

24 March 2003

SUBJECT: DETERMINATION ON THE SUITABILITY OF DREDGED MATERIAL RETESTED UNDER RECENCY FOR THE U.S. COAST GUARD, PIER 36 SLIP DREDGING CHARACTERIZATION (2003-2-00333), EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT (CWA) FOR OPEN-WATER DISPOSAL AT THE ELLIOTT BAY DISPOSAL SITE.

1. The following summary reflects the consensus determination of the Agencies' (U.S. Army Corps of Engineers, Department of Ecology, Department of Natural Resources, and the Environmental Protection Agency) with jurisdiction on dredging and disposal on the suitability for unconfined open-water disposal at the Elliott Bay disposal site of an estimated 11,580 cy of surface dredged material tested under recency guidelines as part of the U.S. Coast Guard Slip 36 Project.
2. **Background.** The high ranked Slip 36 was previously sampled and tested during 1998, and the total volume subject to DMMP evaluation at that time was 33,130 cy. The testing outcomes were summarized in a DMMP suitability determination dated 2 November 1999, where 17,340 cy were deemed suitable and 15,790 cy unsuitable for unconfined-open-water disposal. Of the suitable material, three Dredged Material Management Units (DMMUs) comprising 11,580 cy were located within the surface (0-4 feet) and one DMMU (5,760 cy) was located in the subsurface sediments (>4 feet). The DMMP agencies in letter dated January 31, 2002 (Attachment 1), stipulated that only the three surface suitable DMMUs were subject to recency retesting, which is summarized below.
3. Relevant dates for regulatory tracking purposes are included in Table 1.

Table 1. Regulatory Tracking Dates

DMMP Review/Recency Response letter on USCG Slip 36 1998 Characterization	January 31, 2002
SAP Submittal date:	October 4, 2002
Initial SAP Approval date:	October 24, 2002
Initial sampling date(s):	November 14, 2002
Characterization Report submittal date:	March 20, 2003
DAIS Tracking Number	CGS36-1-B-F-182
Recency Determination Date: High (2 years)	November 2004

4. This Recency testing SDM documents sampling collected for a total of 3 surface DMMUs located within the high ranked Slip 36 footprint within the East Waterway (Figure 1). The total dredging volume for the recency testing material is 11,580 cy. The targeted dredge depth for Slip 36 is to a design depth of -40 ft MLLW.

Sampling:

5. Sampling was initiated on November 14, 2002, and 10 sediment cores were collected by vibracorer within the three DMMUs (see Figures 1 for vicinity and 2 for sample core locations for DMMU's S61C, S62C, and S67C). Three samples were composited for DMMUs S61C and S62C, whereas DMMU S67C was comprised of 4 core stations. No Z-samples were collected and archived.

Therefore, the new surface following dredging of unsuitable DMMUs will have to be evaluated to verify compliance with the DMMP and Washington State Department of Ecology antidegradation policies.

6. The Agencies' approved sampling and analysis plan was followed, and quality assurance/quality control guidelines specified by the Puget Sound Dredged Disposal Analysis Users Manual were generally achieved. The data gathered were deemed sufficient and acceptable for decision-making by the Dredged Material Management Program (DMMP) agencies based on best professional judgment.

Chemical Testing:

7. Attachment 2 summarizes the sediment conventional, chemical, biological testing results and suitability determination outcomes for the three DMMUs evaluated. Chemical analysis of the three DMMUs indicated that all three DMMUs had exceedances of DMMP chemical guidelines, including Arsenic, Mercury (2), Acenaphthene, Fluorene, Anthracene, Fluoranthene, Pyrene (2), Total HPAHs, Total DDT (3), and total PCBs (3). Bioaccumulation Triggers were exceeded for DDT (S61C, S67C) and PCBs (S61C). Based on chemical testing results, all three DMMUs were subject to bioassay testing summarized below.

