Appendix B

Memorandums For Record

CENAN-PP-H 22 March 2005

MEMORANDUM FOR RECORD

SUBJECT: Review and Comparison of Plaintiffs referenced data to sediment data from the Harbor Deepening Projects

1. NRDC, on behalf of four named plaintiffs (hereinafter identified as the "Plaintiffs"), filed a complaint against the United States on January 21, 2005. In their complaint and in a previous Notice of Intent (NOI) letter dated January 4, 2005, the Plaintiffs referenced sediment contamination data that they considered to be "new and significant" with respect to the continued deepening of selected federal channels within and leading from Newark Bay. Specifically, these two "new" sources of sediment contaminant data were the NYSDEC Contaminant Assessment and Reduction Project Report (CARP; 2003) and Tierra Solution's Newark Bay Study Area Inventory and Overview Report of Historical Data (Inventory Report; Tierra Solutions, Inc. 2004). This memorandum summarizes the evaluation and comparison of sediment contaminant data from these two sources to the sediment contaminant data collected by the New York District to obtain the Water Quality Certifications (WQCs) from the appropriate State regulatory agency(ies) as required by the Clean Water Act (the regulatory statute used to manage the dredging and disposition of material to be removed in the construction and maintenance of the federal navigation channels in the Port of New York and New Jersey).

2. For purposes of this evaluation, and due to the large number of possible contaminants that can be found within the recently deposited sediments in the estuary, this evaluation was limited to polychlorinated dioxins and furans based upon the Plaintiffs comment (page 3, paragraph 7 of NOI) that dioxin levels are "of particular note". Further, given that the Plaintiffs' complaint references the designation of the Newark Bay as a new study area related to the Diamond Alkali Superfund Site, this evaluation was limited geographically to the area that defines the Newark Bay Study area (i.e., the evaluation ends at the Bayonne and Goethals Bridges). Lastly, as described in the Corps' Final Environmental Impact Statement for the NY & NJ Harbor Navigation Study (Dec 1999), the top layer of sediment to be removed from construction of the project is expected to be relatively recent deposits of material resuspended from areas nearby or adjacent to the channel since that area of the channel was last dredged. For this reason, surficial sediment contaminant data from the Plaintiff's referenced data from areas within and adjacent to the federal channel construction boundaries were used in this analysis. Similarly, the sediment composite test data for the material to be dredged from the federal channel construction were included in this analysis. Sediment composites are based on testing a mixture of one to three cores of the full thickness of sediment strata being evaluated – in this case, the top layer of silty sediment – so that they are most representative of the material that is proposed to be dredged.

3. To be complete and fully considerate of the potential toxic effects from all 17 congeners of dioxins/furans, the sediment contaminant data were evaluated using the Toxicity Equivalence Quotient (TEQ) for the various data points in the Newark Bay and Passaic River to the extent that data for the 17 congeners were available. This process involved computing the total toxicity of all the congeners for each sample by applying the Toxic Equivalency Factors (TEF) as accepted by the World Health Organization in 1998. Calculating the dioxin TEQ involved multiplying the concentrations of individual congeners by their respective TEF, then adding the individual TEQ's to obtain a total dioxin TEQ concentration. Dioxin TEQs were computed for all surficial sediment data and for the composite sediment samples tested by the USACE for the three current federal channel deepening contracts that fall within the Newark Bay study area.

4. The Plaintiff's referenced Inventory Report is a recent compilation of data from 26 previous sediment contaminant data collection efforts performed from 1990 to 2000 in the Harbor area. Therefore, the data contained in this report are not considered "new". Of these, only 8 sampling efforts had data points that fell within the boundaries of the federal channel deepening construction (i.e., the channel bottom and side slope). Also, we included five other sampling efforts in our analysis that were not included in the Inventory Report. These sampling efforts were documented in the NYSDEC CARP data report (2003), Tierra's 1994 CSO Study, and the three USACE sampling events for the WQCs (2004). On a related note, the Corps has been a proponent of and actively involved in the CARP program for several years (e.g., the Corps is a CARP Management Committee member). In fact, early in the program, the Corps provided sediment data management and collation support to the program. Consequently, the plaintiffs' referenced data were previously known by and available to the Corps.

5. The enclosed figure entitled "Dioxin Toxicity Equivalency Quotient (TEQ) in Surficial Sediments and Navigation Channel Deepening Contract Upland Placement Evaluation Composites" illustrates the TEQ dioxin sediment contaminant concentration of the surficial samples from all available sediment contaminant data collection efforts as well as the composite concentration of material tested for the three current federal channel deepening construction contracts. While no standard dioxin sediment contamination guideline or criteria has been developed for Passaic River or Newark Bay sediments, the sediment data points with concentrations higher than the upland "action level" of 1,000 parts per trillion are denoted in red with black outline. The other enclosed figure entitled "Sediment Core Location and Depth for Soft Silts/Clays Evaluated for Potential Upland Placement" illustrates the number and depth of cores taken for use in preparing the sediment composites tested to evaluate the material from the three current federal channel deepening construction contracts.

6. As noted above, of the 26 sediment sampling efforts that had data available for review (see Table 1), only 8 had data points within the federal channel construction boundaries (shown in bold on Table 1). Aside from the three sediment sampling efforts performed by the USACE for the WQCs for the three current federal channel deepening

construction contracts, the most recently collected surficial sediment contaminant data characterized by the Plaintiffs as "new" that fell within the federal channel construction boundaries were from 1998.

Table 1: Sampling Efforts Considered in the Analysis

	Sampling Event**	**Study Agency**
1	EPA Surficial Sediment 1993	EPA
2	Maxus Passaic R. CSO Study, 1994	*Maxus Energy Corporation
3	Maxus Passaic R. Sediment Study, 03/93	*Maxus Energy Corporation
4	Maxus Passaic R. Sediment study, 07/93	*Maxus Energy Corporation
5	Maxus Passaic R. Sediment Study, 1990	*Maxus Energy Corporation
6	**Maxus Passaic R. Sediment Study, 1991**	*Maxus Energy Corporation
7	**Maxus Passaic R. Sediment Study, 1992**	*Maxus Energy Corporation
8	Minish Park Monitoring 1999-2000	*Tierra Solutions
9	**Newark Bay Elizabeth Channel 1998**	*Tierra Solutions
10	Newark Bay Reach A 1996	*Tierra Solutions
11	Newark Bay Reach B, C, D 1997	*Tierra Solutions
12	Newark Bay Reach ABCD 1999	*Tierra Solutions
13	**NOAA NS&T Hudson-Raritan Phase II, 1993**	NOAA
14	Passaic R. EcoRisk 1999	*Tierra Solutions
15	Passaic R. EcoRisk 2000	*Tierra Solutions
16	Passaic R., EPA RI, 1995	*Tierra Solutions
17	Passaic R., EPA RI, 1995, Maxus Sup.	*Tierra Solutions
18	Passaic R., EPA RI, 1995, Nearshore Sup.	*Tierra Solutions
19	REMAP, 1993-94	EPA
20	**REMAP, 1998**	EPA
21	Sediment Grab Sampling 1995	*Tierra Solutions
22	Sediment Sampling 1999	*Tierra Solutions
23	CARP 1999-2001	NYSDEC
24	**USACE Arthur Kill Samples for WQC**	USACE
25	**USACE Newark Bay Samples for WQC**	USACE
26	**USACE Kill Van Kull Samples for WQC**	USACE

* Tierra Solutions is a subsidiary of the Maxus Energy Corporation, both of which are named as Responsible Parties in the Diamond Alkali Site, Passaic River Directive (NJDEP 2003).
** Boldfaced events include data points that fall within the boundaries of the federal channel deepening construction in the Newark Bay Study area.

7. Fifty-eight (58) data points from the 8 sampling efforts fell within the federal channel deepening construction boundaries. This included 22 data points from the Plaintiff's referenced data and 36 sediment composites taken by USACE for the WQCs.

8. Of the 22 data points from the Plaintiff's referenced data, all were collected in or prior to 1998. Since federal channel deepening construction has subsequently occurred in the same locations that 16 of these sediment samples were taken, these sediment sample data points are no longer valid. Consequently, only 6 data points from the Plaintiff's referenced sampling efforts that were taken in the Arthur Kill Area 2/3 contract could be argued to still be valid or representative of the sediment contamination that exists at their respective locations.

9. Table 2 shows the surficial sediment dioxin TEQ concentrations in parts per trillion (dry weight basis) from the Plaintiffs' referenced data that fall within the federal channel construction boundaries (i.e., channel bottom and side slope). Table 3 shows the sediment composite concentration in parts per trillion (dry weight basis) from the three current federal channel deepening construction contracts that fall within the Newark Bay study area.

Table 2: Dioxin TEQs for surface sediment samples within the Federal channel construction boundaries

Study	Sample date	TEQ (PPTr)*	Status**
Maxus Passaic R. Sediment Study, 1992	12/1/1992	1.12	Dredged
Maxus Passaic R. Sediment Study, 1992	12/1/1992	4.11	Dredged
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	7.86	Existing
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	24.1	Dredged
Maxus Passaic R. Sediment Study, 1991	12/2/1991	25.62	Dredged
REMAP 98	8/18/1998	29.15	Dredged
REMAP 98	8/17/1998	33.87	Existing
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	58.07	Dredged
Newark Bay Elizabeth Channel 1998	4/7/1998	62.83	Dredged
Maxus Passaic R. Sediment Study, 1991	11/19/1991	65.8	Existing
REMAP 98	8/15/1998	68.62	Dredged
REMAP 98	8/15/1998	72.73	Dredged
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	85.72	Existing

NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	87.02	Dredged
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	89.16	Dredged
Maxus Passaic R. Sediment Study, 1992	12/1/1992	98.41	Dredged
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	102.24	Existing
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	103.64	Dredged
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	110.79	Existing
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	124.14	Dredged
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	142.84	Dredged
NOAA NS&T Hudson-Raritan Phase II, 1993	Jan-93	296.55	Dredged
		Mean = 77.0	
		Standard Deviation = 63.3	

* - PPTr: part per trillion (ng/kg dry weight)
* * - "Dredged" denotes a location that has been dredged since the sample was collected, whereas "Existing" denotes a location that may not have been dredged for federal navigation channel deepening.

Table 3: Dioxin TEQs (PPTr) for sediment composite samples within the Arthur Kill, Newark Bay and Kill Van Kull Federal Channel Deepening Boundaries

AK 2/3 (2003) 20 Composites	S-NB-1 (2004) 10 Composites	S-KVK-2 (2004) 6 Composites*
21.56	8.42	16.49
28.7	10.42	23.46
37.73	16.67	23.63
50.24	24.4	26.6
53.35	27.12	84.53
59.95	27.19	161.82
61.32	29.33	-
66.78	32.21	-
71.06	44.94	-
88.5	197.36	-
97.07	-	-
100.36	-	-
100.88	-	-
105.32	-	-
105.86	-	-
108.43	-	-
146.1	-	-
152.53	-	-
153.4	-	-
273.26	-	-

Mean = 73.25
Standard Deviation = 60.23

* - Composites shown for S-KVK-2 are those that fall within the Newark Bay study area.

10. While Table 2 and 3 show that sediment contaminant concentration of dioxin in TEQ can vary considerably, the average and standard deviation of the surficial sediment concentration from the Plaintiff's referenced data that fall within the federal channel deepening boundaries are remarkably similar to that of the three federal channel deepening construction contract composites, which is in accordance to the Corps' NEPA evaluation referenced above.

11. In terms of significance of the Plaintiffs' referenced data to the continued deepening of the federal navigation channels in the Newark Bay study area, two key questions must be addressed: a. Are the data relevant to the action proposed? and b. Are the data substantially dissimilar to what was expected or tested as part of the proposed action?

a. As to the first question of whether the Plaintiffs' referenced data are relevant, it is only relevant indirectly, if at all, because the data are not sufficiently representative or recent enough for the involved regulatory agency(ies) to use in making a determination of suitability to dredge and place the material at the proposed upland beneficial use location(s) (as prescribed by the CWA). As background, characterization of each sediment strata in each dredging contract (regardless of whether it is federal or non-federal, maintenance or deepening), is fully and thoroughly evaluated by the involved regulatory agency(ies) just prior to the proposed construction action commencing in accordance with the sampling and testing methods established for the ultimate placement site proposed for the material. In this case, the top layer of recently deposited silty material from each federal channel deepening contract that is proposed to be dredged and processed with approximately 8% Portland cement or other acceptable admixture to make it structurally suitable for beneficial use as grading material for a permitted upland landfill and/or brownfield remediation effort. For this type of proposed placement site, involved state regulatory agencies require extensive coring, compositing and testing of the top silty sediment strata for bulk sediment chemistry (both before and after being processed with the proposed admixture material) as well as extensive leachate testing to ensure that the contaminants remain bound to the sediment matrix once placed at the proposed upland site(s). Therefore, the Plaintiff's referenced data is not considered directly relevant to evaluating the proposed action of deepening the federal navigation channels. Rather, general data such as this, albeit already considered by the Corps, may be indirectly relevant in the same way that knowledge of nearby point source discharges or possible contaminant sources may help to better refine and focus the development of a thorough and detailed sampling plan for the material proposed to be dredged.

b. Regarding the second question, the TEQ dioxin concentration of the Plaintiffs' referenced data are remarkably similar to that of the three current federal deepening contracts that fall within the Newark Bay study area as noted in paragraph 10. One should note that the average concentration of either table 2 or 3 is over 12 times less contaminated than what would be considered at the "action level" were the sediments an upland soil material subject to Superfund cleanup, and the highest measured data point is over three times less. Of course, Superfund cleanup criteria that may be established for contaminated sediments in the Newark Bay study area may differ substantially from that which was used for upland contaminated soils at the Diamond Alkali site. However, since the top layer of recently deposited soft silty sediment within the federal channel deepening construction contract areas is generally proposed for placement at a fully permitted upland beneficial use site, the established soil "action level" is of regulatory importance. Also, in recent years when a private permit applicant had proposed dredging material from their berthing area within Newark Bay that was above the upland soil "action level", it was found to be acceptable to be dredged and disposed into the Newark Bay Confined Disposal Facility (NBCDF), an open-water dredged material disposal site that was permitted to and constructed by the Port Authority of New York and New Jersey in the late 1990's and continues to be in operation in Newark Bay.

