	C9C190246	C9C190246 001
CBK-V3-SD-01	SW846 8260B, VOCs	SD-1	C9C190246	C9C190246 001
CBK-V3-SD-01	SW846 8290, Dioxins/Furans	NA	304612	304612 0003-SA
CBK-V3-SD-01	SW846 1668M, PCBs	NA	304612	304612 0003-SA
AER-V4-AIR-002	EPA-2 TO-14, VOCs	NA	H9C240106	H9C240106 004
AER-V4-AIR-003	EPA-2 TO-14, VOCs	NA	H9C240106	H9C240106 005
RAW-V4-AIR-001	EPA-2 TO-14, VOCs	NA	H9C240106	H9C240106 006

APPENDIX E

MASS BALANCE CALCULATIONS

Client: **BioGenesis Enterprises, Inc.** W.O. # **11836.001.002**
Task Description: **Process Mass Balance Calculations**
Prepared by: **J. Sontag** Dept.: **001075** Date: **11/29/99**
Math/Method Check by: **G. Cifolelli** Dept.: **001274** Date: **11/29/99**

Problem Statement: Determine solids/liquids mass balance through-out the pilot-scale process and mass balance distribution of contaminants.



I. SOLIDS/LIQUIDS MASS BALANCE

A. Batch of Untreated (Raw) Sediment

Volume: 1,475 gal. (each batch)
Specific Gravity: 1.25 (measured in field)
Percent Solids:

RAW-V1-SD-01:	31.3%
	32.3%
RAW-V2-SD-01:	32.0%
	38.2%
RAW-V3-SD-01:	32.0%
Average:	33.16%
Standard Dev.:	2.54%

Total Mass = 1,475 gal x 8.345 $\frac{lb}{gal}$ x 1.25

= **15,386 lbs**

Mass of Solids = 15,386 lbs x 33.16%

= **5,102 lbs**

Mass of Liquids = 15,386 lbs – 5,102 lbs

= **10,284 lbs**

B. Water Added in Each Batch During Processing

1. Pre-processor – Water added at 60 gpm for the time the sediment flowed through pre-processor plus one a minute flush.

Run V1: 60 gpm x (12 min + 1 min) = 780 gal
Run V2: 60 gpm x (26 min + 1 min) = 1,620 gal
Run V3: 60 gpm x (13 min + 1 min) = 840 gal

Average: **1,080 gal**
Standard Dev: 383 gal

2. Collisoin Chamber (Sediment Washer) – Water added at 60 gpm for the time the sediment slurry flowed through the collision chamber plus a two minute flush. Sediment slurry flow rate was 175 gpm.

Run V1: = 1,475 gal + 780 gal = 2,255 gal

$$= \left(\frac{2{,}255\,\text{gal}}{175\,\text{gpm}} + 2\,\text{min}\right)60\,\text{gpm}$$

= 893 gal

Run V2: = 1,475 gal + 1,620 gal = 3,095 gal

$$= \left(\frac{3{,}095\,\text{gal}}{175\,\text{gpm}} + 2\,\text{min}\right)60\,\text{gpm}$$

= 1,181 gal

Run V3: = 1,475 gal + 840 gal = 2,315 gal

$$= \left(\frac{2{,}315\,\text{gal}}{175\,\text{gpm}} + 2\,\text{min}\right)60\,\text{gpm}$$

= 914 gal

Average: **996 gal**
Standard Dev.: 131 gal

3. Total Process Water Added (Average)

= 1,080 gal + 996 gal = **2,076 gal**

Mass = 2,076 gal x 8.345 $\frac{lb}{gal}$ = **17,234 lb**

4. Water added in Hydrogen Peroxide Solution:

25 gal H_2O_2 at 35% H_2O_2

= 25 gal x 65% = **16.3 gal**

Mass = 16.3 gal x 8.345 $\frac{lb}{gal}$ = **136 lb**

C. Determine solids distribution in centrate and treated sediment cake.

1. Total solids in process: **5,102 lbs** from I.A.

2. Total Liquids in Process

Raw untreated solids from I.A.	10,284 lbs
added process water from I.B. 3	+17,324 lbs
water in H_2O_2 from I.B. 4	+136 lbs
	27,744 lbs