Biological Testing:

8. Standard bioassay testing was conducted on 3 DMMUs within the 56 day biological holding time. Table 2 summarizes the solid phase bioassay Quality Control (QC) performance guidelines and also summarizes the solid phase bioassay interpretative guidelines for nondispersive sites, which were used to evaluate the bioassay data presented below. Table 3 summarizes the batch specific bioassay toxicity testing outcomes for the 3 DMMUs tested. Two reference samples were collected from Carr Inlet to block for grain size effects. The percent fines of the two reference sediments were 19 and 60 percent, with the first reference used for S62C and the second used for S61C and S67C. In general, all negative control and reference sediments met the DMMP performance limits for each of the three bioassay tests to assess toxicity. Results for each bioassay test are summarized in Table 3 for the Slip 36 recency retesting area compared to the DMMP nondispersive interpretive guidelines. These bioassay results are discussed below.
 - a) **Amphipod Bioassay (*Eohaustorius estuarius*)**. Two of the three amphipod bioassay results showed toxicity, with S61C and S67C expressing a 1-hit response.
 - b) **Bivalve Larval Bioassay (*Mytilus galloprovincialis*)**. The results of the larval bivalve test showed low normalized combined % mortality/abnormality relative to the seawater control and reference sediments, and no toxicity was observed relative to reference sediment comparisons.
 - c) **Neanthes 20-day Growth Bioassay (*Neanthes arenaceodentata*)**. The results of the *Neanthes* growth bioassay (Table 3) showed no mortality in tested sediments, and no toxicity relative to the DMMP interpretive guidelines for mean individual growth.
 - d) **DMMP Bioassay Summary Determination**. Overall interpretation of the bioassay responses indicates that 2 of 3 DMMUs (S61C and S67C) failed the DMMP unconfined-

Table 2. DMMP EVALUATION GUIDELINES (BIOASSAYS)

Bioassay	Negative Control Performance Standard	Reference Sediment Performance Standard	Dispersive Disposal Site Interpretation Guidelines		Nondispersive Disposal Site Interpretation Guidelines	
			1-hit rule	2-hit rule	1-hit rule	2-hit rule
Amphipod	$M_C \leq 10\%$	$M_R - M_C \leq 20\%$	$M_T - M_C > 20\%$ and M_T vs M_R SD ($p=.05$) and		$M_T - M_C > 20\%$ and M_T vs M_R SD ($p=.05$) and	
			$M_T - M_R > 10\%$	NOCN	$M_T - M_R > 30\%$	NOCN
Sediment Larval	$N_{C+I} \geq 0.70$	$N_R \div N_C \geq 0.65$	$N_T \div N_C < 0.80$ and N_T/N_C vs N_R/N_C SD ($p=.10$) and		$N_T \div N_C < 0.80$ and N_T/N_C vs N_R/N_C SD ($p=.10$) and	
			$N_R/N_C - N_T/N_C > 0.15$	NOCN	$N_R/N_C - N_T/N_C > 0.30$	NOCN
Neanthes growth	$M_C \leq 10\%$ $MIG \geq 0.38$ mg/ind/day	$MIG_R \div MIG_C \geq 0.80$	$MIG_T \div MIG_C < 0.80$ and MIG_T vs MIG_R SD ($p=.05$) and		$MIG_T \div MIG_C < 0.80$ and MIG_T vs MIG_R SD ($p=.05$) and	
			$MIG_T/MIG_R < 0.70$	NOCN	$MIG_T/MIG_R < 0.50$	$MIG_T/MIG_R < 0.70$

M = mortality, N = normals, I = initial count, MIG = mean individual growth rate, BLD = blank-corrected light decrease
 SD = statistically different, NOCN = no other conditions necessary, N/A = not applicable
 Subscripts: R = reference sediment, C = negative control, T = test sediment

open-water disposal bioassay guidelines, while the remaining DMMU (S62C) passed the bioassay interpretative guidelines.

Table 3. Bioassay testing interpretation summary.

Amphipod Bioassay: (<i>Eohaustorius estuarius</i>) (% mortality)	S61C	S62C	S67C	Control	Reference CR-24W, CR-22S/CR-23W
	40 (1H)	12	62 (1H)	0	3 (CR24W) 4 (CR22S/23W)
Bivalve Larval Bioassay: (<i>Mytilus galloprovincialis</i>) (normalized combined % Mortality/Abnormality)					
	7.5	10.9	10.3	0	14.2 (CR24W) 5.8 (CR22S/23W)
Neanthes Growth Bioassay: (<i>Neanthes arenaceodentata</i>) % mortality, MIG					
	0, 1.15	0, 0.97	0, 0.90	0, 1.1	0, 1.14 (CR24W) 0, 0.1.15 (CR22S/23W)