12. The sediment composite data from two of the three current federal channel deepening construction contracts have been examined by NJDEP and NYSDEC prior to issuance of the Water Quality Certifications. Water Quality Certifications for Arthur Kill (Contract Area 2/3) and Kill Van Kull (S-KVK-2 Contract Area) were issued in 2004. The Water Quality Certificate for the Newark Bay (S-NB-1 Contract Area) is pending.

13. In reviewing the Inventory Report and presentations of it prepared by Tierra Solutions, a subtle yet clear implication is made that contaminant "hot spots" lie within the Port areas of Newark Bay. The statistical analyses used by Tierra Solutions to support this view appears to derive largely from a single, rather anomalous, sediment sample that had a concentration of 6,200 parts per trillion of 2,3,7,8 TCDD. This sample was collected next to the bulkhead in the Port Newark Channel, an area NOT included within the current federal channel deepening project. Tierra Solutions further reinforces this implication by proposing (as noted by the Plaintiffs in footnote 6. on page 6. of the NOI) that 22 of the 31 sediment cores to be collected as part of the Newark Bay study area Work Plan be taken from within the existing channels and/or side slopes. Tierra Solutions' evaluation of existing data and their apparent omission in contrasting recently dredged/deepened channels with those which have not been dredged in decades is questionable in purpose and intent. Further, Tierra Solutions' draft Work Plan proposes to exclude large areas known to be depositional in Newark Bay because of the single permitted, constructed and operational NBCDF, which comprises a considerably smaller area than that which Tierra Solutions proposes to exclude. These factors along with the potential ulterior motive related to their culpability, raises serious and substantial concerns regarding the implications and observations of Tierra Solutions.

14. In a letter dated September 28, 2004 and included in as Attachment 17 in the NOI, three of the four entities comprising the Plaintiffs raised similar concerns regarding the Tierra Solutions' draft Inventory Report and Work Plan. In this letter, NRDC and the

Baykeeper highlighted that "… the Inventory Report offers only a cursory mention of relevant studies and data." They further commented "The Inventory Report omits, or misrepresents, several key post-1990 studies." Regarding the presentations made by Tierra Solutions, NRDC and Baykeeper also commented "Unsurprisingly, these "analyses" pointed in the direction of Tierra's non-culpability for contamination in Newark Bay, Arthur Kill, and Kill van Kull." NRDC and the Baykeeper further commented "…the statistical analyses underlying these "observations" – which were repeated so often as to give the impression that Tierra would have the listener accept them as "conclusions" – were based on extremely small data-sets."

15. The Plaintiffs' view of Tierra Solutions draft Inventory Report and Work Plan are, at best, inconsistent and confusing, and at worst, contradictory. Seemingly, NRDC and Baykeeper criticize the Tierra Solutions documents as being "cursory" and based upon "extremely small data-sets" when commenting to EPA. Yet, the Plaintiffs' remark in their complaint that the Inventory Report is "…a significant new compilation…" and that it "…includes substantial new sediment data…" even though, as explained above, the Plaintiffs' referenced data that falls within the boundaries of the federal channel deepening in the Newark Bay study area are not new, anomalous or even directly relevant to the NEPA and regulatory evaluation of the material proposed to be dredged from construction of the federal channels. Further, the NRDC and Baykeeper noted in their letter of September 28, 2004 to EPA, the "ongoing and future dredging in the study area." and that "the Corps of Engineers is in the midst of undertaking the nation's largest port deepening project, in New York Harbor, including deepening the navigation channels in Newark Bay, Arthur Kill, and Kill van Kull to fifty (50) feet." Whereas in the complaint, the Plaintiffs' refer to the deepening as "planned" and "poised … to begin…" Clearly, concerns regarding possible ulterior motives relate not just to Tierra Solutions.

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Project Manager

Enclosures:

1. Figure entitled "Dioxin Toxicity Equivalency Quotient (TEQ) in Surficial Sediments and Navigation Channel Deepening Contract Upland Placement Evaluation Composites"
2. Figure entitled "Sediment Core Location and Depth for Soft Silts/Clays Evaluated for Potential Upland Placement"

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U.S. Army Corps of Engineers (USACE). 2004. Technical Report on the Sampling and Testing of Sediment from Arthur Kill Contract Area 2/3 for Upland Beneficial Use in New Jersey and/or New York. Prepared by Aqua Survey, Inc. Flemington, NJ, for USACE.

Addendum to Appendix B – specifically the Memorandum For Record titled, "Approaches on Minimizing Resuspension of Sediment in Dredging through the use of Best Management Practices"

It has been suggested by some interested parties that the USACE should consider using specific alternative dredging methods to further control the resuspension of contaminated sediments and thereby lessen the potential adverse impacts on the RIWP study goals. Those suggested alternatives include, among other things:

(1) outfitting dredging equipment with software and electronic sensors to control the vertical and horizontal placement of the environmental bucket, including a DGPS system (for horizontal placement) and acoustic or electro-mechanical bucket placement sensors (for vertical placement);
(2) using a "rinse tank" between dredging cycles whenever dredging occurs within areas demarcated as essential fish habitat;
(3) using a closed environmental clamshell bucket "to refusal" whenever dredging in Holocene slit and clay;
(4) imposing a "no barge overflow" requirement when dredging Holocene silt and clay; and
(5) using appropriate adaptive management practices whenever USACE monitoring determines that resuspension of contaminated sediment occurs above a certain performance standard.

The subsequent MFR discusses BMP alternatives inclusive of those listed above as well as other alternative methods aimed at minimizing sediment resuspension due to dredging.

In light of the determination in this EA that the HDP, as currently designed, will have an insignificant affect on the RIWP study goal, further modification to the HDP's best management practices already mandated by the state regulatory agencies as part of the Section 404 Water Quality Certification process is unnecessary. Nevertheless, the USACE has considered these suggested alternatives, as well as the "no action" alternative, and has determined that they are either already being used, are inappropriate for navigational dredging, or would unnecessarily increase the cost and time to complete the project with only a modest, if any, decrease in the already insignificant affects on the RIWP study goals.

In any event, the USACE, through the use of its extensive environmental monitoring program and its ongoing coordination with USEPA and the trustees, will, as appropriate, reevaluate the need of altering its dredging methods within the Newark Bay Study Area to minimize to the fullest extent practicable any adverse affects to RIWP study goals.

As discussed in Appendix D2 Inspections, Section 1.4 Virtual Inspection, "In addition to the on-site inspections performed by Government and Contractor personnel, virtual inspection through webcam(s) shall be available to Government and regulatory agency personnel."

CENAN-EN-MM 15 December 2005

MEMORANDUM FOR Record

SUBJECT: Approaches on Minimizing Resuspension of Sediment in Dredging through the use of Best Management Practices

1. Resuspension of material has long been an issue as it may negatively impact the environment and its organisms due to increased turbidity and total suspended solids (TSS). For the sake of perspective some background information on turbidity and the New York Harbor is provided.

Figure 1. Comparison of dredge and vessel induced turbidity in Elizabeth Channel 28 Dec 2001.

a. Data on turbidity and TSS was collected in Newark Bay between March 2001 and March 2002. Data was also collected after a storm on 25 May 2001.[1] Data was also collected after the passage of a container ship and in the vicinity of ongoing dredging.[2]

[1] 2001 Total Suspended Sediment and Turbidity Monitoring in Newark Bay, Kill van Kull and Port Jersey, November 2002 pages 6-7

[2] Ibid page 7

b. To establish the ambient TSS level, samples were taken between March 2001 and March 2002. These samples varied between 3.3 mg/L and 40.0 mg/L at the surface and 4.3 mg/L and 43.7 mg/L at the bottom.3

c. Post storm samples showed a TSS that varied between 7.7 mg/L and 12.3 mg/L at the surface and 11.0 mg/L and 27.0 mg/L at the bottom.4

d. TSS values following the passage of container ships at the surface was 14.1 mg/L to 952.0 mg/L and at the bottom 10.0 mg/L to 797.0 mg/L.5

e. On 26 April 2001, samples were taken from 100 m up-current to 300 m down-current during the dredging of rock. Sampled TSS levels were found to be within ambient levels.6

f. On 14 November 2001, samples were taken during the dredging of fine material from Elizabeth Channel using a similar protocol to the rock dredge. TSS values were between 12.3 mg/L and 30.0 mg/L at the surface and 8.0 mg/L and 78.0 mg/L at the bottom7.

g. The study found that:

> *Close to the dredging operation, TSS was elevated with bottom values being the greatest. TSS values dropped off quickly with distance downstream from the dredge, with mid-water values decreasing to a lesser degree than those on the bottom. At the last two sampling stations (those furthest from the dredge), TSS values observed at the mid-water column stratum were slightly higher than those at the bottom.*[8]

2. When dredging fine sediment the Corps is required, and advocates the use of "best management practices" (BMPs) to reduce the resuspension of material.

3. Typical BMPs as identified by the States of NY and NJ from Arthur Kill 2/3 Contract are attached.

4. Broadly speaking, BMPs fall into two categories. The first are those that reduce the amount of resuspension, the second are those that ameliorate the impacts of resuspension via scheduling.

5. The following addresses those BMPs that reduce the amount of resuspension.

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[3] Ibid, page 8
[4] Ibid
[5] Ibid
[6] Ibid page 15
[7] Ibid table 12
[8] Ibid page 15

a. Environmental buckets:

i. Environmental buckets are those that are designed specifically to dredge soft sediments. They are routinely specified by the New York District for material that fine-grained (such as recent silts) in nature. As well they are widely used in industry for remedial and HTRW dredging.[9]

ii. Typically environmental buckets are lightweight and without teeth so as to minimize overdredging. They have a variety of flaps and seals to minimize return of sediment to the water column during hoisting and placement.

iii. Typical New York District specification language for an environmental bucket, taken from Arthur Kill 2/3 Contract section 02900 paragraph 6.3 follows:

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a. The bucket shall be provided with welded steel covers
and rubber seals specifically designed and installed by
the bucket manufacturer to minimize leakage from the
closed bucket.
b. The closed bucket shall be equipped with vertical side
plates, with rubber seals, which overlap or some method
to reduce sediment loss at closure and shall act as an
enclosure to eliminate redeposit of soil from the bucket.
c. The bucket shall be equipped with a switch, with
signal light in the control station, to verify bucket
closure and seal.
d. The bucket will be designed to produce a flat cut and
to minimize resuspension during closing and lifting.

A shop drawing of the contractor's bucket shall be
provided to the Contracting Officer for approval prior to
the commencement of dredging.
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[9] The Cable Arm Clamshell: Development and Track Record for Environmental Dredging; Bergeron, R.E., Cushing, B.S., Hammaker, M.K.

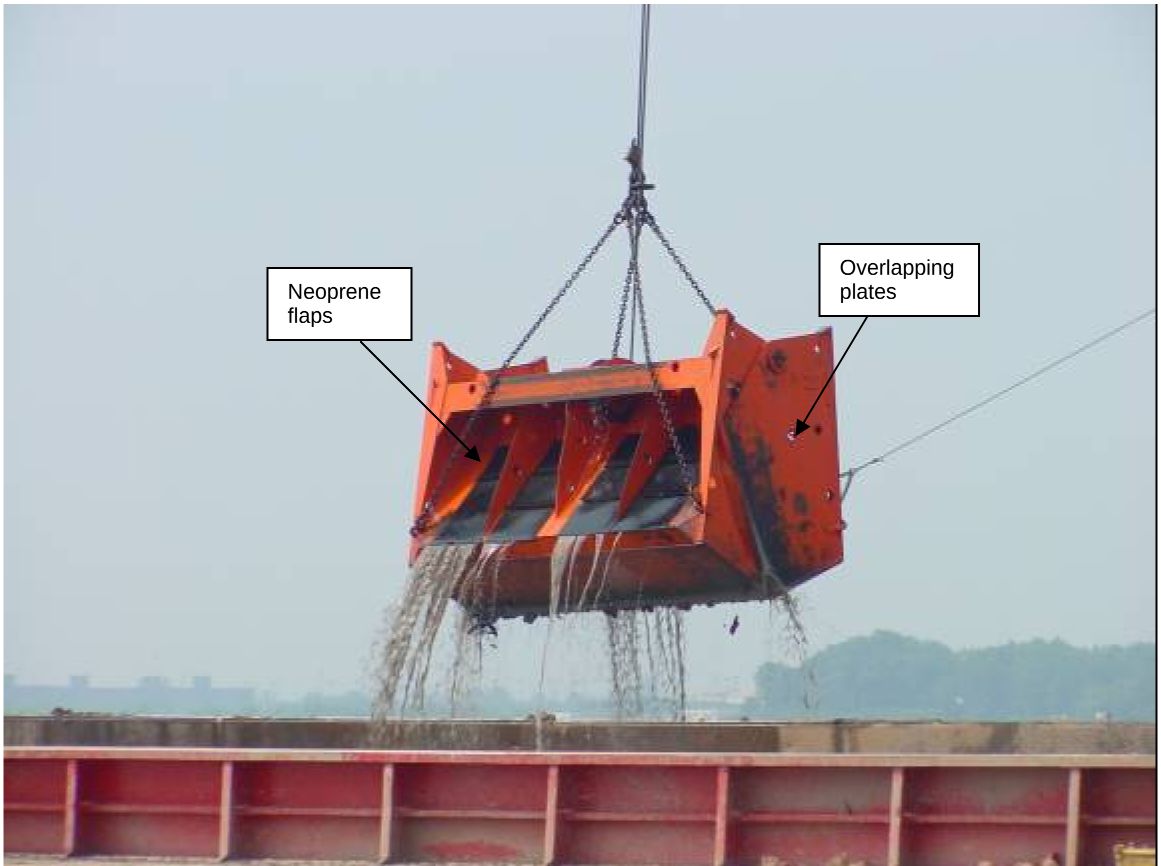

Figure 2. Typical clamshell environmental bucket.

