

**APPENDIX D**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2  
290 BROADWAY  
NEW YORK, NY 10007-1866

MAR 17 1997

Robert L. Callegari, Chief  
Planning Division  
U.S. Army Corps of Engineers  
Wanamaker Builder  
100 Penn Square East  
Philadelphia, PA 19107-3390

Class: EC-2

Dear Mr. Callegari:

The Environmental Protection Agency (EPA) has reviewed the draft supplemental environmental impact statement (SEIS) for the Delaware River main channel deepening project. This review was conducted in accordance with Section 309 of the Clean Air Act, as amended (42 U.S.C. 7609 12 [a] 84 Stat. 1709), and the National Environmental Policy Act. Since the proposed project would affect both EPA Regions II and III, this letter incorporates the results of both Regional Offices' reviews of the draft SEIS.

This project is being proposed in response to Congressional Resolutions; the Army Corps of Engineers (ACE) is seeking an exemption from the Section 404 permitting requirements, pursuant to Section 404(r) of the Clean Water Act. Under Section 404(r), the requirement to obtain a Section 404 permit is waived provided information is presented in an EIS to demonstrate that the effects of the discharge of dredge and fill materials, including consideration of the Section 404(b)(1) Guidelines, were evaluated. With this in mind, this comment letter includes EPA's evaluation of the project's consistency with the Section 404(b)(1) Guidelines.

In 1990, the ACE proposed to widen and deepen the existing Delaware River shipping channel. Under that proposal, the ACE would have dredged a total of 50.1 million cubic yards (CY) of material, with the channel requiring 6,156,000 CY annual maintenance dredging. Based on a review of the project's draft EIS, EPA raised environmental concerns regarding incomplete sediment analysis, designation of several environmentally sensitive disposal sites, and inadequate information on public water supply wells. The ACE coordinated closely with EPA to correct these deficiencies and to ensure that our concerns were addressed in the final EIS. As a result, a comment letter on the final EIS withdrew our objections, based on the ACE commitment to comprehensively evaluate a variety of environmental issues and prepare site-specific environmental assessments for the upland disposal sites, as part of the preconstruction, engineering, and

design (PED) phase of the project. The draft SEIS discusses the results of the completed PED studies.

The current federal channel depths restrict efficient use of both present and future tankers, dry bulk carriers, and container vessels. The recommended plan of improvement involves deepening the existing navigation channel from 40 to 45 feet below mean low water (MLW), with an allowable dredging over-depth of one foot. The modified channel would follow the existing channel alignment from Delaware Bay to Philadelphia Harbor and Beckett Street Terminal, Camden, New Jersey, with no change in channel widths. The plan also includes channel bend widenings, as well as partial deepening of the Marcus Hook Anchorage to 45 feet.

The ACE now proposes to dredge 33.4 million CY of material, plus 229,000 CY of rock, a reduction from the original proposal. The 45-foot channel would require approximately 6,007,000 CY annual maintenance dredging. In the riverine portion of the project area, dredged material would be placed in upland disposal sites. A portion of the dredged material from the Delaware Bay section of the project has been designated for beneficial use purposes; the rest of the material would go to the existing open water site, Buoy 10, near the mouth of the Bay.

An interagency meeting was held by the ACE on February 7, 1997, to answer outstanding questions about the project, and to present additional information. Based on our review of the document and the information obtained at this meeting, we offer the following comments.

Much of the dredged material from the Delaware Bay portion of the project area was designated for beneficial use purposes. In particular, wetland restoration sites have been proposed at Kelly Island, Port Mahon, Delaware, and at Egg Island Point, New Jersey. The tidal marshes in these areas had been impacted by severe erosion. The proposed plan would dispose of the dredged material behind a berm to allow the re-establishment of the salt marsh (Egg Island Point) or to manage the area as an impoundment for waterfowl (Kelly Island). Approximately 225 acres of mostly subtidal habitat would be restored to intertidal habitat.

Since the release of the draft SEIS, additional sampling of channel sediments reveal a significant decrease in the amount of silt that would be available for the Kelly Island restoration site. Specifically, the quantity of silt has been reduced from approximately 1 million cubic yards (CY) to 200,000 CY, with a concomitant increase in the amount of sand. Based on this change in available material, the ACE designed a new site plan which was

presented at the aforementioned interagency meeting. The design plan creates a sand berm using one geotextile tube to enclose the site. The sand berm will provide more horseshoe crab habitat than the original design.

Based on our review of this plan, it is unclear if the Kelly Island site is to be managed as an impoundment or tidal marsh. We would prefer that it be managed for salt marsh restoration, as that would provide more valuable wetlands and coastal aquatic functions and values. It is also not clear if the ACE, the U.S. Fish & Wildlife Service (USF&WS), or the Delaware Department of Natural Resources and Environmental Control will be managing water levels. The final SEIS should include a management plan for the new site design clarifying the environmental resource management objectives for the site, identifying the responsible agency, and containing a project schedule to achieve the stated goals.

Results of modeling show that there are no expected impacts on oyster survivability or growth during normal or storm conditions except possibly at Kelly Island during the month of August. The final SEIS should include a contingency plan that will address repairs to any breach or potential breach at the Kelly Island site. With regard to the Egg Island Point site, we have no concerns regarding its use as a wetlands restoration site. It is understood that the ACE will implement a monitoring plan for both sites to prevent impacts to nearby seed and leased oyster beds. EPA requests the opportunity to review the operation and maintenance manuals, which will include the monitoring plans.

The other beneficial use of the dredged material would be the nourishment of Slaughter and Broadkill Beaches in Delaware. The material would be placed in stockpiles less than 0.5 miles from shore. This stockpiled sand will be made available for beach nourishment purposes when the situation permits. Sand that migrates from the stockpile sites will move predominantly shoreward, providing nourishment for the beaches.

The draft SEIS contains a thorough analysis of the benthic assemblages and the impacts of the project on these resources. Both the Slaughter Beach and Broadkill Beach benthic communities would be affected in the short- and long-term by use as sand stockpile sites. The area of bay bottom and its benthic communities that will be impacted is approximately 730 acres. The Broadkill Beach site will change from a muddy sediment habitat to a coarse sand habitat. At both sites, benthic assemblages will be buried from emplacement of dredged material. If the areas are used for future beach nourishment projects, the

1. The redesign of Kelly Island is described in Section 3.3.3.2 of this final SEIS, which includes a detailed management plan which states environmental resource management objectives and a project schedule. As requested by the DNREC, this site will be contained by a sand berm with a geotextile tube core. It will have water control structures for post-construction wetland management and tidal flushing that allows for the exchange of fish and other aquatic organisms. Within the structure, a 60 acre tidal *Spartina alterniflora* marsh is expected to develop. The site will be managed by the DNREC. Properly constructed and managed impoundments in the Delaware Estuary do not adversely impact important fish species. Although fish diversity is slightly reduced within impoundments when compared to the open estuary, total diversity is increased several times. A significantly greater variety of plants, birds, mammals, and invertebrates can be supported in properly managed impoundments than in almost any other wetlands.

In the Kelly Island project, an enclosed impoundment is believed to be necessary by the DNREC to protect valuable and limited shellfish populations. Without dikes, the it is possible that the fine grained material would be redistributed over the bay substrate impacting clam and oyster beds, as well as any submerged aquatic vegetation that may be present, by increasing turbidity. Fine grained dredged material which is pumped into an enclosed impoundment is unlikely to escape in suspension and will settle to form a consolidated bottom suitable for reclaimed emergent wetlands. Once filled and consolidated, the Kelly Island restoration will revert to emergent wetlands, providing a diverse biological community that can be maintained through water level management.

2. Due to the re-design of the Kelly Island, we no longer believe that an extensive contingency plan for Kelly Island and monitoring program for oysters are necessary, as Corps will monitor, repair and maintain the Kelly Island wetland restoration area. However, the oyster beds and lease areas will be sampled prior to project construction to develop baseline information. In the unlikely event that a breach occurs at Kelly Island, further sampling will be done to assess any impacts. Please refer to Section 3.3.4.2.

3. During the Plans and Specification phase of this project, the economic viability of placement of dredged material directly on the beach including Broadkill to reduce the amount of material to be stockpiled will be investigated.



repeated disturbances could result in long-term impacts. The ACE prepared a feasibility plan in September 1996 for shore protection for Broadkill Beach that included beach fill. The final SEIS should address the placement of dredged material directly on Broadkill Beach. This would reduce the amount of material to be stockpiled, and eliminate the need for the double handling of material and its associated environmental impacts. If this is not feasible, other opportunities for beneficial uses should be explored, including direct placement of sand on beaches for shore protection, or placing more sand at the wetland restoration sites.

The draft SEIS states that dredged material from the Delaware River would be disposed of in existing federal disposal areas, along with four proposed disposal sites, all of which are located in New Jersey. Approximately 396 acres of wetland, dominated by Phragmites australis, will be impacted on the four sites by the disposal of dredged material. In order to minimize impacts to wetlands/wildlife habitat in the upland dredged material disposal areas, the ACE has developed a management plan, in conjunction with the New Jersey Department of Environmental Protection (NJDEP). Part of the plan entails dividing each of the four new disposal sites into cells and, through the use of water control structures and contouring, manipulating the variety and type of habitat that will occur. The ACE estimates a net increase from this project of 200 acres of wetlands over the life of the project as a result of the management plan. The ACE will also purchase 372 acres of high quality wildlife habitat, including some tidal marshes, which will be maintained as undeveloped land. We concur with the ACE plan for the use of the upland dredged material disposal sites.

The PED studies included follow-up sediment sampling that indicates the sediments that would be disposed of at the upland sites were compared to the NJDEP Residential, Non-Residential and Impacts to Groundwater Soil Cleanup Criteria; additional bioassay tests were performed on sediments that would be disposed of at the beneficial use sites. These tests showed no toxicity or bioaccumulation of any significance; therefore, EPA continues to believe that there will be no adverse impacts associated with the disposal of sediments generated by the project.

At the time of the draft EIS, we expressed concerns about salt water intrusion and possible impacts on drinking water quality and aquatic ecosystems. One of the PED studies was a three-dimensional hydrodynamic modeling of the Delaware Estuary to evaluate potential changes in salinity and circulation patterns. The study uses the CH3D-WES hydrodynamic model to investigate the

4. Comment noted. No response required.

5. Comment noted. No response required.

6. Comment noted. No response required.

impacts of the deepening of the navigation channel on water uses and living resources. The model was verified with one year of field data and data from the June-November 1965 portion of the drought of record. The model successfully reproduced the drought event and predicted that a maximum penetration of the salt line of from 1.4 to 4.0 miles would result from the deepened channel and a recurrence of the drought of record.

Our review indicates that the predictive capability of the model is very good. With the new channel in place, the EPA criteria for chlorides and the New Jersey standards for sodium in drinking water will not be violated in the areas of water withdrawals for municipal needs. The computed chlorinity under most adverse conditions will remain well below the current and projected Delaware River Basin Commission (DRBC) water quality standards for designated locations for natural and regulated flow patterns. Therefore, it appears that the water supply in Philadelphia, among other uses, will not be adversely affected. Also, the chlorinity standard established by the DRBC to protect the Potomac-Raritan-Magothy aquifer will not be exceeded.

Based on the model results, we concur that the predicted increases in salinity/chlorinity attributable to the channel deepening will probably have insignificant impacts to drinking water, ground water, and environmental resources.

In a related matter, the proposed project is located within the New Jersey Coastal Plain Aquifer System, which has been designated as a sole source aquifer (SSA), pursuant to the Safe Drinking Water Act (SDWA). Based on our review, we do not anticipate that this project will result in significant adverse impacts to ground water quality. Accordingly, the project satisfies the requirements of Section 1424(e) of the SDWA.

In our comment letter on the final EIS, we requested that a commitment regarding oil spill response be reflected in the Record of Decision. The draft SEIS states that a Marine Spill Analysis System has been developed by the ACE, NJDEP, USF&WS, and the Environmental Systems Research Institute. We concur that this system, and the response network in place, is adequate.

In conclusion, based on our review and in accordance with EPA policy, we have rated this draft SEIS as EC-2, indicating that we have environmental concerns (EC) about the design and monitoring plan for Kelly Island, and the stockpiling of sand at Slaughter and Broadkill Beaches. Accordingly, additional information (2), as outlined in this letter, should be presented in the final SEIS to address these issues. We concur with the Section 404(b)(1)

7. Comment noted. No response required.

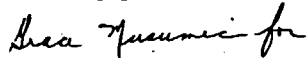
8. Comment noted. No response required.

9. Additional information concerning the design and monitoring plan for Kelly Island has been included as part of this final SEIS in Sections 3.3.3.2 and 3.3.4. Concerning the stockpiling of sand offshore in the vicinity of Slaughter and Broadkill Beaches, additional investigations, as suggested, will be conducted as part of the Plans and Specification phase of this project.

Guidelines analysis which states that the proposed project is consistent with the Guidelines.

I would like to commend the ACE for its extensive effort and cooperative spirit in resolving EPA's environmental concerns about the project. I look forward to our continued coordination in the subsequent phases of this project. In the interim, if you have any questions, please call Deborah Freeman, of my staff, at (212) 637-3730.

Sincerely yours,



Robert W. Hargrove, Chief  
Strategic Planning and Multi-Media Programs Branch

cc: J. Brady, ACE ✓



IN REPLY REFER TO:

## United States Department of the Interior

### OFFICE OF THE SECRETARY

Office of Environmental Policy and Compliance  
Custom House, Room 244  
200 Chestnut Street

Philadelphia, Pennsylvania 19106-2904  
March 11, 1997

ER-96/816

Lt. Colonel Robert B. Keyser  
District Engineer, Philadelphia District  
U.S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390

Dear Lt. Colonel Keyser:

The Department of the Interior (Department) has reviewed the Delaware River Main Channel Deepening Project Draft Supplemental Environmental Impact Statement (DSEIS). The DSEIS addresses modifications to the existing Delaware River federal navigation channel between the Philadelphia / Camden waterfront and southern extent of Delaware Bay. The proposed project involves activities in New Jersey, Pennsylvania, and Delaware.

#### GENERAL COMMENTS

The U.S. Fish and Wildlife Service (FWS) provided the U.S. Army Corps of Engineers, Philadelphia District (Corps) with numerous reports and recommendations throughout the planning of this project. The most recent reports include: a Fish and Wildlife Coordination Act Section 2(b) Report, dated June 1992; a Planning Aid Report on upland disposal sites, dated July 1995; and, a Planning Aid Report on beneficial use of dredged material, dated August 1995. These reports identify numerous impacts on fish and wildlife resources and related data gaps, and provide recommendations for additional studies and methods to minimize impacts on fish and wildlife resources. The most significant issues identified in the reports are: contaminants within the dredge spoil; potential project-related adverse impacts on federally listed species; alterations in salinity and circulation patterns in the Delaware Bay and River; mitigation of adverse effects to habitat due to upland disposal of dredged material; habitat enhancement opportunities on upland disposal sites; seasonal restrictions to protect anadromous fish and shorebirds; impacts on benthic invertebrates from subtidal dredged material disposal; and, beneficial use of dredged material such as wetland creation and beach nourishment.

The FWS and the Department believe that the DSEIS adequately addresses many of these issues, including contaminants, federally listed species, and most concerns regarding mitigation of adverse impacts. However, the DSEIS does not adequately address several issues of concern that relate to upland disposal sites, wetland restoration, sand stockpiles, hydrodynamic and salinity modeling and other issues, as detailed in the following section. We request that the Corps give these concerns and recommendations further consideration in completing the final SEIS.