3. From data calculate the average percent solids in the treated sediment cake:

PSD-V1-SL-01:	69.9%
PSD-V2-SL-01:	71.8%
PSD-V3-SL-01:	67.8%
	66.6%
Average =	**69.0%**
Standard Dev. =	1.99%

4. From data calculate the average percent solids in the centrate:

PAQ-V1-SD-01	5.4%
	6.2%
PAQ-V2-SD-01	5.1%
	4.7%
PAQ-V3-SD-01	8.2%
Average =	**5.92%**
Standard Dev. =	1.24%

5. Using iteration, determine the mass of solids and liquids in the treated sediment cake and centrate:

a) Iteration 1: Assume mass of solids in cake = 4,000 lb
Given cake @ 69.0% solids

	Total	Cake	Centrate
Solids	5,102 lb	4,000 lb	1,102 lb
Liquids	27,774 lb	1,797 lb	25,947 lb
Total	32,846 lb	5,797 lb	27,049 lb
% Solids		69.0%	4.07%

b) Iteration 2: Need more solids in centrate.
Assume 3,500 lbs @ 69.0% solids in cake

	Total	Cake	Centrate
Solids	5,102 lb	3,500 lb	1602 lb
Liquids	27,774 lb	1,572 lb	26,172 lb
Total	32,846 lb	5,072 lb	27,774 lb
% Solids		69.0%	5.76%

c) Iteration 3: Need more solids in centrate.
Assume 3,450 lbs @ 69.0% solids in cake

	Total	Cake	Centrate
Solids	5,102 lb	3,450 lb	1,652 lb
Liquids	27,774 lb	1,550 lb	26,194 lb
Total	32,846 lb	5,000 lb	27,846 lb
% Solids		69.0%	5.93%

d) Iteration 4: Need Less Solids in centrate.
Assume 3,445 lbs @ 69.0% solids in cake

	Total	Cake	Centrate	
Solids	5,102 lb	3,455 lb	1,647 lb	
Liquids	27,774 lb	1,552 lb	26,192 lb	
Total	32,846 lb	5,007 lb	27,839 lb	
% Solids		69.1%	**5.92%**	**- OK**

e) So Mass Balance Across the Whole Process

	Into Process			**Out of Process**	
	Untreated Sediment	**Process Water**	**Water In H_20_2**	**Treated Sediment**	**Centrate**
Total Mass (lb)	15,386 lb	17,324 lb	136 lb	5,007 lb	27,839 lb
Mass Solids (lb)	5,102 lb	0 lb	0 lb	3,455 lb	1,647 lb
Mass Liquids (lb)	10,284 lb	17,324 lb	136 lb	1,552 lb	26,192 lb
Percent Solids (%)	33.16%	0%	0%	69.0%	5.92%

II. CALCULATE MASS DISTRIBUTION OF COPPER THROUGH PILOT-SCALE PROCESS

A. Determine the mass of copper in the raw untreated sediment. Raw sediment slurry was separated into solid sample (identified "SL") and aqueous sample (identified "AQ").

1. Find average concentration in solid portion of raw untreated sediment:

RAW-V1-SL-01:	179 mg/Kg
RAW-V2-SL-01:	129 mg/Kg
RAW-V3-SL-01:	186 mg/Kg
Average:	**165 mg/Kg**
Standard Dev:	31 mg/Kg

2. Find mass of copper in solids in raw untreated sediment:

$$\text{Mass Copper} = 165 \frac{\text{mg}}{\text{Kg}} \times 5{,}102 \frac{\text{lbs of Solids from I.C.5.3}}{2{,}205 \text{ lbs/Kg}}$$