iv. Figure 2 is of a typical clamshell environmental bucket. This particular unit was manufactured by "Cable Arm Inc.", a major manufacturer of this type of bucket. Note the neoprene flaps that close during hoisting to minimize resuspension, the overlapping side plates, and the lack of teeth. The flaps let water out from the top of the bucket while allowing silt to collect in the bottom of the bucket. This type of bucket is commonly used in New York Harbor for dredging fine sediments unsuitable for placement at the HARS. Studies have found such a bucket to be effective in reducing resuspension[10]

[10] Op Cit Bergeron

Figure 3. Typical backhoe environmental bucket.

v. Figure 3 is a backhoe dredge with an environmental bucket. In this type of operation, the bucket is rotated against the sealing plate before the arm is lifted. In conversations with the regulatory community, this type of bucket has received positive comments. It is, however, prone to having the sealing flap, which juts out, damaged. This type of bucket is therefore uncommon, and has only been used on this one dredge, Bean Dredging's "Maricavor".

b. Positioning software and sensors:

i. The proper use of an environmental bucket involves balancing two needs. On the one hand one wants to maximize the bite so as to reduce the number of passes required, as each pass will resuspend some material. On the other hand the bucket must not be overfilled so as to avoid losing material through the vent flaps.

ii. Two of the tools that are used to accomplish this are the use of positioning software and the use of depth and penetration sensors.

iii. Positioning software combines global positioning satellite (GPS) data with sensors that monitor the position of the crane and how much cable has been spooled out to give an accurate position for the bucket. This information is then compared to survey data to show the bucket in relation to the silt/water interface, and allows the operator to carefully position the bucket. Depth and penetrations sensors can be added to the bucket. This was recently done, for example, for the Lower Passaic Cleanup Pilot Study. However, according to a manufacturer of the sensors and software, the use of sensors has largely been replaced by the current generation of positioning software, as it can accomplish a similar accuracy more efficiently. An additional type of sensor is one that reports whether the bucket has closed properly. The use of such a sensor is already required on the HDP.

iv. At this time the use of positioning software isn't required in our navigational dredging contracts and would be worth further investigations as to the industry standard for such practices. Upon conclusion of this effort appropriate specification language will be drafted for future HDP contracts that are within the NBSA.

c. Use of an environmental bucket in HARS suitable silt and clay

i. While generally used in soft non-HARS suitable Holocene silt and clay an environmental bucket can be used in soft HARS suitable Holocene silt and clay too.

ii. Our experience, however, is that the bucket cannot dig material stiffer than "weight of rod" material.

iii. There is some precedent for the State of New Jersey requiring the use of an environmental bucket in HARS suitable Holocene silt and clay.11

iv. A review of the HDP subsurface information indicates that there is only one area in the Newark Bay Study Area (NBSA) where it's possible to encounter unconsolidated HARS suitable silt and clay, the South Elizabeth Channel widening. If such material is found during design then the appropriateness of this BMP will be discussed with the State of New Jersey.

[11] New Jersey Water Quality Certificate 0900-04-0003.1 WFD 040001, page 4

d. Rinse tank

Figure 4, A rinse tank being used on the Lower Passaic Pilot Study

i. A rinse tank is a large container of water that the open bucket can be dipped in after emptying its load. This reduces the amount of material adhering to the bucket that can then reenter the water column.

ii. Use of a rinse tank can increase “cycle time” (cycle time is how long an entire digging cycle takes, lowering the bucket, digging, raising the bucket, emptying the bucket, etc, etc, and then finally the start of lowering it again). When I observed the Lower Passaic Cleanup Pilot dredging, rinsing added approximately one minute to the dredging cycle.12 A typical cycle time on our project is only 90 seconds so this would be a significant impact on the project. Any benefit from the use of a rinse tank would need to be balanced against the increased air pollution (particularly NOx as the HDP is in a non-attainment area) from running the engines longer.

iii. Communication with Ray Bergeron, a manufacturer of rinse tanks, environmental buckets, and software he wrote:

> *a rinse tank is indicated for sticky material that has a high level of contamination. For example, in Lower Passaic the mud is likely sticky and has a high levels of contamination. The material in the Newark Bay Study Area that we have tested to date do not show high levels of contamination, and have not heretofore had any special management practices required by the regulatory agencies*[13]

iv. Any benefit from the use of a rinse tank would need to be balanced against the increased air pollution (particularly NOx as the HDP is in a non-attainment area) from running the engines longer.

e. Bucket speed

[12] Memorandum For Record, Subject *Field Visit to Lower Passaic Cleanup Pilot Dredging* by Steven Weinberg
[13] 28 Sep 2005 email from Ray Bergeron to Steven Weinberg

i. Part of the proper operation of an environmental bucket is controlling its ascent and descent speeds.

ii. Ascent speed is important as there are neoprene flaps over the vents on the top of the bucket. If the bucket is hoisted too quickly these flaps could open, reducing the bucket's ability to reduce resuspension.

iii. Ascent speed is restricted to feet per second in the HDP by the States of New Jersey14 and New York15 as well in our Specifications16

iv. Descent speed is a factor in how far a clamshell bucket penetrates. As discussed above the best operation for the environment is to maximize penetration without overfilling the bucket. As penetration is controlled not just by speed but by other factors (including bucket weight, bucket footprint, material density and hardness) one speed will not be appropriate for all buckets and material. For this reason it is best not to put a speed limit on descent speed, rather it is best for the operator to operate the bucket with care and diligence in order to use the bucket to its greatest environmental advantage.

v. It has been suggested that the Corps should consider the Providence River O&M as a model of how to dredge. This contract does not have a descent speed limit, instead directing that:

> *The Contractor shall demonstrate that the dredge operator has sufficient control over bucket depth in the water and bucket closure so that sediment re-suspension from bucket contact with the bottom and due to bucket over-filling can be minimized.*[17]

vi. The use of a similar clause for the HDP can be considered.

f. Restrictions on hydraulic dredges

i. Cutterhead dredges in particular are at their cleanest when there is a large upland area to pump the slurry into and allow it to settle out. If such a facility were available they could be operated cleanly. The lack of such a facility, or a place to build one, is the reason they are currently not practicable.

ii. Hopper dredges, to operate efficiently, require the use of barge overflow. As barge overflow is not permitted in contaminated non-HARS material the use of hoppers dredges is currently not practicable.

iii. Several other types of hydraulic dredges (such as dustpans and horizontal augers) are capable of dredging fine-grained material while producing low turbidity in certain circumstances.18 These types of dredges can produce a great deal of sediment and water slurry and in Newark Bay there is no location to build a facility to pump the water into and allow the fines to settle out. For this reason, in coordination with the States of New York and New Jersey, hydraulic dredges are currently not practicable in the Newark Bay Study Area (NBSA).

g. Turbidity Monitoring/Performance Standard

[14] New Jersey Water Quality Certificate 0000-92-0031.9 page 3
[15] New York Water Quality Certificate 2-6499-00001/00002 page 5
[16] W912DS-05-B-0003 clause 02900-6.6.5, for example
[17] DACW33-03-0002 clause 02325-3.1.2.1
[18] Preliminary Design Report Hudson River PCBs Superfund Site, pgs 5-17 thru 5-18

i. Some superfund dredging uses a turbidity performance standard. Turbidity is measured full time. If the turbidity rises above a specified level dredging stops or other BMPs are employed until the turbidity level drops.

ii. It appears that the proposed performance standard for the General Electric Hudson River PCB cleanup is typical. It is based upon maintaining safe levels of turbidity at drinking water inlets.19

iii. As there is neither HTRW in our project limits, nor are there drinking water intakes in our project area (the water is too salty) a performance standard would serve no purpose, and the level chosen would be arbitrary.

iv. Further, as previously discussed in this document turbidity caused by passing ships is an order of magnitude greater than that caused by dredging.[20] Every time a ship passed (or something else caused a surge in turbidity), the project would be delayed even though the project didn't cause the impact. In 2004, there were 3,152 passages through Bergen Point of ships over 700ft long. There were also innumerable passages by smaller but still deep barges. The HDP would be severely impacted with no actual environmental benefit.

h. Silt Fence/Turbidity Curtains

Figure 5. Turbidity curtain.

i. Silt fences and turbidity fences are structures used to restrict the spread of turbidity.

ii. There are several design criteria to be considered when designing a silt fence[21]

1. Velocity and direction of current
2. Depth of water
3. Wind
4. Waves

[19] Hudson River PCBs Superfund Site Engineering Performance Standards Volume 2 pg. 47
[20] 2001 Total Suspended Sediment and Turbidity Monitoring in Newark Bay, Kill van Kull and Port Jersey, November 2002 pages 6-7

[21] http://www.parkersystemsinc.com/siltmaster_booklet.htm#DESIGN CRITERIA

iii. While silt fences can theoretically be designed for a current up to 3 knots, which is rarely exceeded locally, they must be kept at least 1 ft above the bottom at all times, including during tides, wakes and waves. Even then, due to the great depth of water in our channels designing a functional silt fence may not be possible. To quote a design guide for silt fences:

> *In tidal and/or wind and wave action situations, it is seldom practical to extend a turbidity curtain depth lower than 10 to 12 feet below the surface, even in deep water. Curtains which are installed deeper than this will be subject to very large loads, with consequent strain on curtain materials and the mooring system. In addition, a curtain installed in such a manner can "billow up" towards the surface under the pressure of the moving water, which will result in an effective depth significantly less than the skirt depth.*[22]

iv. Moving a silt fence is not an inconsequential action, due to its anchoring system and large sail area as well as considerations of accumulated silt. Since dredges move during their operation, both to follow the cut and to move out of the way of passing traffic the use of silt fences around a dredge is prohibitive. There are, however, situations where silt fences are a feasible BMP. There are wetlands and creeks that feed into the channels being dredged. These, depending upon the factors discussed above and in further detail in the cited sources, may be feasible sites for such control measures.

i. Cofferdams

Figure 5. Cofferdam at Olmstead Dam.

i. Cofferdams are temporary or permanent structures constructed with sheetpile, concrete, timber, or earth. They extend from the bottom above the high water line. These structures permit the interior to be completely dewatered.

ii. Cofferdams offer several advantages.

1. Work may proceed “in the dry”.
2. The area is isolated from the surrounding water.

j. Air Barriers

[22] Ibid.

i. Air barriers have been utilized in New York Harbor to reduce sedimentation in berthing areas.

ii. They function by producing bubbles that rise. The rising bubbles create mixing currents. Bubble curtains do not work by blocking silt.23

iii. As they do not block silt, their application is more suited toward reducing maintenance dredging then it is to blocking resuspension.

k. Blasting

i. Blasting is used to fracture rock in order to facilitate its removal.

ii. Significant research has been done on fish mortality, including blasting in the Kill van Kull (KVK).24 There have also been many studies on vibration of marine blasting, again including KVK and Arthur Kill (AK).25 Literature on the effects of blasting on resuspension of sediment is limited though.

iii. Measures taken to reduce resuspension and vibration include:

1. Contractors are required to remove overlaying silt before commencing rock work.[26]
2. Surface blasting is prohibited except when encountering large boulders that may not otherwise be removable.[27]
3. Contractors will stem (pack the top with non-explosive material) holes, helping to contain blast energy
4. Contractors will use delays between each hole, limiting the amount of explosive going off at any one time.
5. Contractors are required to measure and report vibrations, and to stay within legal vibratory limits.

l. Barge overflow

i. As dredge bucket will pick up water along with the dredge material. A hydraulic dredge will pump far more water than it does dredge material, but as discussed elsewhere their use is not allowed on the HDP by NYSDEC and NJDEP as a BMP.

ii. The scow that the dredge material will contain a mixture of solids and water. Historically contractors would continue filling the barge with dredge material, allowing the water in the scow to "overflow" the sides. This would reduce the number of trips the scow would make, thus reduces expense and air pollution. Water in a scow in rough seas (as may be encountered when going to the HARS) is more likely to shift than solids, and may cause the scow to be difficult or unsafe to tow.

iii. As "overflow" will allow some material to return to the waterway, albeit in the same area it was dredged from the use of overflow is somewhat restricted these days. Coarse material, for example, settles to the bottom of the scow rapidly leaving the overflow water relatively clean, and produce little turbidity. A fine grained unconsolidated material would not

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[23] Evaluation of a Berth Sedimentation Control Technology in Kill van Kull: The AirGuard Pneumatic Barrier System; Chapman, J; Douglas, S; page 3.
[24] Blast Monitoring Program for the Kill Van Kull Deepening Project; Ruben
[25] Stuctural Investigation/Blasting Analysis NYNJ Harbor 50' Channel Project; Master Harbor Partnership; July 2003.
[26] For example, W912DS-CIVIL-04-B-0003 02900-5.5.1
[27] For example, W912DS-CIVIL-04-B-0003 02200-2.8

settle as quickly and would produce more turbidity. Use of overflow for contaminated non-HARS material is prohibited.[28,29]

m. Adaptive Management

i. The Corps continually uses adaptive management practices as it moves through the construction of its contracts. This can be in the form of changes made to future contracts or modification to ongoing contracts. If future monitoring and/or testing indicate that changes need to be made to the execution of the HDP then the Corps would evaluate the data and in cooperation with USEPA and the States of New Jersey and New York determine the appropriate Best Management Practices to be used. Existing construction contracts will be modified using FAR 52.243-4 Changes clause. The Corps will issue a modification to the contract to incorporate the appropriate BMP as required. These changes will then be incorporated into future contracts as appropriate.