Legend: MIG = mean individual growth

Suitability Determination

11. The DMMP agencies accepted the data as sufficient to make a suitability determination for open-water unconfined disposal. Attachment 2 summarizes the final suitability determination for each of the 3 DMMUs and summarizes the essential chemical and biological testing information forming the basis for these determinations.
12. A total of 3,880 cubic yards of U.S. Coast Guard Pier 36 recency recharacterization material in 1 of 3 DMMUs passed DMMP evaluation guidelines and are suitable for open-water disposal at the Elliott Bay non-dispersive site. The remaining two DMMUs, representing 7,700 cubic yards failed the bioassay interpretation guidelines and are unsuitable for open-water unconfined disposal based on best professional judgement.
13. This memorandum documents the suitability of the material tested during the U.S. Coast Guard Pier 36 recency recharacterization, for dredging and disposal at the Elliott Bay non-dispersive open-water disposal site. However, this suitability determination does not constitute final agency approval of the project. A dredging plan for this project must be completed as part of the final project approval process. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under Section 404(b)(1) of the Clean Water Act.

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Concur:

4/1/03

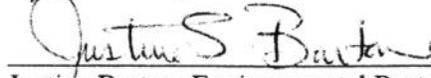
Date



David Kendall, Ph.D., Seattle District Corps of Engineers

4/14/03

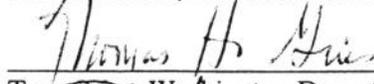
Date



Justine Barton, Environmental Protection Agency

4/1/03

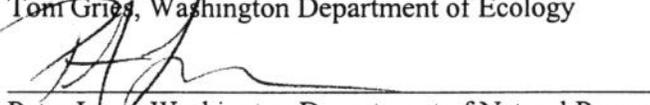
Date



Tom Gries, Washington Department of Ecology

4/2/2003

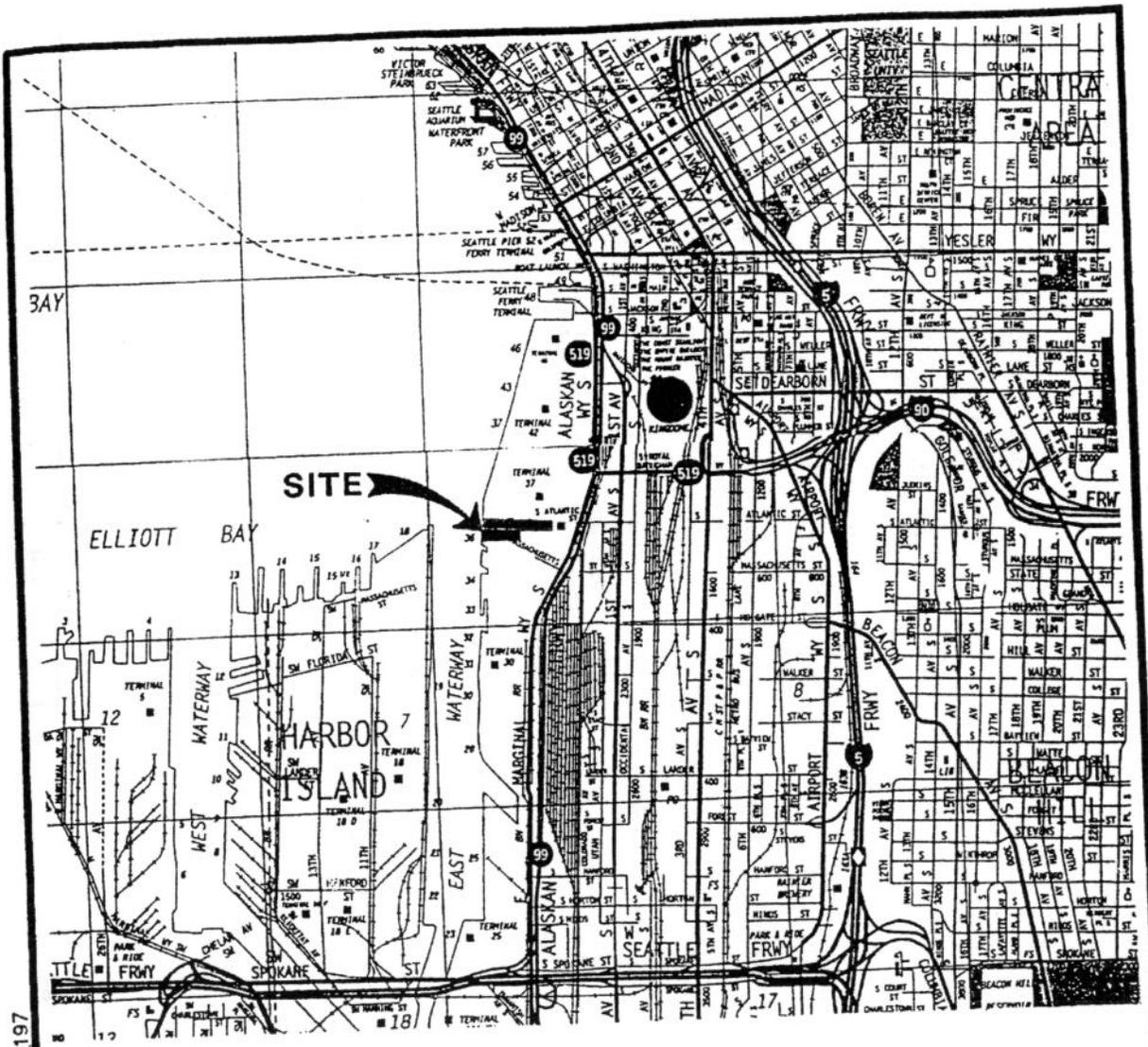
Date



Peter Leon, Washington Department of Natural Resources

Copies Furnished:

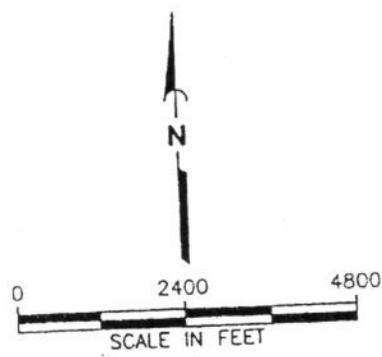
Suzanne Skadowski, Corps Regulatory
Justine Barton, EPA
Kevin Rochlin, EPA Superfund Project Manager
Tom Gries, Ecology
Peter Leon, DNR
John Vogel, U.S. Coast Guard
DMMO File