Mass Copper in Solids = 381,782 mg

3. Find average concentration in liquid portion of raw untreated sediment:

RAW-V1-AQ-01:	7,500 ug/L
RAW-V2-AQ-01:	5,370 ug/L
RAW-V3-AQ-01:	18,200 ug/L
Average:	**10,357 ug/L**
Standard Dev:	6,876 ug/L

4. Find mass of copper in liquid portion of raw untreated sediment:

Mass of Copper = 10,357 ug/L x 10,284 lb of liquids from I.C.5.3

$$\times \frac{3.785 \text{ L}}{\text{gal}} \times \frac{1 \text{ gallon water}}{8.345 \text{ lbs}} \times \frac{1 \text{ mg}}{1{,}000 \text{ ug}}$$

Mass of Copper in Liquids = 3,372 mg

5. Find mass of copper in process water added:

Concentration in Process Water:
PSW-V3-AQ-01: 9 ug/L

Mass of Copper in Process Water:

9 ug/L x 17,324 lb of water from I.C.5.3

$$\times \frac{3.785\ L}{gal} \times \frac{1\ gallon\ water}{8.345\ lbs} \times \frac{1\ mg}{1{,}000\ ug}$$

Mass of Copper in Process Water = 70.7 mg

6. Find average concentration in treated sediment (note: "SL" sample was collected "as is" without sample prep.).

PSD-V1-SL-01	58 mg/Kg
PSD-V2-SL-01	50 mg/Kg
PSD-V3-SL-01	62 mg/Kg
Average:	**57 mg/Kg**
Standard Dev:	6 mg/Kg

7. Find mass of copper in treated sediment:

$$\text{Mass of Copper} = 57\ mg/Kg \times \frac{3{,}455\ lbs\ of\ solids\ from\ I.C.5.3}{2.205\ lbs/Kg}$$

Mass of Copper in Treated Solids = 89,313 mg

8. Find average concentration in centrate liquids (filtered samples):

PAQ-V1-AQ-01:	4,170 ug/L
PAQ-V2-AQ-01:	3,680 ug/L
PAQ-V3-AQ-01:	4,200 ug/L
Average:	**4,023 ug/L**
Standard Dev:	244 ug/L

9. Mass of copper in centrate liquids:

Mass of Copper = 4,023 ug/L x 26,192 lbs of liquids from I.C.5.3

$$\frac{3.785\ \text{L}}{\text{gal}} \times \frac{1\ \text{gallon of water}}{8{,}345\ \text{lbs}} \times \frac{1\ \text{mg}}{1{,}000\ \text{ug}}$$

Mass of Copper in Centrate Liquids = 47,792 mg

10. Find average concentration in centrate solids:

PAQ-V1-SL-01:	294 mg/Kg
PAQ-V2-SL-01:	343 mg/Kg
PAQ-V3-SL-01:	363 mg/Kg
Average:	**333 mg/Kg**
Standard Dev:	29 mg/Kg

11. Mass of copper in centrate solids:

$$\text{Mass of Copper} = 333\ \text{mg/Kg} \times \frac{1{,}647\ \text{lbs of solids from I.C.5.3}}{2{,}205\ \text{lbs/Kg}}$$

Mass of Copper in Centrate Solids = 248,731 mg

12. Summary of Mass Balance

	Process Inlets		**Process Outlets**	
	Untreated Sediment	**Process Water**	**Treated Sediment**	**Centrate**
Copper in Liquids (mg)	48,310 mg	70.7 mg	---	47,792 mg
Copper in Solids (mg)	381,782 mg	---	89,313 mg	248,731 mg
	Total =	**430,163 mg**	**Total =**	**385,836 mg**
				- 10.3%