#### DETAILED COMMENTS

##### Upland Disposal Sites

The Corps proposes to manage the four new upland disposal sites for the enhancement of fish and wildlife habitat by managing water levels to retain standing water, sequentially using these sites, and splitting the disposal

1. sites into management cells. However, the Corps does not address the management of the nine existing upland disposal sites in the DSEIS. Section 204 of the 1992 Water Resources Development Act (WRDA) (P.L. 102-580) authorizes the Corps to carry out projects for the protection, restoration, and creation of aquatic and ecologically related habitats, including wetlands, in connection with dredging for construction, operation, or maintenance of an authorized federal navigation project.

We understand that the Corps is hesitant to enhance wildlife habitat within existing upland disposal sites, pursuant to Section 204 of the WRDA, because of potential seasonal restrictions on disposal imposed by State and / or federal natural resource agencies to protect fish and wildlife, particularly threatened or endangered species. However, such restrictions are possible under the existing management of these sites. Therefore, the Department recommends that the Corps pursue a Memorandum of Understanding with appropriate State and federal natural resource agencies in order to minimize the potential for temporal or spatial restrictions on dredge material disposal for the nine existing upland disposal sites. The Department also recommends that the Corps manage the existing upland disposal sites using the same methodology proposed for the four new upland disposal sites. The Corps should also consider partnerships with non-profit conservation organizations to share the financial costs of managing the existing upland disposal sites for the enhancement of fish and wildlife.

The DSEIS states that the new upland disposal sites would be committed to open space/environmental uses after project completion in 2050. The Department recommends that the Corps place conservation easements or deed restrictions on all proposed new and existing upland disposal sites to ensure that these areas are protected as fish and wildlife habitat in perpetuity.

#### Wetland Restoration

2. The Corps proposes to follow seasonal restrictions defined by the Delaware River Basin Fish and Wildlife Management Cooperative to protect anadromous fish and other finfish within the Delaware River and Bay. The Department also recommends that the Corps avoid construction of the Kelly Island and Egg Island Point wetland restoration areas between April 1 and June 30 to avoid adverse impacts on spawning horseshoe crabs and migrating shorebirds.

3. The Department understands that the proposed design for the Kelly Island wetland restoration project has been modified to include a geotube buried within a sand dike (+10 at mean low water) on the bayward side of Kelly Island. Additionally, the modified design would have one weir instead of two, as previously proposed, and would be managed as an impoundment. The final SEIS should make it clear that the footprint for the Kelly Island project is currently under the jurisdiction of the State of Delaware. Therefore, the Department recommends that the final SEIS clearly identify the Kelly Island design and the entity which will be responsible for management and maintenance of the Kelly Island project. The Department is also concerned about the stability of dredged material within a wetland restoration site that is designated as an impoundment. The Department recommends that the Corps coordinate with State and federal natural resource agencies to define guidelines or standards that would apply to the Kelly Island wetland restoration site. The standards should include minimum areal coverage (e.g., 50 percent) of desirable, volunteer, native species that would be maintained through the project life.

4. Conflicting information is presented in the DSEIS regarding the stability of the crest elevation of the geotextile tubes. The Corps states that "the final crest elevation achieved during construction will remain" (page 3-47). However, the Corps also states that "as the tube slowly settles and consolidates, the initial elevation of the crest achieved during construction

1. The nine existing Corps disposal areas are used for disposal of dredged material from maintenance of the existing 40 foot project. These sites are vital for continued maintenance of 40 foot project and any long term use restrictions would jeopardize the maintenance of that project. One existing disposal site, the Kilcoohook disposal area, is already being managed for wildlife habitat by the U.S. Fish and Wildlife Service. To enhance wildlife habitat within remaining existing disposal sites, Section 1135 (b) of WRDA 1986 would be more applicable than Section 204 of the WRDA 1992.

In order to conduct an investigation under Section 1135 authority, a non-Federal sponsor would be required who is willing to provide 25% of the costs of implementation and assume full maintenance responsibility. Any habitat improvements at existing disposal areas would require development of a Memorandum of Understanding, as suggested.

At this time, conservation easements or deed restrictions on existing or proposed sites cannot be imposed. This could be possibly be considered at a later time when the sites are reaching their ultimate capacity.

2. As discussed in Section 3.3.4.3, construction of Kelly Island and Egg Island Point will be done in a phased, timed technique to avoid and minimize impacts to spawning horseshoe crabs and migrating shorebirds. It would not be practicable to entirely avoid the period from April 1 to June 30 because the filling of geotextile tubes is very time consuming and needs to be done under favorable weather conditions, which occur in the spring and summer. However, the present habitat at both wetland restoration sites consists of eroding peat banks that is not suitable horseshoe crabs spawning habitat. In addition, shorebirds tend to feed on freshly placed dredged material because of the food present, so the placement of new dredged material will not adversely impact them.
3. The final SEIS has been revised to include the redesign of Kelly Island wetland restoration, which will be managed by the DNREC. The Kelly Island sand berm will be maintained by the Corps of Engineers. The DNREC plans to manage Kelly Island so that it will develop into a *Spartina alterniflora* marsh. Concerning the design, the Corps has adhered to Corps standards and used standards from similar projects that have been constructed. Regarding, the species that will be maintained through the project life, additional coordination will be done with the agencies during the Plans and Specifications phase of the project.
4. Fill material composed of sand will consolidate very little after filling. In the Kelly Island and Egg Island Point projects, the tubes will be filled with sand and so only minor consolidation of the tube crest will occur after construction is completed. The final SEIS will be modified to explain this. The consolidation of the existing bottom was accounted for in the design of the entire beach and tube structure.

will be reduced over time, and become half of the original height." The Department recommends that this discrepancy be corrected in the final SEIS. The Corps notes that "strong winter northwesterly winds may induce some offshore-directed sediment motion," but incorrectly discounts the potential impact on oysters (*Crassostrea virginica*) based on their virtual dormant condition (page 9-13). Heavy sedimentation could smother oysters particularly in the winter when the oysters' pumping rate is reduced and they are unable to displace sediment. In addition, the Corps should consider other potential impacts to oysters besides the interruption in filter feeding (page 9-14). A silt deposit of as little as 1 to 2 millimeters on the shells and other hard surfaces at the oyster bars may inhibit the setting of oyster larvae. The Department recommends that the Corps address this sedimentation issue in the final SEIS.

5.

The Corps' proposed contingency plan to determine the baseline condition of the oyster population, which could be used to detect a project-induced change, will be complicated by the natural fluctuations in abundance, size, and disease prevalence (page 9-21). Therefore, the Department recommends that the Corps monitor turbidity and siltation as part of the contingency plan to account for additional project-induced changes.

6.

Kelly Island is part of the Bombay Hook National Wildlife Refuge. As such, the Corps' use of the Kelly Island site for dredged material disposal will require a Special Use Permit from the Service, pursuant to the National Wildlife Refuge System Administration Act of 1966 (80 Stat. 927, 16 U.S.C. 668dd-669ee). Application for a Special Use Permit should be made to the Refuge Manager at the following address:

7.

Refuge Manager  
U.S. Fish and Wildlife Service  
Bombay Hook National Wildlife Refuge  
2591 Whitehall Neck Rd.  
Smyrna, Delaware 19977  
(302) 653-9345

#### Sand Stockpiles

The Corps proposes to establish two sand stockpile areas to provide material for beach nourishment at a later time. The proposal would result in the burial of 730 acres of subtidal habitat, resulting in burial of the benthic community and water quality degradation. In addition, since the sand stockpiles would be dredged for beach nourishment, recolonization of these areas by benthic invertebrates would be disturbed. For these reasons, the Department does not consider subtidal sand stockpiles an environmentally beneficial use of dredged material. We recommend reevaluation of the potential for additional wetland restoration and direct beach nourishment in order to avoid the adverse environmental impacts from sand stockpiles. At a minimum, a portion of the dredged material should be evaluated for direct beach nourishment at Slaughter Beach and Broadkill Beach in Delaware.

8.

In further considering alternatives to sand stockpiling, the Department recommends that the Corps consider linking federal projects that involve beach nourishment and wetland creation (e.g., Oakwood Beach, Cape May Villas, Reeds Beach, Maurice River in New Jersey and Lewes Beach, Broadkill Beach, Port Mahon in Delaware) with the Delaware River Main Channel Deepening Project to ensure the economic feasibility of providing dredged material to these areas. Direct beach nourishment or wetland restoration would eliminate double handling of dredged material and would eliminate adverse impacts on 730 acres of subtidal substrate, much of which provides high quality habitat for benthic communities. Avoiding double handling of dredged material may also reduce overall monetary costs of dredging the Delaware River and nourishing New Jersey and Delaware beaches.

9.

5. Since the distribution of the draft SEIS, the Kelly Island wetland restoration has been redesigned (See Response 3, above, and Section 3.3.3.2 of this SEIS), which greatly reduces the possibility of silt escaping and reaching the oyster bed areas. The amount of silt being placed in Kelly Island has been reduced from over 900,000 cubic yards to under 200,000 cubic yards. The silt will be enclosed in a containment area by a sand berm with a geotextile tube core for extra protection. The berm will not be overtopped except by the most severe storms that are only expected to occur once in 100 years. The previous design would have allowed tidal inundation with every tide. The revised design will allow tidal inundation, but only by controlled outlet structures. The entire Kelly Island structure will be monitored and repaired and maintained as necessary. The silt within the containment structure will be mixed with and covered by an additional 500,000 cubic yards of sand which will become vegetated and will provide an extra measure of protection. Because of all of the measures that are mentioned above, it is extremely unlikely that nearby oyster beds and lease areas in Delaware would be adversely impacted by silt escaping from the Kelly Island wetland restoration; and even more unlikely that the oyster areas in New Jersey, which are more than 4 miles away. This discussion has been added to Section 9.3 of this SEIS.

6. We no longer believe that a contingency plan for Kelly Island and monitoring program for oysters is necessary due to the revised design. See Response 5, above, and EPA Response 2.

7. The Corps of Engineers will apply for a Special Use Permit from the Refuge Manager at the Bombay Hook National Wildlife Refuge for the construction of Kelly Island wetland restoration.

8. An investigation of sand stockpile areas versus direct placement of sand material at Slaughter and Broadkill Beaches will be considered in the Plans and Specifications Phase.

9. Consideration (i.e., the economic viability) of direct placement of sand material to the beaches, as suggested would be addressed as Part of Plans and Specifications Phase.

10. The WRDA of 1996 (P.L. 104-303) directs the Corps to place a greater emphasis on the use of dredged material for beneficial uses including beach nourishment. Section 207 of the WRDA of 1996 specifically allows the Corps to select a disposal method that is not the least cost option if the incremental costs are reasonable in relation to the environmental benefits. As stated above, the Department recommends that the Corps avoid stockpiling dredge material subtidally and use the material beneficially (e.g., beach nourishment or wetland restoration), pursuant to Section 207 of the WRDA of 1996.

11. The Corps also proposes to dispose of maintenance dredged material from the Delaware Bay at Bouy 10. For the same reasons as identified above, i.e., adverse impacts to benthic invertebrates, the Department recommends that the Corps reevaluate the beneficial use of this dredged material for beach nourishment or wetland restoration.

12. According to the DSEIS, Site MS-19B has one of the highest quality benthic communities among the 12 potential beneficial use sites and would be expected to sustain greater adverse impacts due to the lower recovery potential of its benthic macroinvertebrate community (page 8-20). However, the Corps concludes that no significant differences were found between any candidate site and background conditions in Delaware Bay that would preclude their selection as a beneficial use site. No statistical analysis is presented in the DSEIS to support the Corps' conclusion that no significant differences exist between the candidate sites. However, the data presented in the DSEIS demonstrate substantial differences between candidate sites particularly with the high quality benthic habitats associated with MS-19B (selected as a sand stockpile area). The variation in the Shannon-Wiener Index among candidate sites between 0.34 and 3.19 is one indication that candidate sites support communities of different diversity. Therefore, the Department recommends that the Corps clarify and / or reevaluate the procedures used to select candidate sites. The Corps should provide appropriate justification for selecting high quality benthic sites (e.g., MS-19B) over low quality sites (e.g., NCH) or reselect candidate sites.

13. Additionally, the DSEIS conclusion that there will not be significant effects on the benthic resources at the stockpiling area is unfounded (page 8-18). The project is likely to have a significant effect on local benthic resources at the stockpiling sites due to changes in the sediment composition and depth. Depth reductions from 8 feet to 3 feet would likely increase exposure to wave energy making the bottom less stable and consequently less habitable for some benthic species. A more appropriate conclusion would be that the project would not have a significant effect on the diversity of the benthic resources of the Delaware Bay. The Department recommends that the Corps correct this discrepancy.

#### Hydrodynamic and Salinity Modeling

14. The hydrodynamic and salinity modeling detailed in the DSEIS indicates that the proposed changes in circulation and salinity as a result of the proposed Delaware River Main Channel Deepening Project would not result in any significant impacts on organisms within the Delaware River or Delaware Bay. This conclusion is based upon model results that have been verified with existing data. The Department concurs that the proposed project is not likely to have an adverse effect on organisms as a result of salinity or circulation changes within the Delaware River and Delaware Bay based on the model results. However, modeling results are not always consistent with actual results under field conditions. Therefore, the Department recommends that the Corps coordinate with the New Jersey Bureau of Shellfisheries and the Delaware Division of Fish and Wildlife to establish and implement a monitoring plan to evaluate changes in water quality and oyster populations within the Delaware River and Bay prior to, during, and following construction of the proposed project. The Department understands that, without intensive monitoring,

10. The applicability of Section 207 of WRDA 1996 to sand stockpile sites will be explored in the Plans and Specification phase.

11. For the wetland restoration sites (Egg Island Point, and Kelly Island), periodic nourishment will be required at these areas during the 50 year project life. The sand maintenance material will be utilized from the maintenance dredging of the 45 foot project. The silt material will be disposal at Bouy 10.

12. Table 8-8 (pg 8-13) of the DSEIS presents the statistical analyses to support the Corps' conclusions. For example, all of the statistically significant differences in diversity measures (i.e., number of species and Shannon-Wiener Index) were in the negative direction. That is total number of species, and the Shannon-Wiener Index at the candidate sites were significantly lower than background. Of the sites with higher diversity, no sites were significantly higher than background. The objective of the analysis, which was stated on page 8-3 of the DSEIS, was to compare the 12 candidate sites to background conditions of the Delaware Bay in order to determine if any benthic community attributes were unique or exceptional that would preclude the use of a candidate site as a beneficial use site. Statistical analyses were not performed between the sites because the goal of the analysis was not to select the least favorable site among the twelve sites. Although there was wide variation between candidate sites, the statistical analysis support the conclusion that none of the sites contained unique or exceptional benthic communities compared to background conditions of the Bay. No candidate sites had statistically higher diversity (as measured by number of species and Shannon-Wiener Index) than the background conditions of the Delaware Bay (Tables 8-7 and 8-8). In addition, of the unique species found at a candidate site, none were so important as to preclude the selection of a site for beneficial use (see page 8-4 of DSEIS). Variation in diversity measures exists between the candidate sites, however, no site contained unique or statistically higher diversity than background conditions. MS-19B was the only candidate site with a statistically higher bottom salinity than background conditions. Based on classic species and salinity graphs for estuarine environments, it is expected that sites with higher salinity will support higher numbers of species, yet MS-19B did not support statistically higher diversity than background. In addition, the higher percent abundance of equilibrium taxa can be attributed to one taxa, the bivalve *Tellina agilis*, a ubiquitous high salinity taxa, common along the mouth of the Delaware Bay (Maurer et al, 1974). Although it was concluded that MS19B supported the highest quality benthic community of the 12 candidate sites, this conclusion can mostly be attributed to the high salinity of the site. The benthic community at MS-19B was not unique or exceptional compared to background conditions and therefore should not be precluded from selection as a beneficial site.