6. The following addresses those BMPs that ameliorate the amount of resuspension.

a. Environmental Windows

i. Windows do not actually reduce turbidity. An environmental window is a method to reduce environmental impacts by avoiding dredging during certain times of the year.

ii. Environmental windows commonly are established by negotiations between the US Army Corps of Engineers, National Marine Fisheries Service (NMFS), NJDEP, and NYSDEC.

iii. In the New York Harbor windows are often instituted to protect benthic organisms and their demersal eggs. Winter flounder is often selected as the species to be protected.

STEVEN WEINBERG
Team Leader, Engineering Division

[28] New Jersey Water Quality Certificate 0000-92-0031.9 page 3
[29] W912DS-05-B-0003 clause 02900-6.6.1, for example

TYPICAL WQC BMPS
NYSDEC

To protect winter flounder, dredging and blasting is limited as follows in the 'areas of concern' depicted in green on the attached Appendix 1 map. The areas selected were agreed to by all the involved regulatory agencies and in no way suggest that the New York State Department of Environmental Conservation has regulatory control over activities occurring outside its borders.

a. Dredging of silt is prohibited in the areas of concern between 01 February and 31 May.

b. Dredging and blasting of non-silt material is prohibited in the areas of concern between 01 March and 31 May.

To protect winter flounder, dredging and blasting is limited as follows in the 'areas of concern' depicted in green on the attached Appendix 1 map. The areas selected were agreed to by all the involved regulatory agencies and in no way suggest that the New York State Department of Environmental Conservation has regulatory control over activities occurring outside its borders.

a. Dredging of silt is prohibited in the areas of concern between 01 February and 31 May.

b. Dredging and blasting of non-silt material is prohibited in the areas of concern between 01 March and 31 May.

Sediment test results shall be submitted at least 30 days prior to the anticipated dredging start date of any project contract reach to verify the applicability of the restrictions stated in Special Condition #22.

An 'environmental bucket' is required for dredging silt and other fine-grained unconsolidated material. Drawings and performance specifications of the environmental bucket must be provided to the Department 15 days prior to the anticipated start date of dredging.

a. The following bucket specifications are required:

   i. The bucket shall be constructed with sealing gaskets or overlapping sealed design at the jaws, and seals or flaps positioned at locations of vent openings to minimize the loss of material during transport through the water column and into the barge.

   ii. Any seals or flaps designed and/or installed at the jaws and locations of vent openings must tightly cover these openings while the bucket is lifted through the water column and into the barge. If excessive loss of water and/or sediments from the bucket is observed from the time of its breaking the water surface to crossing the barge gunwale, the inspector shall halt dredging operations and inspect the bucket for defects. Operations shall be suspended until all necessary repairs or replacements are made.

An 'environmental bucket' is required for dredging silt and/or other fine-grained unconsolidated material.

1: Bucket hoist speed shall be limited to approximately 2 feet per second. The bucket shall be lifted in a continuous motion through the water column and into the barge.

2: The bucket shall be lowered to the level of the barge gunwales prior to the release of load.

3: There shall be no barge overflow when dredging silt and/or other fine-grained unconsolidated material.

Silt curtain(s) must be deployed across Bridge Creek to minimize resuspended sediments entering Bridge Creek. The silt curtains are to be placed 100 feet landward of the new top of slope of the channel, as depicted on the condition survey titled 'New York Harbor Arthur Kill Channel Navigation Improvement Project Contracts 1-5', sheet 3 of 6, dated 8 May 2003. Silt curtain(s) must be properly deployed and maintained whenever dredging operations are conducted within 1,500 feet of the mouth of Bridge Creek.

TYPICAL WQC BMPS
NJDEP

A sediment sampling plan for purposes of conducting bulk sediment chemistry analysis for each contract reach shall be submitted for DEC approval in coordination with the state of New Jersey at least 60 days prior to the anticipated dredging start date for a given reach.

Sediment test results shall be submitted at least 30 days prior to the anticipated dredging start date of any project contract reach to verify the applicability of the restrictions stated in Special Condition #22.

To protect winter flounder, dredging and blasting is limited as follows in the 'areas of concern' depicted in green on the attached Appendix 1 map.

a. Dredging of silt is prohibited in the areas of concern between 01 February and 31 May.

b. Dredging and blasting of non-silt material is prohibited in the areas of concern between 01 March and 31 May.

An 'environmental bucket' is required for dredging silt and/or other fine-grained unconsolidated material. Drawings and performance specifications of the environmental bucket must be provided to the Department 15 days prior to the anticipated start date of dredging.

a. The following bucket specifications are required:

    i. The bucket shall be constructed with sealing gaskets or overlapping sealed design at the jaws, and seals or flaps positioned at locations of vent openings to minimize the loss of material during transport through the water column and into the barge.

    ii. Any seals or flaps designed and/or installed at the jaws and locations of vent openings must tightly cover these openings while the bucket is lifted through the water column and into the barge. If excessive loss of water and/or sediments from the bucket is observed from the time of its breaking the water surface to crossing the barge gunwale, the inspector shall halt dredging operations and inspect the bucket for defects. Operations shall be suspended until all necessary repairs or replacements are made.

b. Bucket hoist speed shall be limited to approximately 2 feet per second. The bucket shall be lifted in a continuous motion through the water column and into the barge.

c. The bucket shall be lowered to the level of the barge gunwales prior to the release of load.

d. There shall be no barge overflow when dredging silt and/or other fine-grained unconsolidated material.

CENAN-PL-E 23 February 2005

MEMORANDUM FOR RECORD

SUBJECT: New Bedford Harbor PCB Cleanup and Providence River Maintenance Dredging

1. A Conference Call was held on 15 February 2005 with NAE and NAN to discuss dredging and monitoring methods for two NAE projects. The projects are the New Bedford Harbor, MA, Superfund Cleanup and the Providence River, RI, Maintenance Dredging.

2. The following individuals were present for the conference call:

Name	Organization	Phone Number
Ed O'Donnell	USACE CENAE	978 318 - 8375
Joseph MacKay	USACE CENAE	978 318 - 8142
Gary Morin	USACE CENAE	978 318 - 8232
Ronald Pinzon	USACE CENAN	917 790 - 8627
Ellen Simon	USACE CENAN	917 790 - 8158
Steve Weinberg	USACE CENAN	917 790 - 8391

3. NAN described a brief history of navigational dredging (Phases I, II and III of the Harbor Deepening Project) in NY & NJ Harbor and discussed the spatial relation with Corps dredging and the Diamond Alkali Superfund Site and study area.

4. NAE described the Superfund Cleanup Project in New Bedford Harbor, MA and the Providence River, RI Maintenance Dredging Project. Physical parameters, dredging methods best management practices (BMPs) and water quality monitoring conducted in both projects were discussed.

5. New Bedford is a HTRW remediation project, the majority of which is in a shallow area outside of navigation channels. NAE employed a horizontal auger dredge in the recent 2004 dredging season, which is best suited to shallow waters without traffic. They cannot dig in deep water, and their anchor cables present a hazard to navigation. Full-depth silt curtains were not used in 2004 because they were found to be impractical in past dredging activities at the site. The curtain would sit in the contaminated sediments at low tide, which would then be mobilized as the curtain expanded with the rise of the tide. Shorter (~ 2' depth) floating silt curtains combined with oil booms were used in 2004 to minimize the dispersion of floating oils and the minimal silt that was mobilized during dredging.

6. Providence was a maintenance-dredging project. About 4 million CY went to an open water site in Rhode Island Sound, and about 1 million CY went to a Confined Aquatic Disposal (CAD) cell located under the channel in the upper river. All maintenance material (predominantly silt and clay) was dredged using a closed bucket. Water Quality monitoring was conducted during disposal of unsuitable material into the CAD. No violations of WQ standards were observed. NYD's unsuitable material is being disposed of upland, so turbidity monitoring is not meaningful. Both NAE and NYD's dredging had/will occur respectively with a closed/environmental bucket.

7. It was determined there was no information that was new, the dredging issues discussed were all known prior to this coordination. Methods used to dredge the NYNJ Harbor are similar to methods used for the NAE dredging, where situations are similar. The major difference between the New Bedford Harbor dredging and the HDP is that some of the methods in the New Bedford site are only applicable in shallow areas (littoral zone areas and at times exposed mudflats) where a horizontal auger dredge is very effective in the range of up to 20 feet deep. The HDP dredging has depths greater than 50 feet deep. The NAN and NAE dredging projects are similar in that non-suitable ocean disposal material would be dredged in all cases using a closed/environmental bucket and that the suitable ocean disposal material could be dredged using an open bucket.

Ronald Pinzon

Biologist, Environmental Analysis Branch
Planning Division, USACE-NYD (917) 790 - 8627

CENAN-EN-M 11 January 2005

MEMORANDUM FOR Record

SUBJECT: Comparison of Hudson River PCBs Cleanup and NY Harbor 50

Comparisons have been made between the General Electric Hudson River PCB cleanup (HRPCB) and the New York Harbor 50ft deepening (NYH50) within the Newark Bay Study area. We have reviewed available documents on the HRPCB and have the following observations.

BACKGROUND

General Electric Hudson River Cleanup

The Hudson River PCBs Site occurs within a nearly 200-mile stretch of the Hudson River. For purposes of the HRPCB, EPA further divided the Upper Hudson River area into three main sections known as River Section 1, River Section 2, and River Section 3. From approximately 1947 to 1977, the General Electric Company (GE) discharged as much as 1.3 million pounds of polychlorinated biphenyls (PCBs) from its capacitor manufacturing plants at the Hudson Falls and Fort Edward facilities into the Hudson River.[1] This portion of the Hudson River has been declared a superfund site, and GE will be required to perform the "removal of all PCB-contaminated sediments within areas targeted for remediation, with an anticipated residual of approximately 1 mg/kg Tri+ PCBs"[2]. "Tri+ PCB" refers to all PCBs with three or more chlorine atoms. The primary purpose, therefore, of GE's dredging is the removal of PCB contaminated material. There is also a very limited navigational dredging component, in connection with allowing dredging access and maintaining safe navigation of vessels during construction.[3] Resuspension of material is an issue due to the need to "keep the water column concentrations (of PCBs) close to current baseline levels"[4]. This will reduce uptake by fish into their tissue[5] and maintain drinking water standards at water intakes[6]. Water depths for the HRPCB are typically less than 20ft and typical dredging face is 2-3ft.[7] Depending upon reach and year the HRPCB is expected to remove 265,000-530,000 cy per year.

As of December 2004 the latest progress of the HRPCB was to select dewater/sediment transfer sites.[8] Remedial dredging has not yet begun.

1 http://www.epa.gov/hudson/background.htm
2 Hudson River PCBs Site New York Record of Decision, pg iii
3 Preliminary Design Report Hudson River PCBs Superfund Site, pg 4-10
4 Hudson River PCBs Superfund Site Engineering Performance Standards Volume 2 pg. 46
5 Ibid
6 Ibid pg 47
7 Preliminary Design Report Hudson River PCBs Superfund Site, pg 5-4
8 http://www.epa.gov/region02/news/2004/04182.htm

New York Harbor Navigation Project

The NYH50 project has as its primary goal to improve the channels leading to various container ports in New York Harbor to accommodate the current generation of container vessels. Design depth in the Newark Bay area is 52ft mean low water (mlw) plus 1.5ft of paid overdepth. Typical dredging face is 5-10ft, but can be greater or less in specific locations. The NYH50 is the latest in a series of dredging construction and maintenance projects that have been executed in this area. Other projects include Kill Van Kull and Newark Bay Phase I which completed in 1991, Kill Van Kull and Newark Bay Phase II which was initiated in March 1999 and completed in December 2004 and Arthur Kill 41 which is currently ongoing. The NYH50 started as a permit action by the Port Authority of New York and New Jersey (PANYNJ) in early 2002 with Area 5. In none of these prior projects, or in the currently tested portions of NYH50, have the sediments to be dredged ever been identified as characteristic of HTRW material. Turbidity control is a concern relative to water quality issues, not HTRW and as such is regulated under the Clean Water Act and not CERCLA.

COMPARISON OF PROJECTS

It is clear based upon the information reviewed in General Electric's PRELIMINARY DESIGN REPORTS HUDSON RIVER PCBs SUPERFUND SITE APRIL 2004 that there are major differences between the HRPCB and NYH50. First, the area to be dredged as part of the NYH50 project is not in a superfund site. The second major difference is that the majority of the NYH50's footprint in the expanded EPA study area has been recently dredged to an interim depth of 47ft in the Federal navigation channels in the southern half of Newark Bay and 43ft in the Federal navigation channels leading from the Kill van Kull leading into the Arthur Kill between 1999 and 2004. Turbidity control is a major concern for the HRPCB as the PCBs in the resuspended sediment could be uptaken by fish tissues or end up in drinking water intakes. In the NYH50 resuspension is a concern primarily due to its physical effects as it may bury benthic organisms. The NYH50 in the Newark Bay area will be dredged to 52ft plus 1.5ft of paid overdepth.