Concentration and Mass Balance Calculations for: Copper

Analytical Data			Untreated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment	PAQ	PSW
Concentrations in SL Samples									
Run V1	V1-SL-01 Sample	mg/kg	179	106	170	68	58	294	
Run V2	V2-SL-01 Sample	mg/kg	129	141	269	61	50	343	
Run V3	V3-SL-01 Sample	mg/kg	186	71	94	161	62	363	
Average		**mg/kg**	**165**	**106**	**178**	**97**	**57**	**333**	
Standard Deviation of SL Data		mg/kg	31	35	88	56	6	36	
Concentrations in AQ Samples									
Run V1	V1-AQ-01 Sample	ug/L	7,500	159	128	5,130		4,170	
Run V2	V2-AQ-01 Sample	ug/L	5,370	792	286	4,910		3,680	
Run V3	V3-AQ-01 Sample	ug/L	18,200	1,530	595	4,450		4,220	9
Average		**ug/L**	**10,357**	**827**	**336**	**4,830**		**4,023**	**9**
Standard Deviation of AQ Data		ug/L	6,876	686	238	347		298	

ND = Not Detected, Half the Detection Limit Shown

Mass Balance Calculations		Process Inlets				Process Outlets		
		Untreated Sediment	Process Water	H_2O_2 Water	Total Process Inlets	Treated Sediment	Centrate	Total Process Oulets
Total Mass of Solids	lbs	5,102	-	-	5,102	3,455	1,647	5,102
Total Mass of Liquids	lbs	10,284	17,324	136	27,744	1,552	26,192	27,744
Concentration of Copper in Solids	mg/kg	165	-	-	-	57	333	NA
Concentration of Copper in Liquids	ug/L	10,357	9	-	-	-	4,023	NA
Mass of Copper on Solids	mg	381,782	-	-	381,782	89,313	248,731	338,044
Mass of Copper in Liquids	mg	48,310	71	-	48,381	-	47,792	47,792
Total Mass of Copper	mg	430,092	71	-	430,163	89,313	296,523	385,836
								-10.3%
Mass of Copper on Untreated Solids	mg				381,782			
Mass of Copper on Solids in Centrate	mg							248,731
Mass of Copper on Treated Solids	mg							89,313
Mass of Copper in Liquids	mg				48,381			47,792

Concentration and Mass Balance Calculations for: Mercury

Analytical Data			Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment	PAQ	PSW
Concentrations in SL Samples									
Run V1	V1-SL-01 Sample	mg/kg	4.4	2.8	3.2	1.6	0.42	9.1	
Run V2	V2-SL-01 Sample	mg/kg	3.1	4.4	5.2	1.4	0.26	10.2	
Run V3	V3-SL-01 Sample	mg/kg	4.2	1.9	1.3	3.4	0.21	1.8	
Average		**mg/kg**	**3.9**	**3.0**	**3.2**	**2.1**	**0.30**	**7.0**	
Standard Deviation of SL Data		mg/kg	0.7	1.3	2.0	1.1	0.11	4.6	
Concentrations in AQ Samples									
Run V1	V1-AQ-01 Sample	ug/L	141	3.7	3.2	11.4		47.2	
Run V2	V2-AQ-01 Sample	ug/L	155	11.7	5.6	53.8		15.0	
Run V3	V3-AQ-01 Sample	ug/L	372	31.7	12.6	21.4		23.7	0.1 ND
Average		**ug/L**	**223**	**15.7**	**7.1**	**28.9**		**28.6**	**0.1**
Standard Deviation of AQ Data		ug/L	130	14.4	4.9	22.2		16.7	

ND = Not Detected, Half the Detection Limit Shown

Mass Balance Calculations		Process Inlets				Process Outlets		
		Untreated Sediment	Process Water	H_2O_2 Water	Total Process Inlets	Treated Sediment	Centrate	Total Process Oulets
Total Mass of Solids	lbs	5,102	-	-	5,102	3,455	1,647	5,102
Total Mass of Liquids	lbs	10,284	17,324	136	27,744	1,552	26,192	27,744
Concentration of Mercury in Solids	mg/kg	3.9	-	-	-	0.30	7.0	NA
Concentration of Mercury in Liquids	ug/L	223	0	-	-	-	28.6	NA
Mass of Mercury on Solids	mg	9,024	-	-	9,024	465	5,253	5,718
Mass of Mercury in Liquids	mg	1,039	1	-	1,039	-	340	340
Total Mass of Mercury	mg	10,063	1	-	10,063	465	5,594	6,058
								-39.8%
Mass of Mercury on Untreated Solids	mg				9,024			
Mass of Mercury on Solids in Centrate	mg							5,253
Mass of Mercury on Treated Solids	mg							465
Mass of Mercury in Liquids	mg				1,039			340