It should be noted that in addition to biological screening, the locations of the beneficial use sites were selected based on economic considerations and if their locations would meet the intended objectives of beneficial use. In the case of the sand stockpiles, the sand stockpile sites needed to be located within a close proximity to the beaches so that beneficial use (i.e., access to sand material for future placement on the beach could be achieved by State of Delaware) of the dredged material could be realized.

13. Please refer to EPA Response 3. The final SEIS will be changed to reflect that no significant impact will occur to either the diversity or overall populations of benthic resources in Delaware Bay due the use of any of these sites as either wetland restorations or sand stockpiles.

14. It is the view of the District that the hydrodynamic/salinity modeling demonstrates that the predicted salinity impacts of the deepened channel are small enough to be considered negligible with respect to water quality and living resources. The hydrodynamic/salinity modeling demonstrated the range of potential salinity impacts due to the proposed deepening under a range of conditions, including a recurrence of the drought of record, the typical "transition" period at the end of the spring high-flow period, and also "average" inflow conditions. The use of the model to address concerns regarding salinity distribution was viewed as the most appropriate approach to apply in this matter. This approach was confirmed through coordination workshops held prior to and during the conduct of the modeling. In fact, modeling is the only valid approach which permits a direct and objective assessment of salinity impacts attributable to changes such as channel deepening. Even the most ambitious pre- to post-deepening monitoring effort would not be able to unambiguously determine if observed salinity differences or oyster population changes were the result of channel deepening, or as a result of some other cause. This is in part due to the dynamic natural range in salinity at most locations throughout the estuary, and in part due to the many variables other than salinity which affect the distribution and health of the oyster population.

attempts to link changes in water quality and oyster populations to the Delaware River Main Channel Deepening Project may be inconclusive. Monitoring would provide more reliable data to help identify any significant or substantial impacts on water quality or oyster populations that result from the project. Additionally, if no adverse impacts were observed on oysters, the monitoring would be valuable in verifying the model. The Department also suggests that the Corps coordinate the monitoring coincident with similar attempts being undertaken by New Jersey and Delaware.

#### Other Issues

15. The Department recommends that the Corps prohibit "economic loading" or barge overflow, particularly in areas where dredged material has been determined to be potentially toxic. Economic loading is a process where water pumped with dredged material into the dredge hopper is permitted to flow over the sides of the barge, resuspending potentially toxic material and increasing turbidity and sedimentation.

16. The information presented in the DSEIS indicates that 16 species of benthic invertebrates were so rare at the candidate sites that the sites are unlikely to be an important or unique habitat for these species (Page 8-4). The Department recommends that the Corps clarify whether these species are themselves rare, unique, or important within the Delaware Bay or in other major regional waterbodies (e.g., Chesapeake Bay).

17. Table 10-1 identifies the sensitive joint-vetch (*Aeschynomene virginica*) as a species under the jurisdiction of the National Marine Fisheries Service. This species is under the jurisdiction of the U.S. Fish and Wildlife Service. Additionally, the bur-marigold (*Bidens bidentoides*) is no longer a candidate species and should be eliminated from Table 10-1.

18. The Department requests that copies of all monitoring reports and contingency plans be sent to the Supervisor at the following address:

U.S. Fish and Wildlife Service  
New Jersey Field Office  
Ecological Services  
927 North Main Street, Building D-1  
Pleasantville, New Jersey 08232  
Telephone: (609) 646-9310

#### SUMMARY COMMENTS

The Department is pleased that the Corps has addressed many of the concerns previously identified by the FWS. However, we identify and seek resolution of several significant outstanding issues of concern regarding potential project-related adverse impacts on fish and wildlife resources. These issues include management of existing upland disposal sites, wetland restoration design and management, adverse effects of sand stockpiles on benthic invertebrates, and additional monitoring to document impacts to oysters and further verify hydrodynamic and salinity modeling. In order to resolve our remaining concerns and fully minimize adverse impacts to fish and wildlife resources, the Department recommends the following:

19. 1. Enhance wildlife habitat on existing upland disposal sites.
20. 2. Deed restrict or place conservation easements on all upland disposal sites.
21. 3. Avoid construction of wetland restoration sites between April 1 and June 30.

As an example of this "natural" variability, model data from RM 54 show that for the April - November 1965 simulation, salinity ranged between 6 and 17 ppt. For the same months with long-term averaged monthly inflow, salinity ranged between 1 and 9 ppt. Finally, during the April - May 1993 period, salinity never rose above 0 ppt. This represents a range of salinity from "fresh water" with 0 ppt salinity to "half-strength" seawater at 17 ppt. For perspective on the impacts of deepening, it should be noted that at RM 43 and RM 54, both in the vicinity of productive oyster habitats, the hydrodynamic-salinity model predicts that even the largest salinity change induced by deepening is less than 1 ppt, with most changes typically in the range of 0.1 to 0.5 ppt. It is the view of the District that the large, natural variability of salinity throughout the estuary renders the changes associated with deepening and sea level rise essentially a negligible environmental impact, and further, that monitoring does not ideally lend itself to assessing oyster population changes with regard to the effects of channel deepening.

The District coordinated findings from the salinity model with Rutgers University oyster researcher Dr. Eric Powell. Dr. Powell is a nationally recognized expert on oyster ecology, and concluded that the range of salinity changes predicted by the model would pose no adverse impact on oyster resources. It is our view that Dr. Powell's findings are valid and should be accepted as a reliable indicator of "no significant impact" on oysters in the Delaware Estuary. In addition, in their letter of March 17, 1997, the EPA stated that their review of the model indicates that its predictive capability was very good; and that, based on the model results, concurred that the predicted increases in salinity/chlorinity attributable to the project will probably have insignificant impacts to drinking water, ground water, and environmental resources. In summary, we believe that the model is the best available tool to predict salinity changes, and additional testing/monitoring is not necessary or practicable.

15. The Corps has been working with the Delaware Basin Fish and Wildlife Management Cooperative, Fisheries Technical Committee to develop an acceptable plan for implementing economic loading of barges and hopper dredges in the Delaware River. Based on the sediment quality data presented in the SEIS, and additional high resolution, congener-specific PCB analyses, the current proposal is to implement economic loading only below the Delaware Memorial Bridge. Based on the data collected to date, there are no indications that intermittent increases in turbidity, resulting from economic loading in this portion of the Federal navigation project, would have any adverse effects on aquatic organisms due to the release of chemical contaminants from the sediment.

16. In the examination of unique taxa collected at only one candidate site, 16 taxa were listed as extremely rare at the site ( $<2.0/m^2$ ) (pg. 8-4). The majority of these taxa were most likely rare in this study because they were at the limit of their habitat. For example, species such as *Pandora gouldiana*, *Tellina tenella*, and *Pherusa affinis* are found more commonly in marine shelf habitats than in tidal bay habitats. Other species such as *Paranaitis speciosa*, *Lysianopsis alba*, and *Podarke obscura* are not uncommon in Delaware Bay (Watling and Maurer, 1973). Additionally, some taxa were not sampled quantitatively with a grab sampler (i.e., the decapods *Ovalipes ocellatus* and *Panopeus herbstii*) or are most common on hard substrates not sampled efficiently with a grab sampler (i.e., *Idotea bathica* and *Aeginina longicornis*). Two taxa are genuinely rare in the Delaware Bay system, the gastropoda *Bittium alternatum* and the polychaeta *Phyllodoce groenlandica*. Neither of these two species were collected at the proposed restoration sites or the sand stockpile sites.

17. Concur.

18. Concur.

19. Please refer to Response 1.

20. Please refer to Response 1.

21. Please refer to Response 2.



22.

4. Coordinate with State and federal natural resource agencies to define guidelines or standards that would apply to the Kelly Island wetland restoration site, including minimum areas coverage (e.g., 50 percent) of desirable, volunteer, native species.

23.

5. Address and monitor potential sedimentation impacts on oysters adjacent to wetland restoration sites.

24.

6. Avoid using sand stockpile areas and Buoy 10, but instead use dredge material beneficially for beach nourishment or wetland restoration.

25.

7. Clarify and/or reevaluate the procedure used to select candidate sand stockpile sites.

26.

8. Monitor water quality and oyster populations prior to, during, and following dredging activities to verify salinity and circulation modeling.

The Department encourages the Corps to resolve the above-mentioned concerns and incorporate these recommendations in the final project design and the Final SEIS. The Department and the U.S. Fish and Wildlife Service will continue to cooperate fully in an effort to resolve these concerns.

If you have any questions regarding these comments or require further assistance on issues regarding fish and wildlife resources related to the proposed project, including federally listed threatened or endangered species, please contact the U.S. Fish and Wildlife Service at the aforementioned New Jersey address.

Thank you for the opportunity to provide these comments.

Sincerely,



Don Henne  
Regional Environmental Officer

22. Please refer to Response 3.

23. Please refer to Response 5.

24. Please refer to Responses 8, 9, 10, and 11.

25. Please refer to Response 12.

26. Please refer to Response 14.



**UNITED STATES DEPARTMENT OF COMMERCE**

**The Under Secretary for  
Oceans and Atmosphere**  
Washington, D.C. 20230

February 14, 1997

Mr. Robert L. Callegari  
Chief, Planning Division  
DOA, Philadelphia District, COE  
Wanamaker Bldg., 100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Mr. Callegari:

Enclosed are comments on the Draft Environmental Impact Statement for Delaware River Main Channel Deepening Project. We hope our comments will assist you. Thank you for giving us an opportunity to review this document.

Sincerely,

Donna S. Wieting  
Acting Director  
Ecology and Conservation Office

Enclosure

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

COMMENTS ON

DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

FOR

DELAWARE RIVER MAIN CHANNEL DEEPENING PROJECT

National Marine Fisheries Service (NMFS), NOAA has reviewed the subject DEIS. We offer the following comments for your consideration. Please contact Karen Greene at 908-872-3023 if you have questions regarding these comments.

1.1.5.1 Section 7 Consultation

This section states that the NMFS has not responded to the Philadelphia District's Biological Assessment of the impacts of dredging on endangered and threatened species. This is inaccurate. A Biological Opinion for all dredging projects permitted, funded or conducted by the Philadelphia District Corps was issued by the NMFS on November 26, 1996. Several copies of this document were sent to the Corps.

1.1.2.2 Sand Stockpiles and 3.3.3.3 Underwater Berm/Sand Stockpiles

We remain concerned about the impacts of sand stockpiling on the benthic resources of Delaware Bay. The negative impacts of this proposal are clear - approximately 730 acres of bay bottom and its associated benthic fauna would be suffocated. The SEIS has not adequately addressed the benefits of this proposal. As stated in our letter dated March 1, 1996, the ecological trade-offs associated with the loss of benthic fauna and the habitat modification must be weighed against potential benefits. What are the ecological benefits of this sand stockpiling?

In the future, if the sand stockpiles will be used for beach nourishment, why can't the sand be placed directly on the beach rather than in sand stockpiles? Both stockpile sites are located in shallow water (-8.0 feet MLW) within 0.5 miles of the shore. In fact, the Broadkill Beach sand stockpile area (LC-5) which covers 230 acres is located 0.33 miles offshore. The Slaughter Beach site (MS-19) covers 500 acres and is located 0.5 miles offshore. In addition, we understand that the State of Delaware would prefer to have the sand placed directly on the beaches. Consequently, an explanation of why the sand cannot be placed directly on the beaches in should be provided.

1. Concur. This section will be modified in the final SEIS.

2. Please refer to EPA Response 3. The ecological impacts of sand stockpiling mainly occur when the sand is placed on the beaches. The sand stockpiles have been positioned close to the shoreline so that Delaware will be able to reach the sand using their dredging equipment and place the material on the beach as needed. Once on the beach, the sand will provide habitat for horseshoe crabs and shorebirds.

3. The project economic benefit analysis indicated that the least cost option is to place the sand material at the selected sand stockpile sites for future beach nourishment. During the Plans and Specification phase, the economic viability of possible direct placement of sand on the beaches will be considered.

#### 3.3.3.2 Wetland Restorations

##### Kelly Island Wetland Restoration Design

Pages 3-40 to 3-51 of the SEIS describe the proposed wetland restoration plan for Kelly Island. Throughout the planning process for these beneficial use projects, we have stressed that any wetlands that are created or restored using dredged material must receive daily tidal inundation. In our past comment letters, we have expressed concerns about project designs which restrict tidal flow. The plan proposed in the SEIS appears to address sufficiently our concerns. However, at the interagency meeting held on February 7, 1997, the Corps proposed a new project design which would result in the creation of an impoundment at Kelly Island. This revised design was developed at a workshop to which NMFS was not invited. We cannot support the creation of an impoundment from shallow water habitat of Delaware Bay as a beneficial use of dredged material. While the reduction on the use of geotubes proposed in the revised plan could be considered a design improvement, the revised proposal presents little benefit to the resources under our jurisdiction.

Although information on the management of the proposed impoundment has not been provided for our review, we are extremely concerned that the creation of the impoundment will result in the loss of fishery habitat. As a result, we cannot endorse the creation of an impoundment at Kelly Island. We request that project plans be further redesigned to insure daily tidal inundation of the entire site.

#### 3.3.4.1 Monitoring

We request that copies of all monitoring reports be sent to the NMFS Habitat and Protected Resources Division's Sandy Hook, New Jersey and Oxford, Maryland field offices.

#### 3.3.4.2 Contingency Plan for Kelly Island

We request that copies of the contingency plan be sent to the NMFS Habitat and Protected Resources Division's Sandy Hook, New Jersey and Oxford, Maryland field offices for our review.

#### 3.3.4.3 Environmental Windows

Although the SEIS states that shortnose sturgeon uses the Delaware Bay, little information is available to confirm this statement. While anecdotal reports indicate that shortnose sturgeon may have been caught in the bay in the past, no studies have been done to assess their current use of the area. Without additional studies, developing an environmental window for shortnose sturgeon in the bay similar to the windows used in the Delaware River is not possible. This lack of data should be discussed in the final EIS.

4. Please refer to EPA Response 1. The redesign of Kelly Island is described in Section 3.3.3.2 of this final SEIS. As requested by the Delaware Department of Natural Resources (DNREC), this site will be contained by a sand berm with a geotextile tube core. It will have water control structures for post-construction wetland management and tidal flushing that allows for the exchange of fish and other aquatic organisms. Within the structure, a 60 acre tidal Spartina alterniflora marsh is expected to develop. The site will be managed by the DNREC. Properly constructed and managed impoundments in the Delaware Estuary do not adversely impact important fish species. Although fish diversity is slightly reduced within impoundments when compared to the open estuary, total diversity is increased several times. A significantly greater variety of plants, birds, mammals, and invertebrates can be supported in properly managed impoundments than in almost any other wetlands.

5. Concur.

6. Concur.

7. The final SEIS will acknowledge that there is little information about the use of the Delaware Bay by shortnose sturgeons.