HUDSON RIVER PCBs CLEANUP, DREDGING DESIGN

General Electric has considered several dredging technologies for the HRPCB. In summary the dredging technologies considered and some of their strengths and weaknesses (according to the report) were:[9]

a. Conventional "open" clamshell
   Would create relatively large amounts of turbidity, but handled rock and debris better than other dredges.[10]

b. Environmental "closed" clamshell
   May reduce turbidity. Level cut reduces overdredging. Long cycle time reduces production. Can only be used in very soft material. GE declares that "This dredge

[9] Preliminary Design Report Hudson River PCBs Superfund Site, pgs 5-10 thru 5-21
[10] Ibid pg 5-11

type is primarily suitable for areas of the Upper Hudson River with fine-grained sediment."[11]

c. Articulated mechanical dredge (backhoes)
Similar advantages to the environmental clamshell, but with increased digging ability. Disadvantages are also somewhat similar to environmental clamshells. However, these dredges are also scarce. There isn't much documentation to their effectiveness as compared to an environmental clamshell. These too were found to be suitable for the Upper Hudson River.[12]

d. Amphibious dredges
It was found that the "primary application of this dredge is for shoreline areas where there may be a variety of wetlands, mud flats, or very shallow areas with standing water." Other than that other types of dredges performed better.[13]

e. Excavation in the dry
While an effective way of isolating turbidity, there were still issues with dewatering material. The report also found that:

> *The isolation of the portion of the river's cross-section targeted for excavation could impact navigational and recreational river traffic, and cause localized increases in surface water velocities that may increase erosion potential for adjacent river banks and structures. This may serve to undermine the existing structures or cause flooding under elevated flow conditions. Given these concerns, application of this sediment removal technique is limited to select portions of the Upper Hudson River that lend themselves to hydraulic isolation (e.g., shallow backwater areas and shallow near shore areas).*[14]

f. Hydraulic dredges
These were further divided by the type of dredge.

- Plain suction
  This type of dredge is very accurate and clean, but since they're small and diver operated production is poor and safety is an issue. There is also the issue of disposing of large amount of water generated by the dredge. The report stated that:

  > *The potential use of plain suction dredges for the Upper Hudson River is expected to be limited to diver-assisted re-dredging operations. Plain suction dredging would only be implemented if the primary dredge method is unsuccessful in achieving the USEPA's draft residuals standard.*[15]

- Cutterhead dredges

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[11] Ibid 5 pgs 5-11 thru 5-13
[12] Ibid 5-14
[13] Ibid
[14] Ibid 5-15
[15] Ibid 5-16 thru 5-17

Cutterheads are widely available, and can be effective at this type of dredging. Resuspension is still an issue, however. Cutterheads also produce tremendous amounts of water, which require appropriate management, and are vulnerable to clogging from debris. The report found that "the cutterhead dredge is expected to be suitable to the Upper Hudson River with the possible exception of areas with shallow bedrock."[16]

- Horizontal auger dredge
  In many ways similar to the cutterhead dredge. It is however more likely to resuspend sediment than a cutterhead, restricted to shallow water, and is operated on a network of cables that interfere with the navigation of other vessels. The report found that "The horizontal auger dredge is potentially suitable for the non-navigational portions of the river."
- Pneumatic Dredges/High Solids Pumps
  A relatively new technology, these dredges are scarce and without much of a track record. They are asserted to be relatively clean. They apparently also produce quite a bit of water, although less than other hydraulic dredges. Debris remains an issue. The report finds that:

  > *The dredges appear to have some applicability to the Upper Hudson River, yet the limitations (including the general lack of quantitative eperformance data for residuals and resuspension) could limit their use.*[17]

COMPARISON OF DREDGING DESIGN

Comparing the conclusions of the General Electric report, which is for a Superfund site with our non-Superfund project provided an interesting result.

Based on the above, hydraulic dredges seem to be a poor fit to our project. When used in fine sediments a large settling/containment area would be required to settle the slurry from the dredge. Several past studies by the Corps have shown that no feasible area is available. Debris is frequently encountered in our dredging projects. Add to this the local regulatory agency's concerns about hydraulic dredges in Newark Bay, Arthur Kill and Kill van Kull and it appears to be an unsuitable technology. Due to these concerns, use of hydraulic dredging in this area has been prohibited in the Corps' contracts for the ongoing deepening contracts. Two of the hydraulic dredges have additional problems. The plain suction dredge would require divers to operate in relatively deep water in the proximity of traffic for weeks at a time. From a safety perspective alone, this is likely unacceptable. The horizontal auger dredge's cables present a hazard to navigation.

Amphibious dredges are limited to shallow water, something there is very little of in our navigational channel construction project.

Once you eliminate the hydraulics and amphibious dredges, conventional clamshells, environmental clamshells, and backhoes remain. The Corps of Engineers did a dredgability

[16] Ibid 5-17 thru 5-18
[17] Ibid 5-19 thru 5-21

analysis for the NYH 50 project[18],[19]. The same types of dredges that were recommended for dredging the navigable areas of the HRPCB project were recommended for the NYH50 project, and are currently being used. Based on the information reviewed it appears that the dredges identified to be used to remove the hard material in the HRPCB are similar to those currently being used for the NYH50. Also, the use of an environmental clamshell for NYH50 to dredge soft Holocene silt appears to be consistent with the findings of the Corps of Engineers reports.

RESUSPENSION CONTROL TECHNOLOGIES

General Electric's report also discussed various sediment control technologies for the HRPCB. In summary the dredging technologies considered and some of their strengths and weaknesses were:

a. Silt curtains
   Silt curtains were found to be an effective solution in water depths less than 20ft and currents less than 1.5 fps. It did note that using silt curtains in navigable areas presented a small risk to vessels. Silt curtains were more effective at reducing surface control than bottom control as curtains have to remain 1-2ft above the bottom. [20]
b. Sheetpile walls
   Found to be extremely effective, installation and removal was slow and expensive. Installation of sheetpile into rock or through rip-rap is impracticable. Also, as the walls cannot be moved they cannot be used in navigable areas. [21]
c. Other resuspension control processes
   - King piles
     Similar to a sheetpile system, these are a series of H piles driven into the bottom with walls installed between them. Better suited to hard bottoms than sheetpile. Like sheetpile they're a hazard to navigation. [22]
   - Air curtains
     Large infrastructure system required, and there is little evidence supporting to efficacy. [23]
   - Cassions
     A tube is lowered to the bottom, and the material is removed through the tube. A highly effective system, it is limited by a small footprint. The report concludes that "For the Hudson River project, this resuspension control system may be considered for small areas of relatively highly contaminated sediment."[24]
   - Portable dams
     Inflatable structures that once installed have the water pumped out of them allowing work to proceed in the dry. Their flexible nature makes them well suited to

[18] Feasibility Study NY and NJ Harbor Navigation Study December 1999 pages F11-F25
[19] Limited Reevaluation Report and Environmental Assessment on Consolidated Implementation of the New York and New Jersey Harbor Deepening Project January 2004, pages F8-F15
[20] Preliminary Design Report Hudson River PCBs Superfund Site 6-8 thru 6-10
[21] Ibid 6-10 thru 6-12
[22] Ibid 6-12 thru 6-13
[23] Ibid 6-13
[24] Ibid 6-13 thru 6-14

undulating bottoms. However, the dams can only be utilized in shallow water. They are vulnerable to punctures. They do not readily allow the passage of vessels.

d. No containment
Has been utilized at a variety of sites. Report states "will be considered as first engineering contingency for all dredge areas and scenarios."[25]

The Corps of Engineers also evaluated sediment control technologies and came to similar conclusions[26]. Generally the results of our findings are similar to those in General Electric's plan for the navigable portions of their project.

Comparing the conclusions of the General Electric report, which is for a Superfund site with our non-Superfund project is interesting.

The various containment technologies all have at least one of the following problems. They are either unsuited to deep water or are a hazard to navigation. As such none of the technologies could be used in the navigable waters. The Corps has committed to the use of silt curtains to protect specific shallow water habitats with low current velocities from resuspension. These protections are to protect dermersal eggs from burial and not due to Superfund concerns as all past and all planned future dredge material from continued construction of the NYH50 is far less contaminated than what is characteristic of HTRW material as has been defined by the appropriate regulatory agencies.

STEVEN WEINBERG
Team Leader, Engineering Division

[25] Ibid 6-23
[26] Approaches on Minimizing Re-suspension of Sediment in Dredging 20 January 2005

Appendix C

HTRW Guidance

CENAN-PP-H 29 December 2005

MEMORANDUM FOR RECORD

SUBJECT: Application of HTRW Regulation to Corps navigation deepening dredging in Newark Bay Study Area

1. References:

a. CECW-PO Engineer Regulation 1165-2-132 (ER 1165-2-132) entitled Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects dated 26 June 1992. See enclosure A for excerpted text.

b. EPA guidance on Hazardous Waste Exemptions for Dredge Material. As Per Dredged Material Exclusion (Sec. 261.4(g)) Hazardous Waste Determination: As Per Dredged Material Exclusion (Sec. 261.4(g)) Hazardous Waste Determination:[Federal Register: November 30, 1998 (Volume 63, Number 229)][Rules and Regulations] From the Federal Register Online via GPO Access [wais.access.gpo.gov]. See enclosure B for excerpted text.

2. In February 2004, the USEPA, Region 2 entered an Administrative Order Consent (AOC) to perform a CERCLA Remedial Investigation/Feasibility Study (RI/FS) of the Newark Bay study area as the third operable unit under the NPL listed Diamond Alkali Superfund Site. This Memorandum for Record (MFR) generally describes the effect that this designation has or may have in the future upon ongoing and future Corps' civil works navigation deepening dredging in the NBSA, particularly as it relates to reference 1.a.

3. Presently, the US Army Corps of Engineers, New York District (NYD), with the sponsorship of the Port Authority of New York and New Jersey (PANY/NJ), is in the process of constructing deeper federal navigation channels which lie within much of the southern half of the NBSA (as presently defined). Also, the NYD is periodically performing maintenance dredging, primarily with sponsorship of the PANY/NJ also, on previously constructed navigation channels within the southern half of the NBSA. The NYD also regulates dredging and other activities (*e.g.*, berth dredging, pier construction/ rehabilitation, etc.) in the NBSA but the federal maintenance and regulatory actions are not evaluated as part of this MFR.

4. General background:

a. Sediments and associated debris dredged for navigational purposes define the term "dredged material". As per Reference 1.a., regardless of dredged material contamination levels or the potential effects posed by the contaminants, dredged material from Corps' civil works navigation projects (either "new work" construction (also known as deepening work) or maintenance dredging) is regulated under either the CWA and/or the MPRSA as coordinated and approved by the USEPA and/or the involved State(s) in which the dredging and placement of the dredged material occurs. The policy for continuing the application of the CWA and/or MPRSA regulatory evaluation process (*e.g.*, following the 404(b)(1) guidelines of the CWA) to material that may exceed established HTRW criteria ostensibly derives from the urgency to facilitate adequate navigation that is necessary and timely to meet the nation's security needs (economic and potentially military in certain locations and occasions).

b. For an authorized Corps' civil works navigation project, the evaluation and decision to dredge the project, regardless of whether the material exceeds an established HTRW criterion, involves meeting three conditions:

i. The first condition is determining the most cost-effective, environmentally acceptable method to dredge the project and manage the material from it in coordination with the involved federal and state(s) regulatory agency(ies). This involves the thorough technical evaluation of the material proposed to be dredged and the selection of feasible dredging methods and best management practices (BMPs) to employ when dredging the project, if and when the decision is made to dredge the project. Should any part of the material proposed to be dredged exceed an established HTRW criterion, then the dredging methods and BMPs that are required to be employed by the EPA and/or the State(s) (or the Corps in its own determination beyond those required of the EPA and/or the State(s)) could be modified, akin to that which may be planned or in use by EPA and/or the State(s) during remedial/environmental dredging of similar sediments in areas near or adjacent to the navigation project.

ii. The second condition involves evaluating the costs and benefits of the project, as designed in condition 4.b.i. above, to ensure that it meets federal requirement for national economic development. This involves comparing the costs of the proposed dredging project compared to the benefits derived or anticipated as a result of the dredging. Several economic regulations and guidelines are used within the Corps for both navigation channel construction and maintenance to ensure that the project provides a net overall economic benefit to the nation.

iii. The third condition involves sponsorship and cost-sharing. Subsequent to the Water Resources Development Act of 1986, all Corps' civil works navigation projects require some degree of non-federal sponsorship. This sponsorship may be as simple as providing necessary lands, easements, rights-of-way, and/or relocations necessary to perform the project to cost-sharing some portion of the costs of the general navigation features of the project itself (*i.e.*, the federal channel). If some of the material to be dredged from the project exceeds established HTRW criterion, then the cost-sharing requirements for the non-federal sponsor may also change in response to how that material may be dredged and managed. Reference 1.a. explains this further. Should the first two conditions be met, this condition is met dependent upon the non-federal project sponsor support for the project and upon sufficient federal (and possibly also non-federal) funding to accomplish the project.

c. Only after all the aforementioned general conditions are met, is the decision made to construct a Corps civil works navigation project. This approach has been and will continue to be applied during the remaining construction of the NY/NJ Harbor Deepening project and the Arthur Kill 40/41 ft. navigation project (as it would be with any other Corps civil works navigation project anywhere in the country).