023402103:052197

8X11THOM.DWG

SLF:SPS



Reference:
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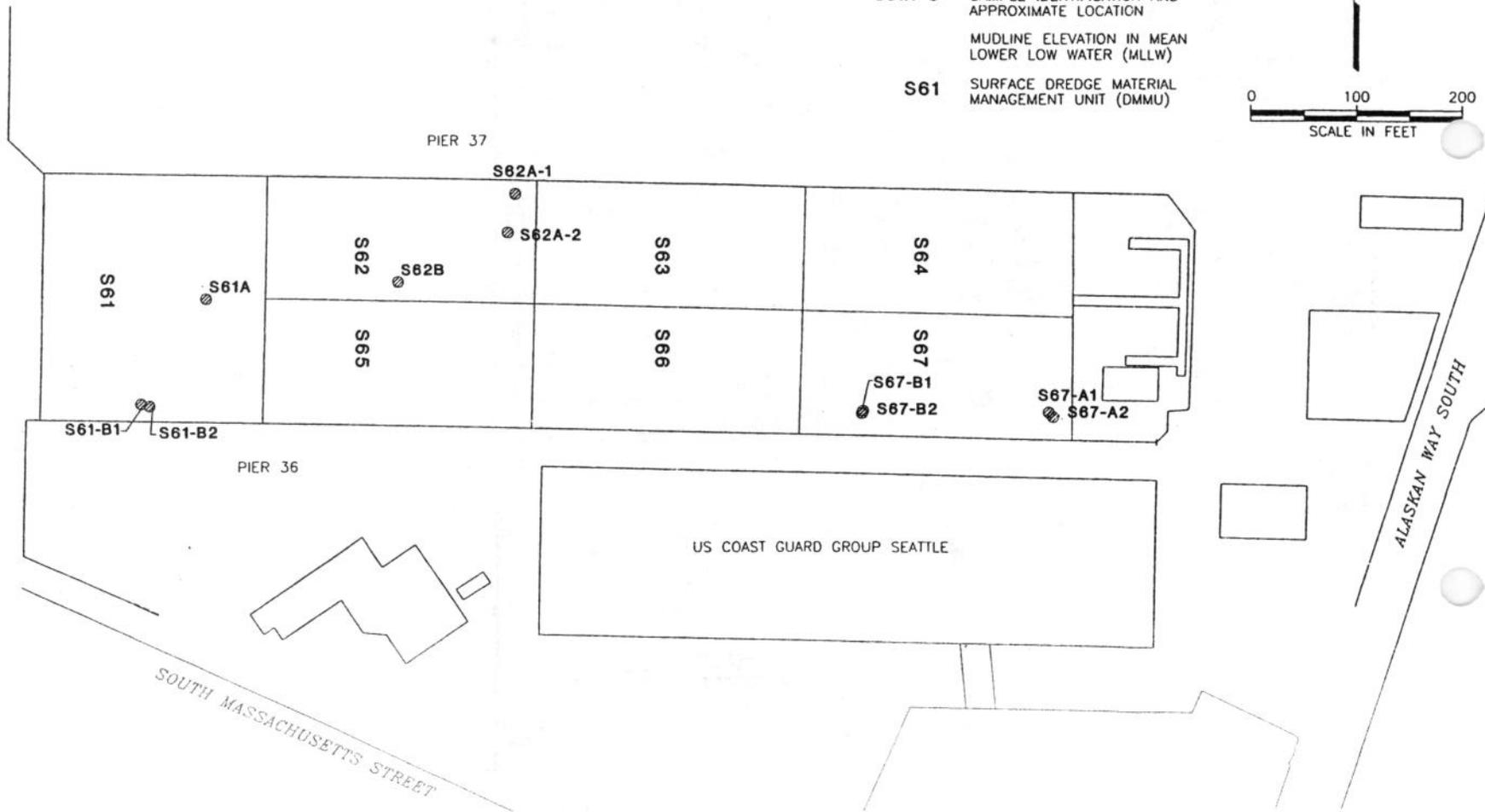
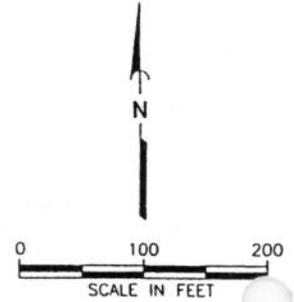
VICINITY MAP

Geo  Engineers

FIGURE 1

EXPLANATION:

- S61A ⊙ SAMPLE IDENTIFICATION AND APPROXIMATE LOCATION
- MUDLINE ELEVATION IN MEAN LOWER LOW WATER (MLLW)
- S61 ⊙ SURFACE DREDGE MATERIAL MANAGEMENT UNIT (DMMU)



- Notes: 1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.

Reference: Base drawing from AutoCAD file, "USCGPier37.DWG", provided by USCG.



SITE PLAN

FIGURE 2



DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

January 31, 2002

Operations Division/Technical Support Branch
Dredged Material Management Office

Commander R.F. Beseler
U.S. Coast Guard
Facilities Design and Construction Center Pacific
Jackson Federal Building
915 Second Avenue, Room 2664
Seattle, WA 98174-1011

Subject: East Waterway (Duwamish River) Channel Deepening Project

Dear Commander Beseler:

This letter provides the Dredged Material Management Program (DMMP) consensus response to your letter dated December 12, 2001. As you are probably aware data from a high ranked project area such as the U.S. Coast Guard Slip 36 deepening project has a 2-year recency timeline in the DMMP program. The data collection effort for the Slip 36 deepening characterization took place during August 1998, and therefore these data have now exceeded the 2-year recency guideline.

The DMMP agencies reviewed the sediment quality data collected in 1998 for the Slip 36 deepening project, including recently collected data (March 2001) for the Pier 36 rebuild / dredging project (berth alpha) to evaluate whether additional data collection efforts will be required to document whether surface sediment quality documented in the November 2, 1999 DMMP suitability determination memorandum have changed prior to dredging/construction. To accomplish this evaluation, the DMMP agencies have re-evaluated the initial data from surface sediments from within the Slip 36 dredging footprint, as well as sediment quality data collected from the adjacent Pier 36 rebuild project.