8. This section of the SEIS does not discuss the use of the bay by threatened and endangered sea turtles. The use of the bay by these species is well documented, and a fairly well defined environmental window for the presence of these species in the area exists. In general, sea turtles can be found in the Delaware Bay from June through November. Observer reports from the Corps' maintenance dredging of the main channel support the existence of this environmental window for sea turtles. This information should be included in the final EIS.

9. Additional information on the presence of shortnose sturgeon and sea turtles in project area can be found in the Corps' biological assessment (Corps 1995) and the NMFS biological opinion (NMFS 1996) for dredging projects within the Philadelphia District. We suggest that these documents be reviewed and the appropriate information be incorporated into the final EIS.

#### 10.0 Endangered Species Concerns

10. Under Table 10-1, Sensitive Joint-Vetch and Bur-Marigold are listed as species under the jurisdiction of the NMFS. They are under the jurisdiction of the U.S. Fish and Wildlife Service.

#### 10.1.2.3, 10.4.2.4 and 10.5.2.3 Shortnose Sturgeon

11. On page 10-19, the seasonal restrictions prescribed by the Delaware Basin Fish and Wildlife Management Cooperative (Coop. 1992 and Coop. 1994) are discussed as a management practice to avoid impacting shortnose sturgeon during dredging in Delaware River. The Corps should also comply with the terms and conditions of the Incidental Take Statement in the district-wide Biological Opinion (NMFS 1996). Although the Cooperative's seasonal restrictions have been incorporated into the Biological Opinion, there are several additional requirements that must be followed in order to ensure compliance with the Endangered Species Act.

12. The Chester-Philadelphia "pollution zone" is discussed on page 10-29 of the SEIS as limiting shortnose sturgeon's use of the portion of the river in which the channel deepening will begin. Water quality in this section of the river has improved in recent years because of controls on non-point source pollution. As a result, the use of this area by shortnose sturgeon has increased. Although additional studies are needed to determine the extent to which shortnose sturgeon uses this area, the Corps should not assume that shortnose sturgeon use this only as a migratory route.

13. In addition section 10.4.2.4 of the SEIS states that studies conducted by Rutgers University did not identify any adult sturgeon mortalities as a result of dredging operation in the Delaware River between Philadelphia and Trenton. These studies were conducted in the mid-1980's. In March 1996, three sub-adult

8. Concur. This information will be added to the final SEIS.

-9. Concur.

10. Concur. This will be corrected in the final SEIS.

11. Concur. The discussion on the "Incidental Take Statement" will be included in the final SEIS, as well as any other applicable requirements of the Biological Opinion.

12. Concur. The final SEIS will include this information.

13. The final SEIS will be changed to include this information.

shortnose sturgeon were found in a dredged material disposal pool on Money Island, near the Newbold Island Range of the river. Both a hopper dredge and a cutterhead pipeline dredge were using the disposal site at the time the shortnose sturgeon were found.

#### 13.0 Assessment of Impacts Associated with Rock Blasting

14. Although the SEIS adequately addresses the potential impacts of rock blasting on most living marine resources, it should be noted that the Biological Opinion issued by NMFS for dredging in the Philadelphia District does not cover blasting. Based upon the location of the blasting in the Marcus Hook area, it is not likely that sea turtles and marine mammals will be in the project area. However, shortnose sturgeon may be found near Marcus Hook. While the seasonal restrictions prescribed by the Cooperative and included in our Biological Opinion are necessary to reduce impacts to anadromous fishes, we recommend that the Corps continue coordination with the NMFS to ensure compliance with the requirements of the Endangered Species Act.

15. We continue to recommend that the Corps place the sand dredged from the lower portions of the deepening project on the beaches rather than stockpiling the sand offshore. We look forward to continued coordination with the Corps to resolve this issue as well as any other remaining issues.

14. The Corps will continue to coordinate with NMFS, as necessary, to ensure compliance with requirements of the Endangered Species Act.

15. Please refer to Responses 2 and 3.

Literature Cited

National Marine Fisheries Service, Northeast Region. 1996.  
Endangered Species Act Section 7 Consultation: Biological Opinion  
for Dredging Activities within the Philadelphia District.  
November 26, 1996.

Delaware Basin Fish and Wildlife Management Cooperative. 1992.  
Draft policy: periods of for restricting or prohibiting dredging  
blasting and overboard disposal in the Delaware River Basin.

Delaware Basin Fish and Wildlife Management Cooperative. 1994.  
Letter to Frank Cianfrani, Chief of the Regulatory Branch, U.S.  
Army Corps of Engineers, Philadelphia district. January 6, 1994.

U.S. Army Corps of Engineers, Philadelphia District. 1995.  
Biological Assessment of the Impacts of Federally listed  
Threatened and Endangered Species of Sea Turtles, Whales and  
Shortnose Sturgeon within the Philadelphia District Boundaries:  
Impacts of Dredging Activities.



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL GEODETIC SERVICE  
National Geodetic Survey  
Silver Spring, Maryland 20910-3267

FEB 11 1997

MEMORANDUM FOR: Donna Wieting  
Acting Director, Ecology and Conservation  
Office  
FROM: *Charles A. Lapine*  
Captain Lewis A. Lapine, NOAA  
Director, National Geodetic Survey  
SUBJECT: DEIS-9701-01--Delaware River Main Channel  
Deepening Project

The subject statement has been reviewed within the areas of the National Geodetic Survey's (NGS) responsibility and expertise and in terms of the impact of the proposed actions on NGS activities and projects.

All available geodetic control information about horizontal and vertical geodetic control monuments in the subject area is contained on the NGS home page at the following Internet World Wide Web address: <http://www.ngs.noaa.gov>. After entering the NGS home page, please access the topic "Products and Services" and then access the menu item "Data Sheets." This menu item will allow you to directly access geodetic control monument information from the NGS data base for the subject area project. This information should be reviewed for identifying the location and designation of any geodetic control monuments that may be affected by the proposed project.

If there are any planned activities which will disturb or destroy these monuments, NGS requires not less than 90 days' notification in advance of such activities in order to plan for their relocation. NGS recommends that funding for this project includes the cost of any relocation(s) required.

For further information about these monuments, please contact John Spencer; SSMC3, NOAA, N/NGS; 1315 East West Highway; Silver Spring, Maryland 20910; telephone: 301-713-3169; fax: 301-713-4175.

The text of this Draft Environmental Impact Statement indicates that the proposed deepening of the Delaware River Channel from the Philadelphia/Camden waterfront to deep water in Delaware Bay

No National Geodetic Survey monuments will be impacted by this project. "As built" blueprints and hydrographic surveys will be provided to the National Ocean Service when the project is completed.



will affect the charted channel depth tabulations shown on National Ocean Service (NOS) Nautical Charts 12304, 12311, 12312, and 12313. The hydrography in the charted disposal sites along the course of the river may also be impacted. The text of U.S. Coast Pilot 3 referencing the Delaware River Channel may also require amendment.

NOS will require "as built" blueprints and hydrographic surveys from this U.S. Army Corps of Engineers project when completed so that changes can be accurately detailed on future editions of affected charts.

For further information about these charting activities, please contact Howard Danley, NOAA, NOS, Office of Coast Survey, N/CS28, 1315 East West Highway, Silver Spring, Maryland 10910.

Richard W. Blevins  
NOAA/NOS Office of Coast Survey  
Atlantic Hydrographic Branch  
439 West York Street  
Norfolk, VA 23510  
January 9, 1997

Department of the Army  
Philadelphia District, Corps of Engineers  
Environmental Resources Branch  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390

To Whom It May Concern:

As of June 11, 1993 this office no longer processed Corps of Engineers (COE) permits and public notices. Your office has been notified of this via mail and phone several times in an attempt to inform you of this change. Please remove from your mailing list the address shown on the COE mail I've return with this letter. The NOAA point of contact for this information is Sharon Tear. She can be reached at: 301-713-2737 Ext. 127. If you have any questions, contact me at: 804-441-6413. I will be more than happy to assist you.

Sincerely,

*Richard W. Blevins*  
Richard W. Blevins

1. Ms. Tear was contacted and she stated that she did not need to review the SEIS.



U. S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
REGION ONE

New Jersey Division Office  
840 Bear Tavern Road, Suite 310  
Trenton, New Jersey 08628-1019

January 2, 1997

IN REPLY REFER TO:  
HEC-NJ

Mr. Robert L. Callegari  
Chief, Planning Division  
Department of the Army  
Philadelphia District, Corps of Engineers  
100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390

Dear Mr. Callegari:

This letter is in response to your request for comment and review on the Delaware River Main Channel Deepening Project Draft Supplemental Environmental Impact Statement.

Based on the information presented, there appears to be no involvement with transportation facilities that would cause traffic delays or interruptions, or impacts on roadways, bridges, etc. Because there is no funding or federal approvals from the United States Department of Transportation (USDOT), Section 4(f) of the USDOT Act of 1966 does not apply.

We appreciate the opportunity to be a commenting agency on this project and look forward to continuing our work together. If you have any questions, please call Victoria Martinez (609) 637-4238.

Sincerely yours,

*Victoria Martinez for*  
Dennis L. Merida, P.E.  
Division Administrator

No response required.



United States	Forest	Northeastern Area	100 Matsonford Road
Department of	Service	State & Private	5 Radnor Corp Ctr, Ste 200
Agriculture		Forestry	Radnor, PA 19087-4585

File Code: 1950


Date: January 6, 1997

Mr. Robert L. Callegari  
Chief, Planning Division  
Department of the Army  
Philadelphia District, Corps of Engineers  
Wanamaker Building, 100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Mr. Callegari:

Thank you for inviting comment on the Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project. You have addressed the issue of impact to the four disposal sites from hazardous, toxic and radioactive waste in the dredged material. You have coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service in addressing the issue of impact to species listed under the Endangered Species Act, as well other species. I have no additional comments to offer.

Sincerely,

*for*   
MICHAEL T. RAINS  
Area Director

No response required.



United States  
Department of  
Agriculture

Natural Resources  
Conservation  
Service

Suite 101  
1203 College Park Drive  
Dover, Delaware 19904-8713

January 22, 1997

Robert L. Callegari  
Chief, Planning Division  
Environmental Resources Branch  
U.S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Mr. Callegari:

In response to your letter dated December 20, 1996, the Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project has been reviewed by NRCS state conservation engineer, Ronald Gronwald. Attached is a copy of his report.

Sincerely,

ELESA K. COTTRELL  
State Conservationist

Attachment

No response required.



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

NOW: Natural Resources  
Conservation  
Service

Suite 101  
1203 College Park Drive  
Dover, DE 19904-8713

Subject: ENG - Review of Report on the Proposed  
C.O.E. Delaware River Main  
Channel Deepening Project

Date: January 14, 1997

To: File code

Elesa K. Cottrell  
State Conservationist  
USDA, NRCS  
Dover, Delaware

210

As requested, I have reviewed the subject report. The Corp of Engineers proposes to deepen the main shipping channel of the Delaware River from Philadelphia, PA to the Atlantic Ocean from its presently maintained depth of 40 feet to a depth of 45 feet. The purpose of this deepening is to allow larger, more efficient ships to use the river for commerce. Presently, large oil tankers unload part of their cargo (lightering) into barges off of Big Stone Beach, before proceeding upstream. The non-federal sponsor who will cost-share this project is the Delaware River Port Authority.

The major impact of this project to Delaware will be the disposal of the dredged material resulting from this project. Since the material dredged will be mostly previously undisturbed river bottom, exposure of toxic material is not expected to be a problem. The Corp is proposing to place 9.5 million cubic yards of dredge spoil (out of a total of 33 million cubic yards) in Delaware as follows:

- 1.) One million cubic yards of dredged material would be placed in each of two active federal dredged material disposal sites located north and south of the east terminus of the Chesapeake and Delaware Canal. No new upland disposal sites are proposed within the State of Delaware.
- 2.) 1.8 million cubic yards of dredged material will be utilized in a 90 acre wetland restoration at the Kelly Island site just north of Port Mahon. This site is at the mouth of the Mahon River and will restore wetlands which have recently been destroyed by erosion. The Corp proposes to use sand filled geotextile tubes to form a wave barrier and containment structure. Dredged material would be used to raise the ground level within the containment to approximately high tide elevation to restore the tidal marsh.
- 3.) Two areas in Delaware Bay offshore of Delaware have been selected to receive an underwater berm for the purpose of stockpiling sand for future beach replenishment. The Broadkill Beach site is 0.3 miles offshore. The existing bottom elevation is -8.0 feet (8 feet

No response required.

below mean low tide). It is proposed to stockpile 1.9 million cubic yards of sand by constructing a berm to an elevation of -3.0 feet. The Slaughter Beach site is 0.5 miles offshore and will receive 2.8 million cubic yards of sand by building a berm from elevation -8.0 feet to an elevation of -3.0 feet.

From this report, I can see no impact on agriculture in Delaware as a result of this project. I do not see any concerns from an engineering standpoint regarding the spoil disposal activities proposed within Delaware.



RONALD F. GRONWALD  
State Conservation Engineer

No response required.



State of New Jersey

Christine Todd Whitman  
Governor

Department of Environmental Protection

Robert C. Shinn, Jr.  
Commissioner

February 17, 1997

Robert L. Callergari  
Chief, Planning Division  
U.S. Army Engineer District, Philadelphia  
100 Penn Square East  
Philadelphia, PA 19107-3390

RE: Delaware River Comprehensive Navigation Study  
Main Channel Deepening Project

Dear Mr. Callergari:

The Office of Program Coordination of the New Jersey Department of Environmental Protection has completed its review of the Draft Supplemental Environmental Impact Statement (SEIS; January 1997) prepared for the above referenced project. This review was conducted pursuant to the requirements of the National Environmental Policy Act. The SEIS has been prepared by the U.S. Army Corps of Engineers (USACE) to "provide additional information and environmental analysis to address environmental concerns raised during review of the 1992 Feasibility Report and Environmental Impact Statement".

The Department has previously provided the USACE with comments on the proposed project. In a May 29, 1992 letter from Lawrence Schmidt, the Department identified significant concerns with the project, including:

(a) potential impacts to water quality and the USACE seeking a Clean Water Act Section 404(r) exemption from state issued Water Quality Certifications;

(b) sediment contamination issues and associated adverse environmental impacts;

(c) potential impacts of the channel deepening on salinity and current patterns in the Delaware estuary;

(d) disposal/beneficial use options in Delaware Bay; and,

(e) potential impacts to Endangered/Threatened species.

In a July 1, 1996 letter from Lawrence Schmidt reviewing preliminary draft sections of the Draft SEIS, concerns were noted with respect to the methods used by the USACE to evaluate the bulk sediment chemistry and elutriate data collected for the project. The use of additional analyses and evaluation procedures was requested. In addition, the USACE had previously been provided



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with a copy of the Department's guidance manual "The Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters" (Draft - March 1996). It was stated that the Department would use this guidance document in its regulatory and National Environmental Policy Act reviews to evaluate the potential environmental impacts of the proposed project.

Although the Draft SEIS addresses some of the concerns previously raised by the Department, a number of issues have not been adequately addressed, and additional analyses are needed to evaluate the potential environmental impacts of the proposed project.

#### Sediment Quality Evaluations (Chapter 4)

The Main Channel Deepening project has been divided into five reaches: Reaches A through D are within the Delaware River, and Reach E is within Delaware Bay. It is proposed that sediments dredged from Reaches A through D will be disposed of in nine "active" federal upland confined disposal facilities (CDFs) and four "new" upland CDFs. Dredged material from Reach E would be used for a variety of beneficial use projects. In general, the sediment quality evaluations discussed in the Draft SEIS are not consistent with the Department's draft dredging guidance manual.