Concentration and Mass Balance Calculations for: Nickel

Analytical Data			Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment	PAQ	PSW
Concentrations in SL Samples									
Run V1	V1-SL-01 Sample	mg/kg	33.9	32.8	43.1	28.7	25.7	51.7	
Run V2	V2-SL-01 Sample	mg/kg	34.2	42.9	50.3	30.3	22.6	63.3	
Run V3	V3-SL-01 Sample	mg/kg	29.0	29.6	28.8	36.3	25.5	63.9	
Average		**mg/kg**	**32.4**	**35.1**	**40.7**	**31.8**	**24.6**	**59.6**	
Standard Deviation of SL Data		mg/kg	2.9	6.9	10.9	4.0	1.7	6.9	
Concentrations in AQ Samples									
Run V1	V1-AQ-01 Sample	ug/L	1,490	105	68.8	500		537	
Run V2	V2-AQ-01 Sample	ug/L	670	107	66.3	499		388	
Run V3	V3-AQ-01 Sample	ug/L	2,270	214	101	364		432	1.1
Average		**ug/L**	**1,477**	**142**	**78.7**	**454**		**452**	**1.1**
Standard Deviation of AQ Data		ug/L	800	62	19.4	78		77	

ND = Not Detected, Half the Detection Limit Shown

Mass Balance Calculations		Process Inlets				Process Outlets		
		Untreated Sediment	Process Water	H_2O_2 Water	Total Process Inlets	Treated Sediment	Centrate	Total Process Oulets
Total Mass of Solids	lbs	5,102	-	-	5,102	3,455	1,647	5,102
Total Mass of Liquids	lbs	10,284	17,324	136	27,744	1,552	26,192	27,744
Concentration of Nickel in Solids	mg/kg	32.4	-	-	-	24.60	59.6	NA
Concentration of Nickel in Liquids	ug/L	1,477	1	-	-	-	452.3	NA
Mass of Nickel on Solids	mg	74,891	-	-	74,891	38,546	44,542	83,088
Mass of Nickel in Liquids	mg	6,888	9	-	6,896	-	5,374	5,374
Total Mass of Nickel	mg	81,779	9	-	81,788	38,546	49,916	88,462
								-8.2%
Mass of Nickel on Untreated Solids	mg				74,891			
Mass of Nickel on Solids in Centrate	mg							44,542
Mass of Nickel on Treated Solids	mg							38,546
Mass of Nickel in Liquids	mg				6,896			5,374

Concentration and Mass Balance Calculations for: Lead

Analytical Data			Untreated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment	PAQ	PSW
Concentrations in SL Samples									
Run V1	V1-SL-01 Sample	mg/kg	172	113	125	74.7	71.1	295	
Run V2	V2-SL-01 Sample	mg/kg	130	161	243	71.3	57.2	356	
Run V3	V3-SL-01 Sample	mg/kg	168	74.6	101	160	75.5	387	
Average		**mg/kg**	**157**	**116**	**156**	**102**	**67.9**	**346**	
Standard Deviation of SL Data		mg/kg	23.2	43.3	76.0	50.3	9.55	46.8	
Concentrations in AQ Samples									
Run V1	V1-AQ-01 Sample	ug/L	6,600	2,190	1,570	1,300		2,180	
Run V2	V2-AQ-01 Sample	ug/L	4,840	1,730	1,170	2,270		1,070	
Run V3	V3-AQ-01 Sample	ug/L	15,800	3,270	1,940	1,950		2,060	0.5 ND
Average		**ug/L**	**9,080**	**2,397**	**1,560**	**1,840**		**1,770**	**0.5**
Standard Deviation of AQ Data		ug/L	5,886	791	385	494		609	