5. Application of HTRW criterion to dredged material in the NBSA (see enclosures A and B for additional Corps and EPA guidance, respectively):

a. Currently, the NJDEP and the NYSDEC have adopted from the EPA, lists of criteria for selected contaminants to determine if the material is or is not characterized as being a hazardous substance (see enclosures C and D, respectively). The criteria are based upon performing a contaminant extraction test known as Toxic Characteristic Leaching Procedures (TCLP), which is the only procedure approved for hazardous waste characterization under the federal Resource Conservation and Recovery Act (RCRA). In the test, the solid phase of the test material is agitated for approximately 18 hours with an amount of fluid (a buffered solution of sodium hydroxide and acetic acid) equal to 20 times the weight of the solid phase. Based on this, both states also accept the use of bulk sediment chemistry values divided by 20 as a surrogate for the TCLP leachate criteria, since the bulk sediment chemistry concentration could not exceed the established TCLP criteria values were all the contaminant in the test material be leached into the solution.

b. While this criteria is used to determine if material is characteristic of being a hazardous substance, it does not necessarily apply or equate to criteria that may be established for a placement site for dredged material. Also noteworthy, for sediments in Newark Bay, neither the NJDEP nor EPA have yet established criteria for dioxin contamination in sediments. (NJDEP issued a directive on 14 December 2005 to a limited number of potentially responsible parties for designing the dredging and removal of sediments in the lower six miles of the Passaic River for sediments contaminated with 2,3,7,8 TCDD above the level of 17 parts per trillion). In New Jersey and based upon the cleanup criteria that were established for the upland Diamond Alkali sites along the Passaic River, an upland placement criteria for processed dredged material exists for material that is above 1 part per billion for dioxin. In the past eight years, a few specific private dredging interests in northern Newark Bay were not allowed to place dredged material upland due to this placement criterion. In those circumstances, the permit applicant's material was allowed to be dredged and placed within the Newark Bay Confined Disposal Facility (NBCDF), which is an open-water disposal pit permitted, constructed and operated by the Port Authority of New York and New Jersey in 1997 for the disposal of dredged material. The NBCDF remains an operating open-water disposal pit as of the preparation of this MFR.

c. In terms of NPL listing, the NPL Site Narrative for Diamond Alkali Co. listing (September 1983): The Diamond Alkali Co. Site occupies about 1 acre immediately adjacent to the Passaic River, in Newark, Essex County, New Jersey. The NPL listing has not been updated to include NBSA. As Per EPA's definition of NPL: the NPL does not describe releases in precise geographical terms; it would be neither feasible nor consistent with the limited purpose of the NPL (to identify releases that are priorities for further evaluation), for it to do so.

d. For Newark Bay sediments and as part of the AOC, the USEPA Region 2 is now in the initial stages of the Remedial Investigation/Feasibility Study (RI/FS). EPA describes the RI/FS as follows:

The remedial investigation serves as the mechanism for collecting data to characterize site conditions; determine the nature of the waste; assess risk to human health and the environment; and conduct treatability testing to evaluate the potential performance and cost of the treatment technologies that are being considered. The FS is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. The RI and FS are conducted concurrently — data collected in the RI influence the development of remedial alternatives in the FS, which in turn affect the data needs and scope of treatability studies and additional field investigations. This phased approach encourages the continual scoping of the site characterization effort, which minimizes the collection of unnecessary data and maximizes data quality.

e. The risk assessments performed during the RI result in the criteria for determining if material in the study area (or site) is characteristic of HTRW. This criterion is then applied to an array of potential remedial alternatives to determine the best response action to apply to those areas of the study area that exceed the established criteria. The result of the RI/FS is typically a Record of Decision, which describes the technical evaluations performed, the alternative considered, the public's comments and responses, and designates the preferred response action(s) in the specific geographic locations decided upon by the managing regulatory agency (*e.g.*, the EPA). In other words, in the CERCLA process, it's the ROD that designates the specific boundary, the action level and the response action to be applied within the boundary (the three conditions described in paragraph 4.a.(2) of reference 1.a., excerpted in enclosure A).

f. Deepening projects by their very purpose dig deeper into a channel and oftentimes require dredging into sediment layers, or strata, that are preindustrial and oftentimes prehistoric in age. Since the physical and chemical characteristics of each sediment strata may vary widely from one to another, different dredging methods are required to remove the sediments as well as different placement sites are targeted for the materials to best match the materials' physical and chemical characteristics based upon environmental acceptability and cost considerations. Whenever feasible, material dredged from the Port of New York and New Jersey is used beneficially in both the aquatic and upland environments.

g. Placement of Dredged Material: Depending upon the placement site(s) targeted for the various sediment strata, different sampling and testing methods are employed by the involved regulatory agency to determine the suitability of the material for placement at the targeted site. The testing criteria are developed to characterize the potential environmental effects of most concern that the material may have if placed in those environments, therefore the testing criteria for any placement site may not be comparable <u>at all</u> to testing criteria established for other placement sites.

i. For placement sites in ocean waters, the criterion established by the EPA under the MPRSA is used to determine a material's suitability. In the Port of New York and New Jersey, this translates into the criteria used for determining suitability for placing dredged material at the Historic Area Remediation Site (HARS). Of note, the testing protocols used to determine suitability for placing dredged material at the HARS are one of, if not, the most stringent and protective ocean disposal testing protocols established in the nation.

ii. For placing rock material at artificial reef sites, the designation and management of these sites are under the control of either the NYSDEC or NJDEP, depending upon which state's coastal waters these sites lie within (or are adjacent to). Since some artificial fish reef sites fall outside the coastal water, three-mile boundary, the EPA also oversees these sites designation and management.

iii. For upland sites and the NBCDF, the state in which the site resides establishes placement criteria for the site. For both New York and New Jersey, the upland placement criteria is based upon both bulk sediment chemistry data for material which has been processed with admixtures such as Portland cement or coal fly ash (as needed to achieve acceptable physical properties for use on land) and upon multiple batch leachate testing (which is similar to TCLP, except multiple extractions are performed). Typically, one or both states provide a sampling plan for material targeted for upland placement. The samples are collected, composited (as described in the sampling plan), and tested according to their established testing procedures. Once a specific upland placement site is proposed, the dredged material test results are then compared to the site-specific criteria of that site to determine if the material, in part or whole, is acceptable for placement at the site.

h. In the NBSA, the surficial silty material is of greatest concern in both the dredging methods used and the placement sites selected for the material due to its likelihood for contamination as a result of post-industrial age pollution. Since this material could potentially be determined to be characteristic of HTRW if and when a ROD designating a location(s) in the NBSA for a response action(s), the Corps, in consultation with and oftentimes by the direction of the two State regulatory agencies and the EPA, employs several special dredging methods and best management practices to reduce any adverse environmental impact from the dredging of this surficial silty material. In other words, to the extent that is practicable given the navigation purposes of the project, the surficial silty material from the harbor deepening projects are dredged in a manner that is comparable to the manner in which it would be dredged if it were found to be characteristic of HTRW material and part of a CERCLA designated response action. Further, if in the future, should the RI/FS result in criterion such that some Corps civil works navigation project material exceeds the criterion and/or falls within a designated boundary for the response action, then the environmental protection conditions put in place may become more stringent, the costs related to dredging and managing the material may change/increase, and the cost-sharing of the dredging may change, but the CWA and/or MPRSA regulatory process for evaluating and possibly dredging the material remains unchanged.

i. Once the appropriate regulatory agencies have reviewed and accepted the various respective test results from a particular deepening project contract, the States regulatory agencies issue a contract specific Water Quality Certificate under Section 401 of the Clean Water Act. Based on the review of all data provided to the two states with the WQC application, the two state agencies decide whether to issue a WQC and if needed, will add requirements, in the form of best management practices or other procedures, to reduce or minimize impacts to the aquatic habitat. Should the contract also include material that the EPA and Corps have found to be suitable for placement at the HARS and depending upon the outcome of the public review and an analysis of practicable alternatives, then the HARS suitable material may be placed at the HARS.

BRYCE WISEMILLER
Project Manager

ENCLOSURE A

DEPARTMENT OF THE ARMY ER 1165-2-132
Regulation No. 1165-2-132 26 June 1992

Water Resource Policies and Authorities
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW) GUIDANCE
FOR CIVIL WORKS PROJECTS

1. Purpose. The purpose of this document is to provide guidance for consideration of issues and problems associated with hazardous, toxic, and radioactive wastes (HTRW), which may be located within project boundaries or may affect or be affected by Corps Civil Works projects. The guidance is intended to provide information on how these considerations are to be factored into project planning and implementation.

2. Applicability. This regulation applies to HQUSACE/OCE elements, major subordinate commands, districts, laboratories, and field operating activities (FOA) having Civil Works responsibilities.

3. References. See Appendix A.

4. Definitions.
a. Hazardous, toxic and radioactive wastes (HTRW).
(1) Except for dredged material and sediments beneath navigable waters proposed for dredging, for purposes of this guidance, HTRW includes any material listed as a "hazardous substance" under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et seq (CERCLA). (See 42 U.S.C. 9601(14).) Hazardous substances regulated under CERCLA include "hazardous wastes" under Sec. 3001 of the Resource Conservation and Recovery Act, 42 U.S.C. 6921 et seq; "hazardous substances" identified under Section 311 of the Clean Air Act, 33 U.S.C. 1321, "toxic pollutants" designated under Section 307 of the Clean Water Act, 33 U.S.C. 1317, "hazardous air pollutants" designated under Section 112 of the Clean Air Act, 42 U.S.C. 7412; and "imminently hazardous chemical substances or mixtures" on which EPA has taken action under Section 7 of the Toxic Substance Control Act, 15 U.S.C. 2606; these do not include petroleum or natural gas unless already included in the above categories. (See 42 U.S.C. 9601(14).)

(2) Dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal action or a remedial action) under CERCLA, or if they are a part of a National Priority List (NPL) site under CERCLA. Dredged material and sediments beneath the navigable waters proposed for dredging shall be tested and evaluated for their suitability for disposal in accordance with the appropriate guidelines and criteria adopted pursuant to Section 404 of the Clean Water Act and/or Section 103 of the Marine Protection Research and Sanctuaries Act (MPRSA) and supplemented by the Corps of Engineers Management Strategy for Disposal of Dredged Material: Containment Testing and Controls (or its appropriate updated version) as cited in Title 33 Code of Federal Regulations, Section 336.1

<u>ENCLOSURE B</u>

EPA guidance on Hazardous Waste Exemptions for Dredge Material.
As Per Dredged Material Exclusion (Sec. 261.4(g) Hazardous Waste Determination

> The exclusion also applies in the case of a Corps civil works project that receives the administrative equivalent of a CWA or MPRSA permit, as provided for in Corps regulations. This regulatory language refers to the fact that the Corps does not process and issue permits for its own activities, but authorizes its own discharges of dredged or fill material by applying the same applicable substantive legal requirements, including public notice, opportunity for public hearing, and application of the section 404(b)(1) guidelines or MPRSA criteria. EPA has the authority to develop environmental guidelines and the authority to prohibit or conduct further review of a proposed discharge by the Corps, in the same manner as it can with a private permit applicant. Thus, the exclusion in today's rule includes CWA and MPRSA permits, as well as their administrative equivalents in the case of Corps civil works projects.
>
> For dredged material covered by a CWA or MPRSA permit, the combination of statute, Federal regulations, and Regional guidance, along with the testing and management protocols that have been developed jointly by EPA and the Corps, will be adequate to address potential contaminant-related impacts in both ocean and inland waters. Examples of the existing testing and management protocols include: *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.--Testing Manual (EPA-823-B-98-004)* and *Evaluation of Dredged Material Proposed for Ocean Dumping--Testing Manual (EPA-503-B-91-001)*, which contain current procedures on implementing the dredged material testing requirements under the CWA and MPRSA respectively. The manuals contain tiered evaluation systems that include, as appropriate: physical analysis of sediment; chemical analysis of sediment, water, and tissue; bioassay tests; and bioaccumulation tests of contaminant impacts. EPA believes that CWA and MPRSA permits coupled with these testing manuals and relevant Regional guidance will ensure the protective management and discharge of dredged material.

ENCLOSURE C

New Jersey Department of Environmental Protection
Hazardous Waste Technical Assistance Unit (609) 292-8341

Hazardous Waste Levels

Below are the analytical parameters and their regulatory levels for waste classification purposes. The different testing parameters do not apply to all waste types. Parameters represented by EPA waste numbers D004 through D043 are determined by TCLP methods. Please contact our unit at the above telephone number for hazardous waste classification information.

EPA Waste Number	Parameters/Contaminant	Hazardous Level
D001	Ignitibility	≤140° F
D002	Corrosivity	≤2 and ≥12.5 pH
D003	Reactive Sulfide	500 mg/kg
D003	Reactive Cyanide	250 mg/kg
D004	Arsenic	5.0 mg/l
D005	Barium	100.0 mg/l
D006	Cadmium	1.0 mg/l
D007	Chromium	5.0 mg/l
D008	Lead	5.0 mg/l
D009	Mercury	0.2 mg/l
D010	Selenium	1.0 mg/l
D011	Silver	5.0 mg/l
D012	Endrin	0.02 mg/l
D013	Lindane	0.4 mg/l
D014	Methoxychlor	10.0 mg/l
D015	Toxaphene	0.5 mg/l
D016	2,4-D	10.0 mg/l
D017	2,4,5-TP Silvex	1.0 mg/l
D018	Benzene	0.5 mg/l
D019	Carbon tetrachloride	0.5 mg/l
D020	Chlordane	0.03 mg/l
D021	Chlorobenzene	100.0 mg/l
D022	Chloroform	6.0 mg/l
D023	o-Cresol	200.0 mg/l
D024	m-Cresol	200.0 mg/l
D025	p-Cresol	200.0 mg/l
D026	Cresol	200.0 mg/l
D027	1,4-Dichlorobenzene	7.5 mg/l
D028	1,2-Dichloroethane	0.5 mg/l
D029	1,1-Dichloroethylene	0.7 mg/l
D030	2,4-Dinitrotoluene	0.13 mg/l
D031	Heptachlor	0.008 mg/l
D032	Hexachlorobenzene	0.13 mg/l
D033	Hexachlorobutadiene	0.5 mg/l
D034	Hexachloroethane	3.0 mg/l
D035	Methyl ethyl ketone	200.0 mg/l
D036	Nitrobenzene	2.0 mg/l
D037	Pentachlorophenol	100.0 mg/l
D038	Pyridine	5.0 mg/l
D039	Tetrachloroethylene	0.7 mg/l
D040	Trichloroethylene	0.5 mg/l
D041	2,4,5-Trichlorophenol	400.0 mg/l
D042	2,4,6-Trichlorophenol	2.0 mg/l
D043	Vinyl chloride	0.2 mg/l