A series of sediment cores were collected within each project Reach (see Plates 5 and 6). The bulk sediment chemistry data for the cores were grouped by Reach, and the mean value of each parameter calculated. These mean values were then compared with various NJDEP soil cleanup criteria to evaluate the potential impacts to human health associated with the disposal of the dredged material in upland CDFs or its beneficial use.

A review of the data for heavy metals in Tables 4-2 and 4-9 shows that, although the mean values for the following parameters for the indicated Reaches do not exceed the NJDEP Residential Direct Contact Soil Cleanup Criteria, a number of individual sample values (as indicated by the range of detected values) do exceed these criteria:

Antimony, Lead: Reaches A, B, C, D

Arsenic: Reaches A, C

Beryllium: Reaches B, C, D

Cadmium, Selenium: Reaches A, B, C, D, E

Thallium: Reaches B, D

2.

1. The referenced guidance manual was released in draft form in March of 1996. The Preconstruction, Engineering and Design Study that led to preparation of the Draft Supplemental Environmental Impact Statement (DSEIS) was completed in May of 1996. As such, all sediment quality analyses presented in the DSEIS were completed prior to availability of the draft manual. The Philadelphia District coordinated all of the sediment quality data presented in the SEIS with the New Jersey Department of Environmental Protection (NJDEP) as it was collected. This data base was developed over a period of approximately five years. The NJDEP has never commented that the data was unacceptable or did not comply with State requirements.

2. The NJDEP draft guidance manual does not discuss how to evaluate bulk sediment data to determine the potential for environmental impacts as a result of dredging operations. The presentation in the DSEIS was developed by the Philadelphia District to facilitate a review by NJDEP personnel, because previous submission of the complete data set resulted in no review at all. Based on the complete set of bulk sediment quality data, the following number of individual samples had actual concentrations that exceeded the NJDEP Residential Direct Contact Soil Cleanup Criteria for the parameters listed:

Parameter	Reach A	Reach B	Reach C	Reach D	Reach E
Antimony	1 of 33	15 of 49	9 of 29	6 of 19	0 of 23
Lead	1 of 33	1 of 49	1 of 29	1 of 19	0 of 23
Arsenic	1 of 33	0 of 49	2 of 29	0 of 19	0 of 23
Beryllium	0 of 33	8 of 49	4 of 29	4 of 19	0 of 23
Cadmium	10 of 33	9 of 49	6 of 29	4 of 19	3 of 23
Selenium	8 of 33	6 of 49	4 of 29	1 of 19	1 of 23
Thallium	0 of 33	4 of 49	0 of 29	2 of 19	0 of 23
Benzo a Pyrene	0 of 33	1 of 49	0 of 29	0 of 19	0 of 23
Benzo b fluoranthene	0 of 33	1 of 49	0 of 29	0 of 19	0 of 23

As can be seen from the above presentation, less than 10 percent of the samples had concentrations that exceeded the NJDEP Residential Standards for the parameters lead, arsenic, benzo (a) pyrene, and benzo(b) fluoranthene. Likewise, less than 10 percent of Reach A samples for antimony and samples from Reaches D and E for selenium had concentrations that exceeded these standards. A more in-depth statistical analysis of the complete data sets for these parameters and Reaches would not provide any additional information that would be of value to the evaluation. There are not enough detections above the Residential Standards to suggest that the true means could possibly be above the Residential Standards. The compliance requirements for achieving these standards include that "No more than 10 percent of the soil samples, or one sample if two to 10 samples, inclusively, are used, exceed the applicable soil cleanup standard." (Site Remediation Program Cleanup Standards for Contaminated Sites Proposed New Rules: N.J.A.C. 7:26D from the New Jersey Register, Monday, February 3, 1992). As such, use of 10 percent seems appropriate.

With regard to cadmium, members of the New Jersey Department of Environmental Protection Dredging Task Force have indicated to Philadelphia District personnel that the Residential Standard for cadmium is being raised from 1 ppm to 37 ppm. The highest concentration of cadmium in 153 sediment samples collected from the Delaware River navigation channel was 5.24 ppm. Therefore, additional analysis of cadmium data is unwarranted, as concentrations are well below this higher Residential Standard.

The parameters antimony, beryllium, selenium and thallium did have sample concentrations greater than the Residential Standards in more than 10 percent of the samples for the Reaches identified in the NJDEP letter. Material dredged from these Reaches would be thoroughly mixed during the dredging operation, so it is believed that any areas with higher concentrations would be diluted to provide a mean concentration in the disposal area that is below the Residential Standards. Maximum concentrations of antimony and selenium are an order of magnitude below the NJDEP Non-Residential Standards. Even if there were pockets of material that approached these maximum concentrations, it is inconceivable to think this could represent a health concern because people would not come in contact with the material on a frequency that even approaches the assumptions that were used to develop the standards. As discussed in the DSEIS, the elevated thallium concentrations are believed to be the result of laboratory process during the first round of sampling. Two subsequent rounds of sampling failed to reproduce the initial data, with all samples being well below the Residential Standards. Maximum concentrations of beryllium were 1.5 ppm, which is only slightly above the Residential and Non-Residential Standards of 1.0 ppm. These slightly elevated levels would easily be diluted during the dredging operation. It is unlikely that any additional statistical analysis of the data, or physical analysis of the proposed dredging would provide any information that would be of use to this evaluation.

Likewise, the PAH data (Tables 4-5 and 4-14) show that individual samples from Reach B slightly exceed the Residential Direct Contact Soil Cleanup Criteria for Benzo(a)pyrene and Benzo(b)fluoranthene.

The use of mean Reach values to evaluate sediment contamination issues is not inappropriate, as long as these mean values are representative of the actual parameter concentrations present in the sediments to be dredged. The information provided in the Draft SEIS is not sufficient to enable the Department to evaluate the appropriateness of using mean Reach values. In addition, all of the sediments from a particular Reach will not be placed in one upland CDF - the dredged material from various "sub-Reaches" will be directed to specific upland CDFs (see Plates 24 and 25). The presence of contaminated sediment "hot-spots" in various Reaches of the project area may further complicate the Department's evaluation of dredged material disposal in a particular upland CDF or a proposed beneficial use. Additional analyses are needed, as described below; these analyses were previously requested in the Department's July 1, 1996 letter

The USACE must develop an appendix which includes all of the grain size, Total Organic Carbon, heavy metal, and PAH bulk sediment chemistry data for each sediment sample for the parameter/Reach combinations noted above. This should consist of a series of data tables for each Reach, and include a statistical analysis of the distribution of the data for each parameter within each Reach (i.e. mean, range, standard deviation, etc.). The sampling location and depth, and the estimated volume of sediment to be dredged associated with each sample, should also be clearly identified. The USACE should also complete an evaluation of worst case sediment concentrations (i.e. the highest parameter values recorded) for each parameter/sub-Reach combination, analogous to that completed for the mean Reach values in the Draft SEIS, specific to each upland CDF or proposed beneficial use designated for that sub-Reach.

A series of sediment cores were collected from each Reach and subject to elutriate analyses; these samples were separate from those collected for the bulk sediment chemistry analyses (see Plates 7 and 8). This data was then used "to predict contaminant levels that would be liberated from sediment during dredging and disposal activities [emphasis added]" (Section 4.2, page 4-36). It was "concluded that dredging and dredged material disposal operations would not significantly impact water quality within the Delaware River" (Section 4.2, page 4-39).

The elutriate test can be used to predict potential water quality impacts of the dredging operation. However, when the dredged material is to be placed in an upland CDF - as proposed for Reaches A through D - the modified elutriate test must be used to simulate and evaluate potential impacts to surface water quality resulting from dewatering effluent discharges. Thus, given the information provided in this chapter of the Draft SEIS, the Department cannot, at this time, agree with the conclusion of the document that "disposal operations would not significantly impact water quality". This concern is discussed in more detail in Upland CDFs - Discharges to Surface Water.

Section 4.3 (page 4-42) discusses Toxicity Characteristic Leaching Procedure (TCLP) analyses of twenty sediment samples. It is stated that "the TCLP test simulates pH changes that

3. A series of sediment cores collected in 1992 were evaluated using the modified elutriate test. The report of this analysis has been previously provided to the New Jersey Department of Environmental Protection. Data pertaining to the predicted dissolved concentrations of contaminants in effluent discharged from an upland dredged material disposal site were presented in the draft SEIS because this fraction is most available to aquatic biota, and it was the most comprehensive data set. In addition to the predictive elutriate analyses, water column bioassays of channel sediments were also run too directly assess any potential effects of the release of effluent from upland sites on aquatic biota. In 38 separate tests, 100 percent survival was recorded for all species in the undiluted sediment elutriate. These tests subjected aquatic organisms to more extreme conditions than would be encountered during operation of a dredged material disposal site because there was no mixing of the simulated effluent with river water, which would dilute contaminant concentrations. Based on the data collected to date, there is no reason to believe that dredged material disposal operations would

4. The New Jersey Department of Environmental Protection has repeatedly requested TCLP data from the Philadelphia District to facilitate review of potential impacts associated with dredging the Delaware River navigation channel. NJDEP personnel indicated that this was what the Department used to evaluate potential groundwater impacts. While the Philadelphia District did not agree that TCLP data was useful to the evaluation of dredged material, the data was collected and provided to NJDEP.

sediments may experience when exposed to air and acidic rain in an upland disposal area, [so the] data can also be used to evaluate potential groundwater and surface water impacts". This is an incorrect characterization of the applicability of the TCLP, and it should not be used to evaluate potential impacts to groundwater or surface waters resulting from the placement of dredged material in an upland CDF. Concerns regarding Potential impacts to these environmental features are discussed in more detail in Upland CDFs - Discharges to Surface Water and Upland CDFs - Discharges to Groundwater, and in the Department's draft dredging guidance manual.

Sections 4.4.1 (page 4-44) and 4.4.2 (page 4-47) discuss bioassay and bioaccumulation analyses of various sediment samples. The sediments used for these tests were collected using grab samples - not cores - and thus are not representative of the entire volume of sediments to be dredged. Thus, the Department cannot agree with the conclusions of the Draft SEIS - based on the results of these tests - regarding potential impacts to estuarine biota resulting from the open water placement of the dredged material. Note, however, that if the Reach E sediments proposed to be used in the wetland restoration project at Egg Island Point are greater than 90% sand, the Department will consider these sediments suitable for the proposed beneficial use, without additional testing.

Finally, given that construction of the proposed Main Channel Deepening project is anticipated not begin until the Year 2000, and will take four years to complete (Section 3.1.2.4, page 3-5), the sediment quality data presented in the Draft SEIS - collected in the early-1990's - may not be representative of the actual sediments to be dredged. In addition, maintenance dredging of the project area will continue at least until the Year 2050. The USACE should thus commit to the collection of additional sediment quality data just prior to the initiation of construction (i.e. no later than six months), in order to verify project conditions are reasonably consistent with those evaluated in the Draft SEIS. Likewise, a program of data collection for maintenance dredging operations to the Year 2050 is also needed. The USACE should coordinate the development and implementation of these data collection programs with the Department's Dredging Task Force.

#### Hazardous Waste Investigations at the Upland CDFs

Section 6.1 of the Draft SEIS reports on the results of sampling and testing the existing soils at the "new" upland CDF sites. A sample from Site 17G exceeded the Toxic Characteristic Leaching Procedure (TCLP) level for lead. In addition, samples exceeded the NJDEP Non-Residential Soil Cleanup Criteria for benzo(a)pyrene at Site 17G, and arsenic at Site 15G.

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5. It was determined that grab samples would be sufficient since bulk sediment testing did not show that subsurface sediments contained higher levels of contaminants relative to the surface. The biological testing was conducted primarily at the request of the U S Environmental Protection Agency and the State of Delaware. The concerns of these agencies have been addressed by this testing. With regard to beneficial use of dredged material at Egg Island Point, the material would be greater than 90 percent sand. As such, the method of sample collection should not be an issue.

6. The Philadelphia District has conducted bulk sediment analyses in three separate years and has not identified any significant levels of contamination in project sediments. It is unlikely that this condition will change in the short-term without a significant event such as a large chemical spill. The District will periodically collect additional data to monitor sediment quality. The frequency of this monitoring has been discussed with the NJDEP Dredging Task Force. Additional coordination will continue in the future.

7. Additional testing will be performed as part of the next phase, Plans and Specifications, around the areas of concern. Specifically, soil in the vicinity of samples HTRW 7,10, and 13 will be tested. Any contaminated soil will be removed prior to construction.

An exceedance of the TCLP criterion for lead is indicative of a hazardous waste. Subsequent statements in the Draft SEIS that characterize this finding as only a "minimal exceedance" requiring "no additional testing or remediation" are misleading. If these soils are left in place, at a minimum a Declaration of Environmental Restriction (DER) will be required to identify the location of the contamination. If the volume of contaminated soil is limited, excavation and removal would be a preferable option from an environmental perspective. However, the exact disposition of this situation would require additional evaluation of the available data prior to a determination of the best course of action.

Note that DERs may also be required due to the above noted exceedances for arsenic and benzo(a)pyrene if the contaminated soils are left in place.

#### Upland CDFs - Discharges to Surface Water

In general, the Draft SEIS does not evaluate or discuss potential impacts to surface water quality resulting from dewatering effluent discharges from the proposed upland CDFs and appears to assume any such impacts will be minimal. The level of consideration given to these potential impacts appears to be summarized in the statement (page 4-32) that since "[i]n Reaches A through D, material would be removed from the aquatic environment and placed in confined, upland sites ... any adverse impacts to aquatic resources would be precluded." The Department has previously noted the need for additional evaluation and discussion of the dewatering effluent discharges from the upland CDFs (see the May 29, 1992 and July 1, 1996 letters from Lawrence Schmidt). As noted above, the sediment quality evaluations completed to date cannot be used for this purpose.

Control and monitoring of discharges from the upland CDFs were briefly discussed in the February 1992 Final EIS, but were limited to discussions of suspended solids loadings. Although other potential impacts to water quality were acknowledged (decreased dissolved oxygen levels, increased levels of chemical contaminants), they were assumed to be insignificant. Based on the Draft SEIS, the Department cannot conclude that these discharges will be in compliance with federal and State Surface Water Quality Standards and will not result in significant adverse impacts to surface water quality. The Draft SEIS must acknowledge the importance of minimizing the dispersal of contaminants associated with sediment particles. It also must acknowledge the need to control and monitor the dewatering effluent discharges from the upland CDFs in order to avoid exceedances of narrative and numerical surface water quality standards. The physical and biological effects of turbidity must be discussed separately from the chemical and biological effects of contaminants associated with the dredged material. Detailed plans for the control and monitoring of the discharges to surface waters from all upland CDFs are needed.

Four "new" upland CDFs - Raccoon Island, Site 15D, Site 15G, and Site 17G' - are proposed for use in the main Channel Deepening project. Plates 20 through 23 show the proposed discharge locations of the outfalls from these upland CDFs:

8. The referenced statement on page 4-32 has been taken out of context. The statement refers to the comparison of bulk sediment data to the ERLs and ERMs developed by Long et al. (1995). These criteria reflect the potential for adverse effects on aquatic life due to exposure to sediment contaminants. The statement indicates that in Reaches A through D sediment would be taken out of the aquatic environment, and therefore these criteria are not directly applicable. The level of contaminants in effluent discharged from a confined dredged material disposal area is much less than what is contained in the sediments. The use of bulk sediment data to reflect effluent concentrations of contaminants is misleading.