ND = Not Detected, Half the Detection Limit Shown

Mass Balance Calculations		Process Inlets				Process Outlets		
		Untreated Sediment	Process Water	H_2O_2 Water	Total Process Inlets	Treated Sediment	Centrate	Total Process Oulets
Total Mass of Solids	lbs	5,102	-	-	5,102	3,455	1,647	5,102
Total Mass of Liquids	lbs	10,284	17,324	136	27,744	1,552	26,192	27,744
Concentration of Lead in Solids	mg/kg	156.7	-	-	-	67.93	346.0	NA
Concentration of Lead in Liquids	ug/L	9,080	1	-	-	-	1,770.0	NA
Mass of Lead on Solids	mg	362,500	-	-	362,500	106,444	258,441	364,885
Mass of Lead in Liquids	mg	42,353	4	-	42,357	-	21,027	21,027
Total Mass of Lead	mg	404,854	4	-	404,858	106,444	279,468	385,912
								-4.7%
Mass of Lead on Untreated Solids	mg				362,500			
Mass of Lead on Solids in Centrate	mg							258,441
Mass of Lead on Treated Solids	mg							106,444
Mass of Lead in Liquids	mg				42,357			21,027

Concentration and Mass Balance Calculations for: Cadmium

Analytical Data			Unteated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment	PAQ	PSW
Concentrations in SL Samples									
Run V1	V1-SL-01 Sample	mg/kg	3.6	2.2	3.1	1.4	1.3	4.3	
Run V2	V2-SL-01 Sample	mg/kg	2.4	3.4	5.2	1.3	1.1	5.3	
Run V3	V3-SL-01 Sample	mg/kg	3.4	1.4	2.1	2.6	1.3	5.8	
Average		**mg/kg**	**3.1**	**2.3**	**3.5**	**1.8**	**1.2**	**5.1**	
Standard Deviation of SL Data		mg/kg	0.6	1.0	1.6	0.7	0.12	0.8	
Concentrations in AQ Samples									
Run V1	V1-AQ-01 Sample	ug/L	129	8.0	23.6	122		154	
Run V2	V2-AQ-01 Sample	ug/L	92	12.5	13.1	123		118	
Run V3	V3-AQ-01 Sample	ug/L	320	25.3	11.8	162		153	0.5 ND
Average		**ug/L**	**180**	**15.3**	**16.2**	**136**		**142**	**0.5**
Standard Deviation of AQ Data		ug/L	122	9.0	6.5	22.8		20.5	

ND = Not Detected, Half the Detection Limit Shown

Mass Balance Calculations		Process Inlets				Process Outlets		
		Untreated Sediment	Process Water	H_2O_2 Water	Total Process Inlets	Treated Sediment	Centrate	Total Process Oulets
Total Mass of Solids	lbs	5,102	-	-	5,102	3,455	1,647	5,102
Total Mass of Liquids	lbs	10,284	17,324	136	27,744	1,552	26,192	27,744
Concentration of Cadmium in Solids	mg/kg	3.1	-	-	-	1.23	5.1	NA
Concentration of Cadmium in Liquids	ug/L	180	1	-	-	-	141.7	NA
Mass of Cadmium on Solids	mg	7,250	-	-	7,250	1,933	3,834	5,767
Mass of Cadmium in Liquids	mg	841	4	-	845	-	1,683	1,683
Total Mass of Cadmium	mg	8,091	4	-	8,095	1,933	5,517	7,450
								-8.0%
Mass of Cadmium on Untreated Solids	mg				7,250			
Mass of Cadmium on Solids in Centrate	mg							3,834
Mass of Cadmium on Treated Solids	mg							1,933
Mass of Cadmium in Liquids	mg				845			1,683