3/12/98

ENCLOSURE D

NYSDEC HTRW Criteria

HAZARDOUS WASTE REGULATORY LEVELS FOR TOXICITY CHARACTERISTIC

CONSTITUENT	REGULATORY LEVEL (mg/L)
Arsenic	5.0
Barium	100.0
Benzene	0.5*
Cadmium	1.0
Carbon tetrachloride	0.5*
Chlordane	0.03*
Chlorobenzene	100.0*
Chloroform	6.0*
Chromium	5.0
o-Cresol	200.0*
m-Cresol	200.0*
Cresol (TOTAL)	200.0*
2,4-D	10.0
1,4-Dichlorobenzene	7.5*
1,2-Dichloroethane	0.5*
1,1-Dichloroethylene	0.7*
2,4-Dinitrotoluene	0.13*
Endrin	0.02
Heptachlor (and its epoxide)	0.008*
Hexachlorobenzene	0.13*
Hexachloro-1,3butadiene	0.5*
Hexachloroethane	3.0*
Lead	5.0
Lindane	0.4

HAZARDOUS WASTE REGULATORY LEVELS
FOR TOXICITY CHARACTERISTIC (Cont'd)

CONSTITUENT	REGULATORY LEVEL (mg/L)
Mercury	0.2
Methoxychlor	10.0
Methyl ethyl ketone	200.0*
Nitrobenzene	2.0*
Pentachlorophenol	100.0*
Pyridine	5.0*
Selenium	1.0
Silver	5.0
Tetrachloroethylene	0.7*
Toxaphene	0.5
Trichloroethylene	0.5*
2,4,5-Trichlorophenol	400.0*
2,4,6-Trichlorophenol	2.0*
2,4,5-TP (Silvex)	1.0
Vinyl chloride	0.2*

* New Toxicity Characteristics Effective 9/25/90

I

Appendix D

Inspections

Appendix D

Inspections

D1 – MRF Contract Enforcement of Environmental Requirements - Metro Area Office

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
KILL VAN KULL FIELD OFFICE
CAVEN POINT MARINE TERMINAL, 3 CHAPEL AVENUE, PORT LIBERTE'
JERSEY CITY, NEW JERSEY 07305

REPLY TO
ATTENTION OF

CENAN-CO-M 8 November 2005

MEMORANDUM FOR RECORD

Subject: Contract Enforcement of Environmental Requirements - Metro Area Office

1. The Metro Area Office (CENAN-CO-M) insures compliance with all contract environmental requirements through execution of a comprehensive Quality Assurance (QA) program and enforcement of all contract requirements for Contractor Quality Control (CQC). The Contracting Officers Representative (COR) has direct and indirect authority to assure that the work is being preformed in compliance with the plans and specifications, as stated in the example solicitation DACW51-03-B-0001, in the basic section 800 page 8-9.

2. Prior to initiation of any contract work, comprehensive contractor plans for CQC, Accident Prevention, and Environmental Protection must be submitted and approved by this office. Details of methods & procedures for compliance with all regulatory and environmental requirements, as well as an appropriate corporate organizational structure must be provided prior to start of work. The contractor must establish and maintain an effective quality control system in compliance with the contract clause entitled "Inspection of Construction", as stated in the example solicitation DACW51-03-B-0001, in the basic section 1451 pages 1 thru 5.

3. The three phase QA/CQC inspection process requires that contractors conduct a preparatory inspection (in the presence of Government QA representatives) prior to initiation of each definable feature of work. This process insures understanding of all requirements by the appropriate and responsible contractor personnel and demonstrates the contractor's ability and readiness to execute said requirements. Initial and follow-up inspections are conducted by CQC and QA personnel on a daily basis as each feature of work progresses. These controls are explained in the example solicitation DACW51-03-B-0001, Sect 01451, pgs 5 thru 8.

4. Typically, our new work dredging contracts include but are not limited to environmental requirements to address the following:

Water**:**

- Compliance with the State(s) Water Quality Certificate (WQC) is a standard contract requirement to ensure compliance with the Clean Water Act, as stated in the example solicitation DACW51-03-B-0001, in the basic section 903 page 12 & 14. The contractor must hire New York District certified inspectors of open water disposal of dredge material, known as Certified Disposal Inspectors (CDIs). The CDIs will observe sediment removal and loading of scows at the dredging sites and monitor transport of dredge material to the HARS, as well as to processing facilities prior to final upland placement, as stated in the example solicitation DACW51-03-B-0001, in the basic section 2900 page 2, 3,7&10. In future contracts, the monitoring of the transportation of material to the processing facilities will become the responsibility of the CQC.

- Specific contract requirements to minimize impacts to water quality are included to preclude spillage of material from disposal scows, while loading, while in transit, and during placement.

- No barge overflow of HARS unsuitable material is permitted.

- GPS tracking (ADDIS) of all transportation of material for ocean disposal is required.

- Specific environmental bucket requirements must be satisfied for dredging of HARS unsuitable material. Submittal requirements for this bucket must be satisfied prior to mobilization to the contract area, as stated in the example solicitation DACW51-03-B-0001, in the basic section 2900 pages 10 thru 12.

- Specific hoist speed requirements are included to control turbidity during dredging of HARS unsuitable material.

Air:

- The apparent low bid contractor is required to submit, 35 days after bid and prior to contract award, an air emissions calculator demonstrating control of NOx emissions during construction. Control of NOx is a requirement of the Clean Air Act.

- The contractor is required to employ an experienced professional Air Emissions Consultant, to insure compliance with all air emissions requirements.

- The Contractor is required to submit a Monthly Air Emissions report, and equipment operational data.

Protection of Fish and Wildlife and Endangered Species:

- The contractor is prohibited from work during environmental exclusion periods identified in the specific contracts. “Windows” are intended to protect historical wildlife populations, communities and /or habitat.

- Pursuant to the WQC and contract specifications issued for each project, the Contractor is required and having endangered species observers on tugs or hopper dredges during disposal operations.

- In addition, contractor is required to install sea turtle deflectors on all hopper dredge's dragheads and baskets on inflow to facilitate turtle observations.

Noise Monitoring Program:

- Baseline noise levels are established by an independent Architectural & Engineering Professional Consultant prior to the start of contract work, for areas contingent to & in the vicinity of the contract area.

- Contractor is required to implement an acceptable program for noise control, and to comply with all Federal, State & Local noise restrictions. Acceptable plans include provisions and strategies for minimizing noise from all equipment including dredges, disposal barges, drill platforms and tugs.

- Contractor is required to monitor noise levels daily to insure compliance.

- COE QA activities include verification noise monitoring throughout the duration of contract work. In addition, the COE employs an A&E professional Noise Consultant to augment its verification monitoring activities.

Blasting Plan and protection of property, and Cultural resources:

- The Contractor is required to employ an acknowledged professional blasting consultant to prepare and submit an approvable contract blasting plan.

- The consultant is required to perform vibration monitoring to protect property, and protect cultural resources.

5. Should you require any additional information, please call the undersigned @ 201 433-9228.

Ronald D. Conetta, P.E.
Acting Area Engineer

Appendix D

Inspections

D2 – INSPECTIONS

1 Inspections

INSPECTION (1965 APR OCE)

Quality construction is a primary goal of the Corps of Engineers. Managing quality construction is vital to the Corps' reputation and future. The plans and specifications establish the requirements of a contract that the Contractor must be in compliance with. The Corps uses a Quality Assurance/Quality Control management system. The Contractor is responsible for controlling the quality of the work and the Government, in separate but coordinated efforts, assures that the level of quality set by the plans and specifications is achieved.

The Government and the Contractor both have a role in obtaining quality construction consistent with the contract requirements. On dredging contracts where open water placement is required the following three inspectors are required.

- USACE Construction Field Office Inspector (QA Inspector)
- Contractor's Quality Control Inspector (CQC Inspector)
- Certified Disposal Inspectors (CDI)

The following summarizes the responsibilities of the Government and the Contractor:

- Prior to the start of a project the Government prepares a Quality Assurance Plan which addresses the overall Quality Assurance operations of the field office which is responsible for administering the contract. This plan identifies the Quality Assurance organization and the procedures/methodologies that will be used in carrying out their responsibilities. USACE Construction Field Office Inspectors (QA Inspectors), headed up by a Resident Engineer, are responsible for carrying out the following Government Quality Assurance responsibilities: (1) establishing construction standards and quality control requirements; (2) maintaining construction management activities, including, among others, checking adequacy of contractor's control (quality assurance for acceptance), performing specified tests and inspections as designated in the contract, determining that reported construction deficiencies have been corrected; (3) determining payments due to the contractor; and (4) assuring timely completion.

- After the award of the contract, the Contractor prepares a Contractor's Quality Control Plan that identifies their Contractor Quality Control organization and documents the process and methodologies that will be used to accomplish the Contractor's Quality Control responsibilities and ensure that the requirements of the contract are met. Contractor Quality Control Inspectors, headed up by a Contractor Quality Control (CQC) System Manager, are responsible for ensuring the following Contractor's Quality Control responsibilities: (1) producing a quality product on time and in compliance with the terms of the contract; (2) establishing and utilizing a construction quality control program of the scope and character necessary to achieve the quality of construction outlined in the contract; and (3) producing and maintaining acceptable records of its quality control activities. For dredging projects that require open water placement, Certified Disposal Inspectors (CDIs) approved by the Corps are required, in addition to the Contractor Quality Control Inspectors. The CDIs are financially employed by the Contractor but their duties and requirements are established by the Corps.

In order to minimize, to the extent practicable, resuspension of sediment into the water column, NJDEP and NYSDEC umbrella WQCs and specific contract reach WQCs, (*e.g.* S-KVK-2 Contract Reach) issued for the HDP provide project- specific BMPs for the dredging contractor to follow. Some BMPs listed in the states' WQCs are: (1) A "No Barge overflow" on contaminated, non-HARS, silty material, (2) Closed clamshell environmental bucket dredge on non-HARS suitable material, (3) Clamshell bucket hoist speed of 2 feet per second or less (Hoist Speed), (4) Maximization of clamshell bite, (5) Deliberate placement of material into barge (to prevent spillage), and (6) Silt curtains to protect sensitive habitats (where practical).

For purposes of Quality Assurance, a USACE Construction Field Office **I**nspector (QA Inspector) monitors dredging activities. See Appendix D with document titled, "MFR" . NYSDEC umbrella WQC special conditions provides for an "Inspector's Form" to be filled out several times a week and submitted to NYSDEC on a weekly basis by the Corps Field Office staff. This "Inspector's Form" contains information such as the following (Note: this is not an all inclusive list from the Inspector's Form): (1) Date and time of inspection, (2) Type of bucket, (3) Flaps on environmental bucket intact and operable, (4) Hoist speed, (5) No barge overflow (if appropriate), (6) Placement of dredge material in barge, and (7) Corrective action taken (if necessary).

For additional Quality Control, USACE Planning Division staff, consisting of environmental scientists, will be conducting unannounced inspections using the same "Inspector's Form" as the USACE Field Office staff of engineers. Inspections are proposed to occur (for the S-KVK-2 Contract) from 4 locations: on the dredge, from an alternate vessel on the waterbody, from the shorelines of Bayonne, NJ and Staten Island, NY.

In addition, both states' umbrella WQC special conditions provide for a "Dewatering Form" to be signed / verified by both the Quality Control Officer (Contractor) and a USACE Field Office Project Engineer and submitted to the state agencies on a weekly basis. This "Dewatering Form" contains information such as: (1) Dredge scow identification, (2) Date of discharge into decant scow, (3) Start and stop time of discharge into decant scow, (4) Rate of pump used to discharge into decant scow, and (5) Volume of discharge into decant scow.

Both forms (Dewatering and Inspector's Form) allow for USACE to monitor the contractor's performance as well as serve as a record to update the states on the status of compliance with the WQC conditions.

USACE will be initiating and performing, for the life of the project, an intensive and comprehensive water quality monitoring program that will not only include monitoring of the usual physical parameters, (*e.g*. salinity, dissolved oxygen, temperature, etc.) but also a Total Suspended Solids (TSS) and Turbidity Monitoring Program. The TSS multidimensional study will sample suspended solids, in mg/L, in the water column due to dredging activities. This extension of the previous USACE 2002 Arthur Kill, Newark Bay, Kill van Kull TSS program will survey larger areas containing silt material for longer durations. The specifications of this program are being coordinated with both states. This data will be compared to the existing ambient TSS levels within the waterbody which will allow for the USACE to confirm/validate the feasibility phase's turbidity model assumptions that defined the extent, duration and density of the dredge-generated sediment plume; supporting USACE's 1999 and 2004 NEPA determinations as well as providing near real time data to agencies such as the USEPA, NJDEP, and NYSDEC for their consideration of additional or new BMPs, and other suitable measures to minimize resuspension in future dredging activities in the New York Harbor.

The Government Quality Assurance inspectors and the Contracting Officer's Representative (COR) at the site of the work have certain direct and indirect authority to assure that the work is being performed in compliance with the plans and specifications. The presence or absence of an inspector shall not relieve the Contractor of responsibility for the proper execution of the work in accordance with the plans and specifications.

The Contracting Officer and the COR, reserve the right to have Corps of Engineers and/or the Environmental Protection Agency and the States of New Jersey and New York Inspectors accompany all trips to the placement site to certify compliance with the requirements of the contract.

1.1 Contractor Quality Control (CQC) System

Contractor Quality Control (CQC) is the system by which the Contractor bears responsibility for all activities necessary to manage, control and document work to comply with the plans and specifications and the terms of the contract. It encompasses all phases of the work, such as approval of submittals, procurement, storage of materials and equipment, coordination of subcontractor’s activities, and the inspections and tests required to ensure that the requirements of the contract are met, with a goal of delivering the required end product.
For a quality control program to be effective there must be a planned program of actions and lines of authority, and responsibilities must be established, as described in the Contractor’s Quality Control Plan.

The Contractor shall be responsible for complying with the requirements of Specification Sections 01312, Quality Control System, and 01451, Contractor Quality Control, for the details and requirements of the CQC Management System.