9. The DSEIS is intended to supplement the EIS prepared in 1992, as such an attempt was made to minimize repetition of information. While statements regarding the importance of minimizing suspended sediments in effluent discharged from disposal sites and the need to control effluent discharges were not included in the DSEIS, the Philadelphia District has always operated sites in a manner that does minimize the release of suspended sediments. This information will be included in the Final SEIS along with a discussion of the physical and biological effects that can result.

10. The nine active upland CDFs are permitted by water quality certificates as operation of those sites is currently regulated by the State of New Jersey. The amount of effluent from the active sites will not significantly increase our current practice. The increase in effluent is within the variations in

- Raccoon Island and Site 15D will discharge to Raccoon Creek
- Site 15G will discharge to Oldmans Creek
- Site 17G will discharge to an unnamed tributary of the Delaware River.

The discharge locations of the other nine, currently "active" upland CDFs have not been identified in the Draft SEIS. Potential impacts to the surface water quality of these creeks resulting from the upland CDF dewatering effluent discharges have not been discussed in the Draft SEIS. The document also does not discuss the potential cumulative impacts resulting from two upland CDFs discharging to Raccoon Creek. Finally, the Draft SEIS does not discuss potential surface water quality impacts resulting from presumably increasing dewatering effluent discharges from the nine "existing" upland CDFs due to the Main Channel Deepening project and associated future increased maintenance dredging activities.

Section 6.3.3 (page 6-18) of the Draft SEIS discusses the habitat value of the four "new" upland CDFs and adjacent areas (similar discussions of the nine "existing" upland CDFs are not included in the Draft SEIS). The marshes of Raccoon Creek and Oldmans Creek have been designated by the U.S. Fish and Wildlife Service (USFWS) as focus areas for needed protection under the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan. These wetlands complexes have also been designated by the USFWS as priority wetlands under the Emergency Wetlands Resources Act, and by the U.S. Environmental Protection Agency (USEPA) as a priority wetlands under the Clean Water Act. In general, the wetlands associated with the surface waters into which the dewatering effluent from the upland CDFs will discharge have been described as having "exceptional value to fish and wildlife resources". The Draft SEIS does not discuss potential impacts to these wetlands resulting from the upland CDF dewatering effluent discharges.

The Draft SEIS also includes an analysis of the mean Reach bulk sediment chemistry data compared with the ERL/ERM criteria of Long et al. (1995) to evaluate the potential adverse impacts to estuarine biota in the project area (see Tables 4-20 and 4-21). Use of the Long et al. (1995) criteria is of some limited use in evaluating potential impacts to estuarine biota resulting from dewatering effluent discharges from the upland CDFs. A number of ERL were exceeded by the mean Reach values:

- Arsenic - Reaches C, D
- Cadmium - Reach A
- Mercury - Reaches A, B, C, D

However, an analysis of the individual sample data (as indicated by the range of detections reported in Table 4-2), show numerous exceedances of the ERL as follows:

- Arsenic, Lead, Silver - Reaches A, B, C, D

11. Based on bulk and elutriate sediment analyses, and water column bioassays, there is no reason to believe that the operation of dredged material disposal sites in the vicinity of Raccoon Creek, Oldmans Creek and their associated wetlands would have any adverse effect on fish and wildlife resources that utilize these areas. The sediments in these wetland areas most likely have contaminant concentrations that are at similar levels, if not higher, than what is found in channel sediments.

12. As previously stated, the use of ERLs and ERMs developed by Long et al. (1995) to evaluate potential impacts to aquatic resources from the discharge of effluent from confined disposal areas is misleading. These criteria were primarily included in the SEIS to evaluate potential impacts of placing material dredged from Delaware Bay in aquatic areas for beneficial use. In these areas aquatic organisms would come in contact with the dredged sediment, which could result in biological impacts if contaminant levels were high enough. In up-river areas, where material would be removed from the aquatic environment, these criteria are of limited value. It is unreasonable to equate bulk sediment concentrations to concentrations that would be expected from effluent discharges. Again, standard Philadelphia District procedures for operating dredged material disposal sites include control of weir structures to minimize release of suspended sediments.

- Cadmium, Nickel - Reaches A, B, C, D, E
- Chromium - Reaches A, C
- Copper - Reaches A, B, C
- Mercury - Reaches A, B
- Zinc - Reaches B, D

In addition, individual samples exceeded the ERM for Mercury in Reach C, and Zinc in Reaches A and C. This suggests that, unless the dewatering effluent discharges are controlled appropriately, potential adverse impacts to estuarine biota could occur.

Finally, the Department notes that the Draft SEIS states that the USACE has received a Clean Water Act Section 404(r) exemption from State issued Water Quality Certifications. The scope of applicability of this exemption relative to the proposed Main Channel Deepening project and other regulatory programs is not discussed in the Draft SEIS. Please provide this Office a copy of the Congressional legislative language authorizing this exemption.

#### Upland CDFs - Discharges to Groundwater (Chapter 7)

In general, the evaluations of potential impacts to groundwater resulting from the use of the thirteen upland CDFs proposed in the Draft SEIS are not consistent with New Jersey's Ground Water Quality Standards (N.J.A.C. 7:9-6) and the New Jersey Pollutant Discharge Elimination System (NJPDES) regulations (N.J.A.C. 7:14A). Although the Draft SEIS includes a summary of an evaluation of potential immediate and long-term impacts to the potable water supplies of the Potomac-Raritan-Magothy (PRM) formation completed by the U.S. Geological Survey (USGS), potability is not the sole focal point of the New Jersey Ground Water Quality Standards (GWQS); additional groundwater resources are of interest in the project area. The GWQS classifies ground waters as a function of their resource values, which include ecological significance, surface water recharge, recreational use, as well as potability. Consequently, the GWQS require that individual classifications of groundwater be protected for their total resource value. In the project area, not only is degradation of the PRM formation an issue of concern, but surficial ground water units of Quaternary and Tertiary age that overlie the outcrop of the PRM formation (including the Pennsauken and Cape May hydrologic units) and which may recharge surface water tributaries along the Delaware River, are also of concern.

The Draft SEIS evaluated potential impacts to ground water resources by comparison of bulk sediment chemistry data with the Soil Cleanup Criteria in the Department's draft, Cleanup Standards for Contaminated Sites (N.J.A.C. 7:26D). Notwithstanding the technical limitations associated with applying the Impact to Ground Water Soil Cleanup Criteria to these activities

13. 404(r) Exemption: The Clean Water Act (33 USC 466 et seq.), Section 404 (r) states, in part: "The discharge of dredged or fill material as part of the construction of a Federal project specifically authorized by Congress, whether prior to or on or after the date of enactment of this sub-section, is not prohibited by or otherwise subject to regulation under this section, or a State program approved under this section..". This project was approved by Congress by Public Law 102-580 and therefore, this section applies. This was confirmed by the letter from EPA commenting on the DSEIS, dated March 17, 1997. Portions of the Clean Water Act describing this section have been provided to the NJDEP. A discussion of the Clean Water Act Section 404(r) exemption will be included in the Final SEIS.

14. The District has demonstrated a proactive approach to groundwater monitoring at existing dredged material disposal areas. The District has performed several groundwater investigations at existing disposal sites in New Jersey and has concluded that disposal operations have a negligible impact on the groundwater regime in the immediate vicinity. Monitoring is continuing at National Park disposal area, National Park, New Jersey. Results of these investigations have been presented to the NJDEP Dredging Task Force, and to Mr. Roe on several occasions.

15. The District was attempting to make a comprehensive analysis of the sediment data using all of the criteria provided by the New Jersey Department of Environmental Protection. We were unaware that the Department did not use the Impact to Ground Water Soil Cleanup Criteria for this type of analysis. As stated above, additional groundwater analyses have been conducted for existing dredged material disposal areas. These analyses were well received by the New Jersey Dredging Task Force.

(including the lack of values for heavy metals), the Department has never used the soil cleanup criteria for permit-decision making associated with the NJPDES regulations.

The Draft SEIS concludes that local and regional impacts to ground water associated with the use of the proposed thirteen upland CDFs will be negligible. This conclusion was based on the results of the USGS study showing minimal risk to potable water supplies in the PRM formation, minimal contamination of the sediments to be dredged (based on mean Reach bulk sediment chemistry data), and the presence of 20-40 feet of fine-grained dredged material already in place at the upland CDF sites inhibiting migration of any contaminants which would be leached from the dredged material from the Main Channel Deepening project. Notwithstanding the limitations of the applicability of these factors/assumptions, they only represent issues of consideration in the NJPDES-Discharge to Ground Water permitting process, and are not criteria or a basis for exemption from compliance with the provisions of the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A) or the NJPDES regulations. Because the upland disposal of dredged material represents a potential discharge of pollutants, it is subject to regulation pursuant to the NJPDES regulations and the GWQS. For additional information on complying with these regulations, refer to the Department's dredging guidance manual (Draft - March 1996) and contact John Roe of the Bureau of Nonpoint Pollution Control at (609) 292-0407.

#### Upland CDFs - Operation and Management

Section 3.2.3.1 (page 3-11) of the Draft EIS notes that "[o]ne of the primary goal[s] and objectives for the four new [upland CDFs] is development, enhancement, and management of wildlife habitat in between dredged material disposal events". In general, this goal is supported by the Department. However, the Department does have concerns about the dispersal of contaminants associated with the dredged material into terrestrial and aquatic food webs via biota which use or colonize the upland CDFs. Also, the Draft SEIS does not discuss potential operational and final habitat uses of the nine currently "active" federal upland CDFs.

It appears that, to the greatest extent possible, one cell within each "new" upland CDF will be maintained in a ponded condition (with 1.5 to 3 feet of standing water) between dredged material disposal "cycles" to provide open water and freshwater emergent habitat (Section 3.2.3.3, page 3-14). This management technique will also minimize recolonization of the upland CDFs by *Phragmites*.

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16. The US Army Corps of Engineers is subject to permits required by Federal law. It is Corps policy to restrict permit acquisition to those that are required by Federal law. The NJDEPS-Discharge to Ground Water permit is a State of New Jersey permit. As such, the Corps is not able to apply for this permit. Based on the information presented above, the Corps believes it has provided state-of-the-art modelling to evaluate potential impacts to groundwater as a result of operating dredged material disposal sites along the Delaware River. This information is considered sufficient to address groundwater concerns.

17. The sediment data was evaluated by WES (See Section 10.4.1.3), as well as the U S EPA and U S FWS. They did not believe that the level of contaminants in the dredged material indicated that there was a concern over dispersal of contaminants into either the aquatic or terrestrial food webs.

The dredged material disposal sites are projected to be used for a period of 50 years. Final closure plans prepared at this time would most likely be out dated at the end of this project.

18. Comment noted. No response required.



19.

As noted above in Sediment Quality Evaluations, the Department has some concerns about sediments within the project Reaches that may be contaminated at relatively higher levels. It should not be assumed that all of the dredged material from a project Reach will be thoroughly mixed when placed in an upland CDF, and can thus be fully characterized by using mean Reach bulk sediment chemistry values. Further, Plates 24 and 25 show that dredged material from specific portions of each Reach will be disposed of in particular upland CDFs; this operational practice places into further question the validity of using mean Reach values to evaluate potential adverse environmental impacts resulting from sediment contamination. Management of the upland CDFs for habitat purposes should consider these concerns. In order to minimize potential exposure of aquatic and terrestrial biota to contaminated sediments, it may be appropriate to place "more contaminated" sediments into the upland CDFs first, so they are then covered by "less contaminated" dredged material, providing a kind of *de facto* cap. Use of such an operational procedure may also serve to minimize the potential discharge of contaminants to surface and ground waters.

The Department's Office of Mosquito Control expects that the proposed project will compound current mosquito control problems associated with maintenance dredging operations and the presence of standing water at the existing upland CDFs, which create mosquito breeding habitat. Upland CDFs create a two-phased problem:

- During active dredging and disposal operations, which is of primary concern;
- When the upland CDF is "dormant", the site becomes mosquito breeding habitat following storm events.

20.

Thus, control of mosquitoes at the upland CDFs requires a two-fold approach. During active operations, breeding surveillance and pesticide applications may be necessary. "Dormant" upland CDFs need to be physically managed to enhance their environmental condition, making them unsuitable for mosquito production. These management requirements must be coordinated with the habitat development plans discussed above to ensure that the multiple objectives for the upland CDF sites can be achieved.

The 1992 Final Environmental Impact Statement noted that dikes at some of the existing upland CDFs must be raised to provide sufficient capacity for the 50-year life of the project. However, Section 11.3.6 (page 11-20) states that no new construction will be needed at these sites. This should be clarified, and if dike raising is needed, the possible environmental impacts of raising the heights of these dikes should be evaluated; also see Upland CDFs - Capacity Issues. In addition, Section 3.2.3.1 (page 3-11) states that at the four "new" upland CDFs, after dewatering, dredged material from the Main Channel Deepening project will be used to "upgrade" the dikes at these sites. Note that the Department currently requires that any material to be used for dike construction at an upland CDF meet the Interim Residential Direct, Contact Soil Cleanup Criteria. It is not clear from the data provided in the Draft SEIS that the dredged material placed in the upland CDFs (or currently present in the nine "active" facilities) will meet

21.

19. The proposed cap practice is not practicable for dredged material disposal in these areas. It would be cost prohibitive to dredge the river in this fashion. In addition, the large areas of these disposal areas and hydraulic dispersement of material would preclude effective capping techniques.

20. The traditional methods to control mosquitos is to drain the area where they are breeding or to spray pesticides. Both of these methods are contrary to the goals of maintaining wetlands on portions of the CDFs between disposal cycles. A biological control was recommended by the FWS using small fish to eat mosquito larvae. The appropriate fish species will be selected in coordination with

21. The proposed new and existing disposal areas, for the deepening project will provided 50 years of capacity for dredging the river. No new construction will be needed at these sites, however, dikes will be raised in the future to provide additional capacity for the maintenance dredging.

Dredged material from within the sites is utilized presently to raise dikes, and will continue to be used in the future. If there is a NJDEP policy that requires testing of material that is rehandled on-site for dike building, this has not been officially conveyed to the District. Corps dredging policy requires only Water Quality Certification to operate the disposal areas pursuant to Section 401 of the Clean Water Act.

Additional sites would be needed for the existing 40 foot project, as stated. The new sites provide capacity for the 45 foot project. With additional dike raising at the new sites there is enough capacity for the 45 foot project for the next 50 years. This includes capacity at both the new sites and the existing sites.

this requirement. Thus, additional testing of the dredged material to be used for dike construction will be required by the Department.

A summary of the operational plans for the Raccoon Island upland CDF is presented on page 3-19. The Raccoon Island area currently provides shoreline fishing access and has great potential for development as a boat access facility (it is the former site of the Chester Ferry terminal). This access will be eliminated under the present plan to fill over the existing road (Route 534) which bisects the area and abuts the Delaware River, and the area immediately adjacent to the shoreline. Boat access to tidal portions of the Delaware River is also currently seriously limited. The USACE should contact the Department to discuss available options for maintaining fishing access to the shoreline and developing boat access at the Raccoon Island site. Potential options would have to consider the operational schedule for using the upland CDF and methods to restrict public access to the upland CDF site proper.