Concentration and Mass Balance Calculations for: Benzo(a)pyrene

Analytical Data			Untreated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment	FAC	PSW
Concentrations in SL Samples									
Run V1	V1-SL-01 Sample	ug/kg	4,600	2,000	2,700	2,500	[illegible]	[illegible]	
Run V2	V2-SL-01 Sample	ug/kg	1,500	1,100	1,800	1,100	[illegible]	[illegible]	
Run V3	V3-SL-01 Sample	ug/kg	1,200	1,300	1,300	1,700	[illegible]	[illegible]	
Average		**ug/kg**	**2,433**	**1,467**	**1,933**	**1,767**	1,633	850	
Standard Deviation of SL Data		ug/kg	1,882	473	709	702	[illegible]		
Concentrations in AQ Samples									
Run V1	V1-AQ-01 Sample	ug/L	10 ND	10 ND	20 ND	20 ND			
Run V2	V2-AQ-01 Sample	ug/L	5 ND	5 ND	5 ND	5 ND			
Run V3	V3-AQ-01 Sample	ug/L	5 ND	5 ND	5 ND	5 ND		ND	5 ND
Average		**ug/L**	7	7	**10**	10		5	5
Standard Deviation of AQ Data		ug/L	3	3	9	[illegible]		[illegible]	

ND = Not Detected, Half the Detection Limit Shown

Mass Balance Calculations		Process Inlets				Process Outlets		
		Untreated Sediment	Process Water	H_2O_2 Water	Total Process Inlets	Treated Sediment	Centrate	Total Process Outlets
Total Mass of Solids	lbs	5,102	-	-	[illegible]	[illegible]	[illegible]	[illegible]
Total Mass of Liquids	lbs	10,284	17,324	136	[illegible]	[illegible]	[illegible]	[illegible]
Concentration of Benzo(a)pyrene in Solids	ug/kg	2,433	-			[illegible]	[illegible]	[illegible]
Concentration of Benzo(a)pyrene in Liquids	ug/L	7	5	-			[illegible]	[illegible]
Mass of Benzo(a)pyrene on Solids	mg	5,630	-	-	[illegible]	[illegible]	[illegible]	[illegible]
Mass of Benzo(a)pyrene in Liquids	mg	31	39	-	[illegible]	[illegible]	[illegible]	[illegible]
Total Mass of Benzo(a)pyrene	mg	5,661	39		[illegible]	[illegible]	[illegible]	[illegible]
Mass of Benzo(a)pyrene on Untreated Solids	mg				[illegible]			
Mass of Benzo(a)pyrene on Solids in Centrate	mg							[illegible]
Mass of Benzo(a)pyrene on Treated Solids	mg							[illegible]
Mass of Benzo(a)pyrene in Liquids	mg				-			

Concentration and Mass Balance Calculations for: Fluoranthene

Analytical Data			Untreated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment	PAQ	PSW
Concentrations in SL Samples									
Run V1	V1-SL-01 Sample	ug/kg	13,000	3,900	5,100	4,900	3,700	3,900	
Run V2	V2-SL-01 Sample	ug/kg	3,400	3,000	3,600	2,500	2,500	4,100	
Run V3	V3-SL-01 Sample	ug/kg	3,100	2,900	2,700	3,400	2,600	3,000	
Average		**ug/kg**	**6,500**	**3,267**	**3,800**	**3,600**	**2,933**	**3,667**	
Standard Deviation of SL Data		ug/kg	5,631	551	1,212	1,212	666	586	
Concentrations in AQ Samples									
Run V1	V1-AQ-01 Sample	ug/L	6.8	10 ND	20 ND	20 ND		1.4	
Run V2	V2-AQ-01 Sample	ug/L	2.5	5 ND	5 ND	1.3		1.2	
Run V3	V3-AQ-01 Sample	ug/L	7.0	0.95	5 ND	5 ND		5 ND	5 ND
Average		**ug/L**	**5.4**	**5.3**	**10**	**9**		**3**	**5**
Standard Deviation of AQ Data		ug/L	2.5	4.5	9	10		2	