These data indicate that there are sediment quality concerns¹ in surface sediments underlying the existing pier, which are immediately adjacent to the western portion of the proposed dredging area for the Slip 36 deepening project. The existing sediment quality in the three surface Dredged Material Management Units (DMMU) that passed the DMMP open-water disposal guidelines during the 1998 characterization paralleled the chemicals observed underneath the Pier, suggesting that activities occurring at the Pier and adjacent properties are the probable source of the chemicals underneath the pier and adjacent to the pier in the proposed deepening area.

After reviewing these data, the DMMP agencies feel that some limited retesting of the three surface DMMUs passing the open-water disposal guidelines (e.g., DMMU S61, DMMU S62,

¹ Multiple chemical bioaccumulation trigger and maximum level exceedances for: TBT, Hg, DDT, Benzo(a)pyrene, Acenanthrene, Benzo(a)anthracene, and Fluoranthene, including screening level exceedances for PCBs, PAH's, Pb, and Zn.

and DMMU S67) is warranted. This recharacterization should include a surface chemical characterization for the DMMP chemicals of concern, including TBT. Biological testing will also be required if chemical guidelines are exceeded. A sampling and analysis plan documenting the surface resampling/testing approach should be submitted to the Dredged Material Management Office for DMMP review and approval before initiating the resampling effort.

Please call me (206/764-3768) if you have any questions about our response.

Sincerely,

David R. Kendall, Ph.D.
Chief, Dredged Material Management Office

Copies Furnished:
Justine Barton, EPA
Erica Hoffman, EPA
Rick Vining, Ecology
Robert Brenner, DNR
DMMO File

Attachment 2. U.S. Coast Guard Slip 36 Recency Characterization: PSSDA Evaluation Summary

CHEMICAL NAME	Units	SL	BT	DMMU ID			VQ	VQ	VQ	VQ	DMMU SL detection freq. #/3
				Rank:	S61C	S62C					
				ML	Conc.	Conc.	Conc.	Conc.	Conc.		
Arsenic	mg/kg	57	507.1	700					57.9		1
Mercury	mg/kg	0.41	1.5	2.3	0.48				1.24		2
Acenaphthene	ug/kg	500		2,000					740		1
Fluorene	ug/kg	540		3,600					550		1
Anthracene	ug/kg	960		13,000			1,300				1
Fluoranthene	ug/kg	1,700	4,600	30,000					2,000		1
Pyrene	ug/kg	2,600		16,000	3,300				4,800		2
Total HPAHs	ug/kg	12,000		69,000					13,440		1
Total DDT	ug/kg	6.9	50	69	68		26.0		68		3
Total PCBs	ug/kg	130		3,100	667		202		410		3
Total PCBs (TOC- normalized)	mg/kg		38		42		20		17		
Total Solids	%				64.6		74.1		61.7		
Total Volatile Solids	%				4.3		2.3		5.4		
Total Organic Carbon	%				1.57		0.99		2.4		
Total Ammonia	mg/kg				10.2		1.4		28.2		
Total Sulfides	mg/kg				667		146		1,010		
Gravel	%				4.3		0.3		1.6		
Sand	%				72.2		57.5		66.0		
Silt	%				16.9		32.9		27.3		
Clay	%				6.6		9.2		5.1		
Fines (percent silt + clay)	%				23.5		42.1		32.4		
preferred reference match:	%				20		43		43		
Eohaustorius estuarius hits:					1H				1H		
Mytilus galloprovincialis hits:											
Neanthes arenaceodentata hits:											
Bioassay Determination: (P/F)					F		P		F		
BTs exceeded:					yes		no		yes		
Bioaccumulation conducted:					no				no		
Bioaccumulation Determination:											
ML Rule exceeded:					no		no		no		
PSSDA Determination:					F		P		F		
DMMU Volume:	cy				3,830		3,880		3,870		Total Volume: 11,580
DMMU ID:					CG-S61		CG-S62		CG-S63		

Legend:

1H = one hit failure (DMMP Guidelines)
 UCOWD = Unconfined open-water disposal
BT = bioaccumulation trigger exceedance
 CG = US Coast Guard Slip 36 Characterization

Failed:
 Passed:

3,830			3,870	7,700	cy
		3,880		3,880	cy

Unsuitable for UCOWD: 66.5%
 Suitable for UCOWD: 33.5%