Given the concerns/issues noted above, additional coordination is needed between the USACE, the Department's Division of Fish, Game and Wildlife, and the NJDEP Dredging Task Force to more fully develop operational and final closure plans for all of the upland CDFs along the Delaware River. Such coordination will also be needed in the future as the project is implemented to ensure satisfactory operation and closure of the upland CDFs in order to minimize potential adverse impacts to the environment and public health.

#### Upland CDFs - Capacity Issues (Chapter 2)

Section 2.2 (page 2-4/7) discusses the disposal capacity needed for each of the Main Channel Deepening Project Reaches. As noted in Upland CDFs - Operation and Management, the dikes at both the "existing" and "new" upland CDFs apparently need to be raised to provide adequate disposal capacity for the 50-year life of the proposed project.

In Reach A, the dikes at the existing National Park site will need to be raised beyond the current height of 50 feet (although it is not clear that the dikes are presently at this height) to an unspecified height to provide capacity for 6.5 million cubic yards (MCY) of dredged material. The ultimate size and height of the National Park upland CDF should be identified and the potential impacts of raising the dikes evaluated. However, notwithstanding the increase in dike height at the National Park site, the Draft SEIS states that "a new site will be required for disposal activities by the Year 2027" (page 2-5). Likewise for Reach B, the dikes at the Pedricktown North and South upland CDFs and the Oldmans site must be raised. Further, the lease at the Oldmans site must be extended beyond 1996; what is the status of this lease? Notwithstanding the required increases in dike heights, a new site(s) would be required by the Year 2030 to provide adequate capacity for the 50-year life of the project.

22. Fishing access at Raccoon Island will be explored with the NJDEP during the Plans and Specification phase of the project.

23. The dredged material disposal sites are projected to be used for a period of 50 years. Final closure plans prepared at this time would most likely be out dated at the end of this project.

24. Comment noted. No response required.

25. The current dikes at National Park are at elevation 30 and the final dike height will be at elevation 50 feet. This would provided a capacity for 3.6 million cubic yards. Each dike raising is engineered to prevent failure or instability. The Corps is in the process of acquiring Oldmans No. 1 disposal areas from Sun Oil Corporation.

Contrary to the discussion noted above, Section 2.3.2.1 (page 2-12) states "[t]he use of existing federal and sponsor upland disposal areas ... provides enough capacity for all initial dredging and 50 year maintenance". And this statement appears to be contradicted in Section 2.7 (page 2-16), which states "[a]dditional dredged material disposal sites will be needed to adequately handle dredged material from the existing Federal project [emphasis added] past the [Y]ear 2020."

Tables 3-1 and 3-2 identify the estimated volumes of dredged material which will be disposed of in each upland CDF. However, the Draft SEIS does not identify the estimated disposal capacities of the four "new" upland CDFs, so it cannot be determined if there is adequate disposal capacity for the estimated dredged material volumes. The USACE should develop a table showing the estimated disposal capacities for all the proposed upland CDFs to be used for this project, and then compare these capacities with the Reach volumes presented in Tables 3-1 and 3-2. The USACE should identify potential disposal sites with capacity adequate for the dredged material from all project Reaches and "sub-Reaches" (see Plates 24 and 25) for the entire 50-year life of the proposed project.

Hydrodynamic and Salinity Modeling (Chapter 5)

The Department has previously noted significant concerns regarding the potential impacts of the Main Channel Deepening project on the salinity regime of the Delaware Estuary. In particular, potential impacts to potable water supplies and shellfisheries were identified. The Department also noted concerns with possible project-induced changes in current and circulation patterns in the estuary.

The modeling completed for the Draft SEIS concluded that the proposed channel deepening will not result in an exceedance of the current Delaware River Basin Commission standard of 180 ppm chlorinity at River Mile (RM) 98. Given the validity of this modeling effort, it appears that the Camden metro-area water supply wells will not be significantly impacted by salinity intrusion in the Delaware River. However, the Department has the following comments/questions on this modeling effort:

- It is not clear what level of water supply depletive use was incorporated into the model. Given the extended life of the proposed project, at the very least Year 2020 depletive uses should have been considered.
- The Draft SEIS concludes that a one foot rise in sea level, combined with the proposed deepening project, could significantly impact the salinity regime of the estuary. However, it states that accurate modeling of such a rise in sea level would also require modeling the Chesapeake Bay-C&D Canal-Delaware estuary system, "which is beyond the scope of this investigation" (Section 5.11.4, page 5-57). Until this modeling is completed, the Department will continue to have concerns with the potential synergistic effects of the Main Channel Deepening on future sea level rise.

26. Additional disposal sites would be needed for the existing 40 foot project as stated. The new sites provide capacity for the 45 foot project. With additional dike raisings at the new sites there is enough capacity for disposal of the dredged material from the initial deepening to 45 feet and for subsequent maintenance over the next 50 years. This includes disposal capacity at both the exiting and new sites.

27. The proposed four new upland disposal sites contain adequate capacity to handle the initial dredging quantities as shown in Table 3-1 and the 50 year maintenance quantities shown in Table 3-2. A detailed capacity analysis is available in Appendix C of the May 1996 Design Memorandum.

28. Comment noted. No response required.

29. The simulations to address the impacts of the proposed 45 foot channel were run with 1986 depletive uses, as determined by DRBC and provided to the Corps of Engineers for application in these model runs. It is our view that it is not necessary to make additional model runs with projected higher depletive uses for a number of reasons. First, there is evidence from recent investigations by USGS that the present DRBC chlorinity standards for RM 98 are overly conservative with respect to possible impacts on PRM water quality in the Camden County area recharged by Delaware River water. Further, it is reasonable to believe that there are many possible alternate drought management strategies which could be investigated and implemented to conserve basin storage for optimal repulsion of salinity/chlorinity in the vicinity of RM98 during drought conditions.

It is the view of the District that the hydrodynamic/salinity modeling performed to date adequately demonstrates that the predicted salinity impacts of the deepened channel are small enough to be considered negligible with respect to water quality and living resources. In addition, the District believes that modeling of existing and potential future sea level conditions demonstrates that impacts of such sea level rise on salinity distribution are comparably small and thus negligible. The use of the terminology "significant impact on the salinity regime" in the EIS did not refer to any anticipated direct effects of combined channel deepening and sea level rise. In fact, the reference to possible "significant impacts on the salinity regime" was based on a speculative link between different sea level rise effects at the east and west ends of the C&D Canal and possible impacts on flow transfers between the two estuaries. The EIS does not state that such impacts are predicted.

In order to put the model-predicted changes in salinity distribution due to deepening and sea level rise into proper perspective, it is necessary to examine the range in salinity which occurs at representative locations within the estuary over a wide range of time scales. Time series of salinity data for each reference location show the variation of salinity over time scales which include the tidal cycle (12.4 hours,) variations over periods of two to six months, and variations over periods with significantly different inflow regimes, from drought to high-flow. Reference is made to EIS Tables 5-2 and 5-5, which respectively present salinity range data for a recurrence of the drought of record (July through November 1965,) and for the period July through November with monthly averaged inflows. In addition, the simulation presented in EIS Section 5.11.3 documents salinity range data for a recent high-flow period, April to May 1993.

As an example of this "natural" variability, data from RM 54 show that for the July - November 1965 simulation, salinity ranged between 6 and 17 ppt. For the same months with long-term averaged monthly inflow, salinity ranged between 1 and 9 ppt. Finally, during the April - May 1993 period, salinity never rose above 0 ppt. This represents a range of salinity from "fresh water" with 0 ppt salinity to "half-strength" seawater at 17 ppt. For perspective on the impacts of deepening and sea level rise, it should be noted that at RM 54, the hydrodynamic-salinity model predicts changes of less than 1 ppt attributable to deepening and sea level rise. A similar, if less dramatic, pattern of salinity variation over time occurs at locations throughout the estuary. It is the view of the District that the large, natural variability of salinity at essentially all locations within the estuary renders the changes associated with deepening and sea level rise largely a negligible environmental impact.

The District and WES utilized the most recent available bathymetric data to schematize the geometry of the entire Delaware Estuary. These data included detailed shore-to-shore hydrographic surveys from Trenton downstream to RM 37 (mouth of the Cohansey River) obtained by the Corps of Engineers in 1992 and 1993. South of RM 37, the most recent NOS hydrographic survey data obtained between 1975 and 1987 were used. The principal changes to the existing estuary bathymetry resulting from this project will include those portions of the channel requiring deepening to the 45 foot project depth, and those areas where beneficial use of dredged material will result in placement of dredged sediment to protect and restore presently eroding wetlands and beaches. The impacts of these changes to existing bathymetry have been addressed in the EIS, Section 3.3.

- It is not clear if the most recent available bathymetric data was used in constructing the model. Also, the potential for further changes in the bathymetry of the bay as a result of the Main Channel Deepening project was not discussed.

The Department's Division of Fish, Game and Wildlife continues to be concerned with the potential adverse impacts of changes in salinity on oysters in the Delaware estuary. The Draft SEIS concluded that the potential impacts to the overall productivity of the estuary will be negligible. The modeling studies predict that salinities over the area occupied by natural oyster seed beds (RMs 25 to 50) will increase from 0.05 to 0.3 ppt, and that the long-term location of the 15 ppt isohaline (an important parameter for oyster production in the estuary) will shift "up to 1.7 miles" in a up-bay direction as a result of the proposed project. The Draft SEIS also notes that salinity intrusion with a deepened channel would typically be "0.0 to 1.7 miles ahead of existing channel salinities" during any particular period of the year.

The Division has consistently expressed concern that any shift in the salinity regime of the estuary may negatively effect oyster production in the bay. Observed differences in oyster populations of the bay may be a result of subtle differences in physical factors, such as salinity. A shift in salinity patterns, as indicated in the Draft SEIS, could result in production limiting impacts to the natural oyster seed bed known as New Beds, the most important bed to the oyster industry of the estuary. The statement in the Draft SEIS that average salinity increases of up to 1 ppt will not effect the oyster populations of the bay is based on computer projections which have not been substantiated by field studies; additional field data is needed to verify this conclusion.

In order to validate the modeling effort, the USACE should initiate a long-term monitoring study of the hydrological features of the estuary and *in situ* oyster populations. This program should establish baseline data at strategic points within the estuary prior to modification of the channel, which will then be monitored for an extended period after the deepening. The data collected during this monitoring program would determine whether the predictions of the modeling effort were valid, and whether the projected subtle shifts in the salinity regime of the estuary result in only negligible impacts to the oyster populations and overall productivity of the Delaware estuary system.

#### Threatened and Endangered Species

Section 1.1.1.1 (page 1-2) states that "[i]n order to minimize impacts to wetlands/wildlife habitat in the upland dredged material disposal areas ... construction during sensitive times of [the] year for wildlife species, such as nesting or migratory periods, will be avoided as much as practicable" (also see Section 6.6.2.1, page 6-22). In order to clarify operational procedures, all of these sensitive time periods should be clearly identified in one place/table in the Draft SEIS.

30. The hydrodynamic/salinity modeling has demonstrated the range of potential salinity impacts due to the proposed deepening under a range of conditions, including a recurrence of the drought of record, the typical "transition" period at the end of the spring high-flow period, and also "average" inflow conditions. The use of the model to address concerns regarding salinity distribution was viewed as the most appropriate approach to apply in this matter. This approach was confirmed through coordination workshops held prior to and during the conduct of the modeling. In fact, modeling is the only valid approach which permits a direct and objective assessment of salinity impacts attributable to changes such as channel deepening or sea level rise. Even the most ambitious pre- to post-deepening monitoring effort would not be able to unambiguously determine if observed salinity differences were the result of channel deepening, as opposed to impacts due to some other cause. This is in large part due to the large natural range in salinity at most locations throughout the estuary, as elaborated above in response to Comment 2.

The District coordinated findings from the salinity model with Rutgers University oyster researcher Dr. Eric Powell. Dr. Powell is a nationally recognized expert on oyster ecology, and concluded that the range of salinity changes predicted by the model would pose no adverse impact on oyster resources. It is our view that Dr. Powell's findings are valid and should be accepted as a reliable indicator of "no significant impact" on oysters in the Delaware Estuary. Further, it is noted that the EPA, in a letter dated March 17, 1997, found the predictive capability of the model very good, and concurred that salinity changes induced by channel deepening will probably have insignificant impacts on drinking water, ground water, and other environmental resources.

31. A Table showing all the environmental windows will be provided in the final SEIS.

Figure 10-1 shows the "greatest sensitivity" to bald eagle populations to be from mid-December through mid-August. Sections 10.4.1.1 (page 10-20) and 10.5.1.1 (page 10-30) discusses USFWS requirements to minimize potential impacts to the bald eagle in the project area. In addition, the Department's Endangered and Non-Game Species Program should be contacted at least six months prior to the use of any of the proposed upland CDF sites. Bald eagles have recently been identified in the project area, so the upland CDF sites will have to be evaluated and examined in more detail immediately prior to their use.

The Department continues to have some concerns regarding the potential impacts of dredging on sea turtles. Section 10.5.2.1 (page 10-31) explains an arrangement for turtle observers to be present during dredging operations, apparently only to document mortality. It is recommended that this observer record all sightings of sea turtles and attempt to understand any relationships with project area, feeding behavior, and/or timing of the sightings. This information could be used to avoid continued deleterious impacts to sea turtles.

Ospreys (State-listed threatened) have been identified as potentially using the Raccoon Island and 15D sites, and the pied-billed grebe (State-listed endangered) may inhabit the tidal marsh adjacent to Site 15G (see Section 6.3.3, page 6-18). The northern harrier has been reported in the vicinity of Egg Island Point. The New Jersey Natural Heritage Program the Department's Endangered and Nongame Species Program should be recontacted just prior to the initiation of construction activities to identify any additional threatened or endangered species which may be impacted by the construction and operation of the proposed upland CDFs.

*Carex frankii*, a sedge on the list of Special Plants of New Jersey, was identified on Site 17G (Section 6.2.5, page 6-11). In addition, the sensitive joint-vetch, Engelmann's flatsedge, and the bur-marigold were identified by the New Jersey Natural Heritage Program as potentially occurring at the four "new" upland CDF sites. The Department's Endangered Plant Species program should be contacted regarding mitigation measures, if needed, to protect populations of these plants which may be impacted by the proposed project (Phone Number: 609-984-1015).

#### Beneficial Uses of Dredged Material

The Draft SEIS makes a number of statements - in numerous sections of the document - that the dredged material is "suitable for beneficial use", essentially because contaminant levels do not exceed various NJDEP soil cleanup criteria. For example, Section 3.2.5 (page 3-22), discussing the final uses(s) of the upland CDF sites, states "[t]he material in these sites is suitable for beneficial uses, and does not require any remediation after project life". This appears to be based on the dredged material meeting the Non-Residential Indirect Contact Soil Cleanup Criteria (see Section 4.1, page 4-19). Given that the proposed upland CDF sites "will be committed to an open space/environmental uses [sic]" (Section 3.2.5, page 3-22), it may not be appropriate to apply the Non-Residential Indirect Contact Soil Cleanup Criteria. In addition, given the concerns raised under Sediment Quality Evaluations, it is not clear that all of the sediments to be dredged will meet the various appropriate NJDEP soil cleanup criteria. Finally,

32. During the next phase of the project (Plans and Specifications) we will work closely with the resource agencies and provide copies of our detailed plans for review. We plan to contact the FWS and NJDEP, Endangered and Non-game Species Program at least 6 months prior to the construction of the CDFs to insure that there are no additional endangered species concerns.