ND = Not Detected, Half the Detection Limit Shown

Mass Balance Calculations		Process Inlets				Process Outlets		
		Untreated Sediment	Process Water	H_2O_2 Water	Total Process Inlets	Treated Sediment	Centrate	Total Process Oulets
Total Mass of Solids	lbs	5,102	-	-	5,102	3,455	1,647	5,102
Total Mass of Liquids	lbs	10,284	17,324	136	27,744	1,552	26,192	27,744
Concentration of Fluoranthene in Solids	ug/kg	6,500	-	-	-	2,933	3,667	NA
Concentration of Fluoranthene in Liquids	ug/L	5	5	-	-	-	2.5	NA
Mass of Fluoranthene on Solids	mg	15,040	-	-	15,040	4,596	2,739	7,335
Mass of Fluoranthene in Liquids	mg	25	39	-	65	-	30	30
Total Mass of Fluoranthene	mg	15,065	39	-	15,105	4,596	2,769	7,365
								-51.2%
Mass of Fluoranthene on Untreated Solids	mg				15,040			
Mass of Fluoranthene on Solids in Centrate	mg							2,739
Mass of Fluoranthene on Treated Solids	mg							4,596
Mass of Fluoranthene in Liquids	mg				65			30

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Concentration and Mass Balance Calculations for: Dioxin/Furan TEQ

Analytical Data			Untreated Sediment	Pre-Processor Outlet	Collision Chamber Outlet	Cav/Ox System Outlet	Treated Sediment	PAQ	PSW
Concentrations in SL Samples									
Run V1	V1-SL-01 Sample	pg/g	184.7				102.0	111.5	
Run V2	V2-SL-01 Sample	pg/g	99.0				75.8	119.0	
Run V3	V3-SL-01 Sample	pg/g	100.2				70.2	127.6	
Average		**pg/g**	**128.0**				**82.7**	**119.4**	
Standard Deviation of SL Data		pg/g	49.1				17.0	8.1	
Concentrations in AQ Samples									
Run V1	V1-AQ-01 Sample	pg/L	10,395					2,343	
Run V2	V2-AQ-01 Sample	pg/L	10,750					112	
Run V3	V3-AQ-01 Sample	pg/L	13,946					350	-
Average		**pg/L**	**11,697**					**935**	-
Standard Deviation of AQ Data		pg/L	1,956					1,225	

ND = Not Detected, Half the Detection Limit Shown

Mass Balance Calculations		Process Inlets				Process Outlets		
		Untreated Sediment	Process Water	H_2O_2 Water	Total Process Inlets	Treated Sediment	Centrate	Total Process Oulets
Total Mass of Solids	lbs	5,102	-	-	5,102	3,455	1,647	5,102
Total Mass of Liquids	lbs	10,284	17,324	136	27,744	1,552	26,192	27,744
Concentration of Dioxin/Furan TEQ in Solids	pg/g	128.0	-	-	-	82.7	119.4	NA
Concentration of Dioxin/Furan TEQ in Liquids	pg/L	11,697	-	-	-	-	935.0	NA
Mass of Dioxin/Furan TEQ on Solids	mg	0.296	-	-	0.296	0.130	0.089	0.219
Mass of Dioxin/Furan TEQ in Liquids	mg	0.055	-	-	0.055	-	0.011	0.011
Total Mass of Dioxin/Furan TEQ	mg	0.351	-	-	0.351	0.130	0.100	0.230
								-34.5%
Mass of Dioxin/Furan TEQ on Untreated Solids	mg				0.296			
Mass of Dioxin/Furan TEQ on Solids in Centrate	mg							0.089
Mass of Dioxin/Furan TEQ on Treated Solids	mg							0.130
Mass of Dioxin/Furan TEQ in Liquids	mg				0.055			0.011

APPENDIX F

ANALYTICAL DATA PACKAGES