Items to be included in the Contractor’s Quality Control Plan are:

- A CQC staff of adequate size and technical capabilities to accomplish all quality control functions in a timely manner.

- Supervisory staff should have adequate time for CQC activities, as well as their many management responsibilities.

- Organizational lines of authority and responsibility must be clear and logical.

- Explanation of the control, inspection, and test procedures, both on site and off site, and a list of individuals on the CQC staff, with assigned responsibilities.

- Qualifications of the staff should match the control requirements of the plan and an individual’s qualifications must be adequate for the duties assigned.

- Contractor’s system for tracking construction deficiencies to ensure corrective action is taken in a timely manner.

- The plan must strongly emphasize that quality will be obtained through a preventive type of control of each definable feature of work. This requires an understanding of a definable feature, as discussed later on in this guide. The plan will include a listing of proposed definable features of work.

- Description of procedures for processing submittals and responsible parties for approving each submittal.
- List of tests to be performed, party responsible for the results, and party responsible for preparing and signing reports.
- Inspection and test report forms must be comprehensive.
- Frequency of reporting and time for submitting reports must be indicated.

1.2 Contractor Quality Control (CQC) System Inspections

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause entitled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the contract requirements.

No dredging operations shall be done unless the CQC System Manager, approved by the Contracting Officer or Contracting Officer Representatives (COR), is present.

The CQC organization, which includes the CQC System Manager and additional qualified personnel, must at a minimum possess general corporate technical knowledge of all aspects of the project, and must successfully execute the CQC System on all aspects of the project. Individuals possessing experience in specialized areas shall be added to the organization as required during periods when such specialty areas are being executed. Examples of such specialized areas include marine operations, marine safety, dredging and disposal, underwater rock drilling and blasting, seismic and noise monitoring, blasting safety, marine diving, hydrographic surveying, sample acquisition and testing. The Contractor must demonstrate that such additional qualified personnel have received sufficient training and indoctrination into the CQC system, and that these personnel properly execute the requirements of the CQC System within their areas of expertise.

a) CQC System Manager Qualifications

The Contractor shall identify as CQC System Manager an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The Contractor shall identify a CQC System Manager for each shift of work if construction is scheduled on a 24-hour basis. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, or shall hold a state Professional Engineer's license, with a minimum of 2 years construction experience on construction similar to this contract, one year of which as a Quality Control Representative. The CQC Manager may also be a construction person with a minimum of 4 years in related work, one year of which as a QC Representative. This CQC System Manager shall be on the dredge at all times during the dredging operation and will be employed by the prime Contractor. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the System Manager's illness or unavoidable absence. The requirements for the alternate will be the same as for the designated CQC System Manager. The CQC System Manager shall be assigned no duties other than Quality Control. The CQC System Manager or his alternate shall be on the floating plant at all times during the dredging operation.

In addition to the above experience and education requirements the CQC System Manager shall have completed within the last five years the course entitled "Construction Quality Management for Contractors". This course is given at a cost of $25 by Government personnel and is of two-day duration.

b) CQC System Representative Qualifications

The Contractor shall identify CQC System personnel for each shift of work if construction is scheduled on a 24-hour basis. The CQC System personnel shall have a minimum of 5 years construction experience on construction similar to this contract, one year of which as a Quality Control Representative.

In addition to the above experience CQC personnel shall have completed within the last five years the course entitled "Construction Quality Management for Contractors". This course is given at a cost of $25 by Government personnel and is of two-day duration.

c) **System's primary inspection responsibilities**

The CQC System's primary inspection responsibilities are to ensure that the Contractor performs the work in compliance with the requirements of the contract. The following identifies specific areas for this contract that need to be addressed in the Contractor's Quality Control Plan, which shall describe the specific methods and controls that will be put in place to demonstrate compliance with the contractual requirements:

1. Ensure that the material will be placed at the appropriate disposal site by noting the sediment description through visual inspection as it is loaded into each scow by the dredge operator (the person operating the backhoe or bucket filling each scow).

2. Ensure that material contained in each scow is documented with photographs and/or videos to ensure proper characterization of the dredged material and proper distribution of load.

3. Ensure that full-time inspection of the dredging operation is conducted and that compliance with the Best Management Practices and the Federal Consistency Determination/Water Quality Certification(s) conditions is maintained

4. Ensure that excessive dredging is minimized and that dredging below the allowable depth is minimized

5. Ensure that scows are properly loaded based on the characteristics of the dredged material to be transported, condition of the scow, and weather

6. Ensure that transport, processing and placement of Dredged Material "Unsuitable for placement at the HARS" are conducted in a safe and efficient manner and complies with all environmental laws and regulations

7. Ensure that transport and placement of Dredged Material at open-water placement sites (HARS, artificial reefs, or other open water placement locations) is conducted in a safe and efficient manner and complies with all environmental laws and regulations

8. Ensure that acceptance of dredged material "Unsuitable for placement at the HARS" at the upland facility is verified at the time of arrival

9. Ensure compliance with all Federal, State, and local noise ordinances and ensure that a noise monitoring program is implemented

10. Ensure that blasting operations and blast/vibration monitoring are conducted in a safe and efficient manner and comply with all environmental laws and regulations

1.3 Corps Certified Disposal Inspectors (CDI)

In addition to the Contractor's Quality Control Management System, the Contractor, at his/her own expense, shall have the NY District certified Inspector of Open-Water Placement of Dredged Material (Corps Certified Disposal Inspector(s)(CDIs)) oversee the transportation and placement activities of all dredged materials at the HARS and/or any other open-water placement location. A list of Corps Certified Disposal Inspectors (CDIs) may be obtained from the NYD Operations Division, Dredged Material Management Section. Only a CDI on the list may be used during the project. CDIs must complete USACE Transportation and Placement Log Forms (TPLFs) and checklists for all placement activities performed. The CDIs are required to be awake and on duty and in the towing vessel wheelhouse, to observe scow monitoring equipment function, watch for endangered species, and perform other Inspector duties, from the time the towing vessel departs from the dredging site until the scow has completely emptied and all reporting requirements have been completed. "CDIs will be responsible for documenting that the requirements contained in these specifications, and any other guidance and requirements provided to the contractor related to the transport and placement of dredged material at open-water placement sites are met." The CDI will help ensure that placement guidelines, particularly as presented during the pre-construction meeting, and described below, are being followed.

a. A list of Corps Certified Disposal Inspectors (CDIs) can be obtained from the USACE Ocean Placement Manager, Dr. Stephen Knowles, at (917) 790-8538. Prior to the project pre-construction meeting, the Contractor must submit to the New York District Operations Division the names, certification information, company affiliation and expected work schedule of all CDIs who will be working on the project. CDIs on duty at the beginning of the dredging project must be present at the pre-construction meeting to review placement guidelines and requirements associated with this project. Any CDI who begins duty after the first day of dredging must meet with NY District personnel to review placement guidelines and requirements associated with this project prior to working as a CDI on the project. Notice of replacement of a CDI must be submitted to NY District at least two weeks prior to beginning work, unless illness of a CDI or other unforeseen event prevents such notification. The Contractor must furnish CDI names, companies CDIs are affiliated with if not independent CDIs, and the expected duration of employment of replacement CDIs who will work on the project.

b. CDIs are not allowed to be on duty for more than twelve (12) hours per day. A CDI must be provided a minimum of eight (8) hours of continuous off-duty time each day to allow appropriate rest to ensure safety and competence. A CDI must be provided with a designated bunk space or other suitable sleeping location while working aboard a towing vessel and a suitable location for completing paperwork associated with CDI duties. The contractor is not permitted to direct the CDI in the performance of their CDI duties/requirements unless specifically requested by NY District. Although CDIs are financially employed by the Contractor, either directly or through sub-contracting, CDI duties and requirements are established by NY District. NY District will be responsible for determining whether CDIs are satisfactorily performing their duties and requirements. CDIs who do not fulfill their contractual requirement will be removed from the project by the Contracting Officer or Contract Officer Representative (COR)

c. The following items, provisions, accommodations, and supplies must be provided for the use of each CDI working on the dredging contract:

-Legible copy of the permit or contract specifications, as related to scow loading, transport, and dredged material placement;
-A legible copy of the Placement Guidelines and placement grid map received at the pre-construction meeting, or any additional instructions or guidelines as related to scow loading, transport, and dredged material placement;
-an 8" - 12" wide protractor with degrees printed or embossed on the curved surface;
-dividers for scaling distances off of maps and charts;
-scow loading tables for each scow used to transport dredged material;
-a fully operational, handheld laser range finder with a range of at least 1000 feet, and manufactured no earlier than 2001, must be available for use by the CDI at any time. Spare batteries for the laser range finder must be available at all times;
-access to the towing vessel DGPS, fathometer, and radar;
-fully operable personal cell phones in possession of each CDI at all times with active phone numbers unique to each phone available for placing and receiving calls at all times. Cell phone numbers must be provided to NY District at the pre-construction meeting;
-a fully operational fax machine must be onboard the towing vessel for use by the CDI within 2 hours of each placement event at the HARS, or within 4 hours of placement at an artificial reef.
-Any discrepancies or other concerns noted by the CDI regarding placement activities must be reported immediately, via cellular phone from the tug, to the NY District Operations Division (Alex Gregory, 917-790-8427) and a Dredging Contractor representative not onboard the towing vessel, and, if the issue is related to the scow monitoring equipment, the scow monitoring contractor. These contacts are referred to as the "Notification List". Additional items related to the duties of the CDI may be required at any time during the period of the dredging contract.

d. Responsibilities of Corps Certified Disposal Inspectors (CDI)

The CDI's inspection responsibilities pertain only to the transport and placement of dredged material at open-water Placement sites. The following summarizes the CDI's primary duties and responsibilities.

-CDI completes USACE Transportation and Placement Log Forms (TPLFs) and checklists for the transport and disposal of dredged material at open-water placement sites for each placement trip.

-CDI is required to observe scow monitoring equipment function and watch for endangered species, from the time the towing vessel departs from the dredging site until the scow has completely emptied and all reporting requirements have been completed.

-CDI is required to monitor scows for possible leaking of dredged material. Any material (rock, clay, till, sand, mud, water, etc.) contained in the scow is considered dredged material. Any loss of material from a scow, either from the top, bottom, sides, front, or back, is a leak of dredged material.

-CDI is responsible for documenting that the requirements contained in these specifications, and any other guidance and requirements provided to the contractor related to the transport and disposal of dredged material at Ocean placement sites are met.

-CDI is required to communicate with the towing vessel crew to obtain information necessary to document the position of the scow at the time placement occurs. In the event of a scow monitoring equipment/software malfunction, the CDI must complete a map of the placement area showing the position of the scow at the time the scow doors were first opened. In addition, the map shall include the distance from the towing vessel to the scow as determined using the hand-held laser range finder, or towing vessel radar, the heading of the towing vessel and scow, and towing speed, at the time of placement.

-CDI is responsible for photographing each scow loaded with dredged material after loading is completed.

-CDI is responsible for reporting and faxing discrepancies or unusual events as soon as possible to (212) 264-1463 and other numbers if required by NY District.

-The CDI is responsible for estimating the volume of dredged material in each scow using the dredged material density and scow draft at the start of each trip to the designated dredged material placement location, using a scow loading table associated with each scow used on the project.

-The CDI is responsible for monitoring marine weather forecasts and offshore data buoys to determine if weather and sea conditions will allow safe and accurate placement of dredged material. The CDI will discuss weather and ocean conditions expected at the placement site with the tugboat captain prior to leaving the dredging site and provide his/her opinion to the captain. The tugboat captain will ultimately decide if the weather and sea conditions will allow safe and accurate placement of dredged material.

1.4 Virtual Inspection

In addition to the on-site inspections performed by Government and Contractor personnel, virtual inspection through webcam(s) shall be available to Government and regulatory agency personnel.

Appendix E

Components of TSS Sampling Programs

Components of TSS* Sampling Programs	NYD's 2001/2005 TSS Sampling Programs	Bohlen Comments on TSS Sampling Program	NYD's 2006 TSS Sampling Program in NBSA
Turbidity readings using OBS**	Single water column profiles at relatively few points in time and at selected locations inside and outside of the plume	Stated inadequate spatial and temporal distribution of sampling effort.	At ambient location and in the central portion of the plume at several distances from the dredge. Deployments at multiple depths to provide time series data to capture temporal variation in plume structure.
Water Samples for Gravimetric Analysis of Total Suspended Solids (TSS)	At relatively few selected locations inside and outside of the plume. Samples were collected throughout the water column.	Stated inadequate sample size to determine relationship between turbidity and TSS measures.	Sufficient sample size to cover tides, depths, and entire range of suspended sediment concentrations. Samples collected with current OBS and ADCP measurements to determine site-specific relationships between optical, gravimetric, and acoustic measures of turbidity and TSS.
Acoustic Survey of Plume with an ADCP***	Not performed.	Stated limitations of 2001/2005 data to define plume boundaries and questioned appropriate selection of loss term for SSFATE.	Multiple surveys to determine the trajectories, boundaries, and three-dimensional structure of plumes during flood and ebb tides. Estimation of bucket dredge loss term. Support calibration of SSFATE model applications.
Acoustic Survey of Current regimes using an ADCP	Not performed.		Wide area coverage to support interpretation of plume behavior during tidal phases. Support SSFATE model applications.
Recorded video of Dredging cycle during Plume surveys	Not performed.		Provide record of the time sequence of all components of the bucket cycle during active dredging.
Sediment samples *in situ* and in barge	Not performed. Sediment samples were collected in each dredging area for OBS calibration		Verify geotechnical properties of sediments being dredged.

Past and Future USACE-NYD TSS Monitoring Programs Components for the HDP as Compared to Bohlen Comments

* TSS = Total Suspended Solids

** OBS = Optical Backscatter Sensors

*** ADCP = Acoustic Doppler Current Profiler