33. The observers do record all sightings of turtles and marine mammals and any other pertinent information. This information is sent to the National Marine Fisheries Service. The District will comply with the recommendations provided by the National Marine Fisheries Service in the Biological Assessment of the District's dredging projects.

34. The District will contact the NJDEP just prior to the start of construction to identify any additional

35. The District will contact the Endangered Plant Species program to determine if any reasonable and prudent measures can be done to avoid and/or minimize impacts to this species.

36. Based on the data collected to date, the data evaluation provided in the SEIS and the additional discussion provided in response to this letter, it is Corps contention that channel sediments meet NJDEP Residential Soil cleanup criteria. The Corps also contends that these sediments would not be detrimental to fish and wildlife resources, or to human health. The U S Army Corps of Engineers, Waterways Experiment Station, the U S Environmental Protection Agency and the U S Fish and Wildlife Service have concurred with these findings.

depending on the particular proposed beneficial use, the dredged material may have to meet additional criteria (for example, engineering standards).

In New Jersey Waters, the USACE is proposing to beneficially use 2.6 MCY of sandy dredged material to restore approximately 135 acres of wetlands and provide shore erosion protection. The proposed beneficial use site is part of the Egg Island State Wildlife Management Area, and is very close to oyster beds (see Figure 3-3). It is noted in the Draft SEIS that the construction of "protective structures to allow for wetland restoration are challenging and may be difficult to achieve" (Section 3.3.3.1, page 3-39). In its Planning Aid Report - Beneficial Use of Dredged Material (August 1995), the U.S. Fish and Wildlife Service discusses conducting a pilot project to evaluate the proposed use of geotextile structures to construct the wetland restoration areas. The Department also supports this call for a demonstration project.

If the Reach E sediments proposed to be used in the wetland restoration project at Egg Island Point are greater than 90% sand, the Department will consider these sediments suitable for the proposed beneficial use, without additional testing. The USACE must submit additional data to demonstrate that this 90% sand criteria will be met (also see Sediment Quality Evaluations). In addition, given the potential for sediment transport onto these nearby oyster beds (see Figure 9-1), it may be appropriate to actively revegetate the wetlands restoration area to provide a more stable substrate, although this may adversely impact use of the area for horseshoe crab spawning.

#### Dredging of Berthing Areas (Section 4.5)

Section 4.5 (page 4-52) of the Draft SEIS discusses the dredging of berthing areas for various industrial facilities and port terminals along the Delaware River; such dredging activities were not previously discussed in the 1992 Final Environmental Impact Statement. Dredging of these areas is described as "[a]n associated feature of the [M]ain [C]hannel [D]eepening project"; it is not clear if the USACE intends to dredge these berthing areas as a part of the Main Channel Deepening project, or if they are to be conducted independently by the owners/operators of the facilities.

A total of 16 sediment core samples were collected at seven of these berthing areas (see Figure 4-1), consisting of the Beckett Street Terminal in Camden and six locations in Pennsylvania; it is not clear if these are the only berthing areas which need to be deepened. In addition, it is not clear if these samples were collected consistent with the requirements of the NJDEP draft dredging guidance manual. Section 4.5 discusses the results of bulk sediment chemistry analyses of the sediment samples. The evaluation of this data was conducted similar that for the channel samples, and suffer from similar limitations (see Sediment Quality Evaluations).

The Department will require additional sampling and testing of all berthing areas proposed to be dredged, depending on the volumes of materials to be dredged, the proposed disposal location, degree of sediment contamination, and site specific characteristics. In addition,

37. Pilot Project at Egg Island Point. As part of the P&S phase of the project, the District will further investigate the need for a pilot project at wetland restoration sites.

38. The sediments to be used to build Egg Island Point are greater than 90% sand and data will be provided to demonstrate this. Page 9-4 of the report describes areas that are recommended for planting because of possible scour, which was coordinated with NJDEP (Bureau of Shellfisheries, Endangered and Non-Game, and Land Use Regulation) and USFWS personnel.

39. The dredging of berthing areas will be conducted independently by the owners/operators of the facilities.

40. The seven berthing areas discussed in the SEIS are the only areas that would require deepening to realize the benefits projected for deepening of the Delaware River main channel. These areas were sampled prior to release of the NJDEP draft dredging guidance manual.

41. The subject berthing areas were tested because these area would required deepening to realize project benefits. As such, the berthing areas are considered associated features of the proposed project. The purpose of the testing was to verify that the sediments are sufficiently clean to permit deepening. Based on the testing the Corps has concluded that there are no significant levels of contaminants in berthing area sediments, and that deepening of these areas can occur. The owners/operators of the berthing areas would be required to obtain the appropriate permits from the U.S. Army Corps of Engineers and the State prior to dredging. If NJDEP required additional testing prior to issuance of the necessary permits, then it would be the owners/operators responsibility to conduct that testing.

approval of the dredging and/or disposal activities in New Jersey may require a various permits specific to each individual berthing area. Given the limited information provided in the Draft SEIS, the Department cannot concur with the statement that the "sediments with port facility berthing areas are sufficiently clean to conclude that dredging and upland dredged material disposal operations would not result in any significant environmental impacts" (page 4-77).

#### General Fisheries Concerns

The Department's Bureaus of Marine and Freshwater Fisheries are concerned that dredging activities and the placement of dredged material at the Egg Island Point site is done at the proper time of the year and in accordance with the Delaware River Fish and Wildlife Cooperative's guidelines. Species of concern include

- American shad and river herring (i.e. blueback, alewife) during their anadromous spring spawning runs;
- shortnose sturgeon on their down-river post-spawning movements into the Philadelphia area;
- striped bass on their spawning runs and in the Marcus Hook/Chester Island Area (potential impacts to rock habitat).

Additional discussion of the dredging operations and more precise timing commitments are needed to protect fisheries resources.

#### Kelly Island Beneficial Use Site

Section 3.3.3.2 (page 3-40) discusses the construction and operation of a 90 acre wetland restoration site at Kelly Island, in the State of Delaware. A geotextile tube structure similar to that to be built at Egg Point Island will be constructed. However, wetland restoration activities at Kelly Island will consist of the placement of 1.8 MCY of fine-grained material, not sand. The Draft SEIS Appendix includes a number of letters from the State of Delaware Department of Natural Resources and Environmental Control concerning the placement of this fine-grained material at Kelly Island, potential impacts to adjacent shellfish beds if the dredged material is not adequately contained, and possible PCB contamination of the dredged material. The State of Delaware has expressed a preference for a sand barrier beach at Kelly Island, as opposed to the wetland restoration project included in the Draft SEIS.

42. The District will comply with the guidelines of the Delaware River Fish and Wildlife Cooperative.

43. The Kelly Island site has been redesigned to use a sand barrier with a geotextile tube core. In addition, less than 200,000 cubic yards of silt will be placed at this site. The silt will be mixed with sand, and the site will be monitored and maintenance of the sand berm will be performed as necessary. Therefore, any possible impacts from silt escaping from the wetland restoration have been greatly minimized and probably eliminated for oyster beds in New Jersey.

A study using high resolution, congener specific PCB methodologies was conducted on the sediments to be used for the Kelly Island ecosystem restoration project. The results of the study indicate that there are no levels of PCBs in these sediments that are of concern to fish and wildlife resources or human health. The State of Delaware has concurred with these findings.



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The NJDEP also has similar concerns with the proposed use of the Kelly Island Site, especially given the acknowledged difficulties in constructing the proposed geotextile tube retaining structure (see Beneficial Uses of Dredged Material) Figure 9-2 shows "Areas Potentially Impacted by Silt if [a] Breach Occurs at Kelly Island". The impact area extends into New Jersey Waters, and may impact a number of oyster seed beds.

45

Finally, the USACE should complete an evaluation of the consistency of all aspects of the proposed Main Channel Deepening project with the Final Comprehensive Conservation and Management Plan of the Delaware Estuary Program.

Attachment #1 includes a number of technical comments on the Draft SEIS.

Thank you for providing the Department the opportunity to review the Draft SEIS for this project. If you have any questions, I may be contacted at (609) 292-2662.

Sincerely,  
  
 Lawrence Schmidt  
 Director  
 Office of Program Coordination

c. Richard Kropp, Land Use Regulation  
 Ruth Ehinger, Land Use Regulation  
 Andrew Gale, Land Use Regulation  
 Robert McDowell, Fish, Game and Wildlife  
 Andrew Didun, Fish, Game and Wildlife  
 John Roe, Non-Point Source Permitting  
 Rich DeWan, Point Source Permitting  
 Dorothy Guzzo, Historic Preservation  
 Joseph Miri, Water Supply  
 Bob Confer, Solid Waste  
 Teruo Sugihara, BEERA  
 Bernie Moore, Engineering and Construction

44. The new design of Kelly Island, as described above, has been accepted by the DNREC. The proposed design should not cause significant adverse impacts to the Delaware Bay environment.

45. The project is consistent with the Comprehensive Conservation and Management Plan for the Delaware Estuary (The Delaware Estuary Plan, 1996). A section will be added to the final SEIS to address this.

ATTACHMENT #1 - TECHNICAL COMMENTS ON THE DRAFT SEIS

46 (1) Table 1-1, page 1-21: notes that the proposed main Channel Deepening project is in "Full Compliance" with the Coastal Zone Management Act. Given the need for additional analyses noted in the main body of the attached letter, the Department believes that this status should be considered only "partial". In addition, note that the previously issued New Jersey Coastal Zone Management Program Consistency Determination was conditioned on the need for a number of additional studies.

47 (2) Table 3-1, page 3-6: includes at category "Killcohook No. 1 via Lehigh Ave." for filling the upland CDF. How is this operation to be completed? What are the potential environmental and other impacts associated with apparently laying a hydraulic pipeline for conveying dredged material in Lehigh Avenue?

48 (3) Plates 24 and 25 show the "sub-Reaches" within the project area and the associated upland CDF or beneficial use site for the dredged material from each sub-Reach. However, a number of segments of the project are colored "white" - i.e. no disposal/beneficial use location is identified. Please explain/revise as appropriate.

49 (4) Section 5.11.2, page 5-48 and Table 5-5: states that in the oligohaline portion of the Delaware estuary (0.5 - 5 ppt salinity), salinity will increase by 0 to 1.6 ppt, which is potentially a relatively significant change when compared with existing ambient levels. What are the potential impacts of such a change?

50 (5) Table 6-4 shows existing and "after project" wetlands at the four "new" upland CDF sites. A similar table should be developed for the nine "existing" upland CDFs. In addition, given that the upland CDF sites will ultimately be "uplands", will the proposed Main Channel Deepening project, upon its "completion" in the Year 2050, essentially result in a net loss of wetlands? What measures can be employed to minimize and mitigate for any such loss of wetlands?

51 (6) Section 6.2.5, page 6-11: notes the presence of subsurface drainage tiles at proposed upland CDF Site 17G. How will the presence of these drainage facilities affect the operation of the proposed upland CDF?

52 (7) Section 6.6.1.2, page 6-22: briefly discusses a planned wetlands mitigation bank adjacent to upland CDF Site 17G. The Draft SEIS should provide a more detailed discussion of this bank and evaluate the potential impacts of the use of Site 17G on this mitigation bank.

53 (8) Plate 13: shows some type of right-of-way across the southwestern section of the proposed Raccoon Island upland CDF. What is the ROW?

46. It is the intention of this office to fully resolve NJDEP comments and obtain the NJDEP Coastal Zone Management Compliance. Consequently, the project would be in full compliance with CZM when the final report is completed.

47. Lehigh Avenue only refers to the north side of disposal area. No pipe will be placed on or near Lehigh Avenue.

48. No dredging needs to be done in the white.

49. The report has a mistake. The increase in salinity would be from 0 to 0.8 ppt (See Table 5-5). This correction will be made in the final SEIS.

50. The management scenario of the upland dredged material disposal sites includes using the existing Federal sites in the rotation that allows leaving portions of the 4 new sites as wetlands. The four new sites will be uplands by 2050 and will be available for environmental/open space. 372 acres of high quality wildlife habitat, including freshwater tidal marshes, adjacent to the upland sites will be maintained as undeveloped land. We are restoring 135 acres of high quality, tidal wetlands at Egg Island Point and protecting hundreds of additional acres from erosion. We believe that these measures, in addition to the management of the 4 new sites as wetlands for the life of the project, will have an overall beneficial effect on wetland resources.

51. The subsurface drainage tiles are only for draining cropland. They will either be removed, or if left in place, and will not effect the disposal operation.

52. Intermittent use of disposal area 17G and ponding of water for environmental enhancement will not detrimentally effect the wetland bank area. Experience at our Delaware River disposal areas suggests that seepage through dikes is minimal when ponding height is less than 10 feet. Potential groundwater elevation changes to disposal operation may enhance the viability of the wetland bank. The high elevations of the wetland bank will require a supply of water to maintain the viability of this project. It is the intent of the Corps to operate its disposal operation at site 17G in cooperation with the wetland bank.

53. The rights of way are for gas pipelines and electric line.

(9) Section 13.4.1, page 13-4: for the Marcus Hook anchorage area, states "[s]ince density and diversity of fish species are lowest during the winter months (1 December to 15 March), limiting blasting to this time period should minimize impacts to fish". However, the fish studies summarized in Section 13.2 present only limited data concerning fish abundance and diversity during the winter in this area. Additional studies of potential impacts of blasting on fisheries in the Marcus Hook area may be needed.

54. On page 13-8, it is stated that monitoring studies will be conducted during blasting to insure that the impacts are minimal. The design and results of these studies will be coordinated with the appropriate resource agencies, including the NJDEP, PA Fish and Boat Commission, and NMFS.



**State of New Jersey**

Christine Todd Whitman  
Governor

Department of Environmental Protection

DIVISION OF PARKS AND FORESTRY  
HISTORIC PRESERVATION OFFICE  
CN-404

TRENTON, N.J. 08625-0404  
TEL: (609) 292-2023  
FAX: (609) 984-0578

Robert C. Shinn, Jr.  
Commissioner

December 23, 1996  
HPO-L96-29

Robert L. Callegari  
ATTN: Environmental Resources Branch  
U.S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia PA 19107-3390

Dear Mr. Callegari:

In accordance with 36 CFR Part 800: Protection of Historic Properties, as published in the Federal Register on 2 September 1986 (51 FR 31115-31125), I am providing continuing Consultation Comments for the following proposed undertaking:

**Delaware River Comprehensive Navigation Study**

**Main Channel Deepening Project**

**Submerged and Shoreline Cultural Resource within  
New Jersey Portions of the Area of Potential Effects  
(APE)**

**Continuing Section 106 Consultation**

No response required.

---

**SUMMARY:** Adequate effort has been invested in identifying historic properties in New Jersey portions of the APE for this proposed undertaking. Two underwater archaeological properties have been identified that are eligible for listing in the National Register of Historic Places. The proposed undertaking will have No Effect on these historic properties if project activities are conducted in accord with the Army Corps plan to establish a 200 ft buffer around each property within which there will be no disturbance of river bottom sediments.

These comments are in reply to: (1) Public Notice CENAP-PL-E-97-01 requesting comments on the Draft Supplemental EIS, and (2) your letter of December 16, 1996, requesting the New Jersey State Historic Preservation Officer's (NJ SHPO's) Section 106 comments regarding identification of historic properties, assessment of effects for the proposed undertaking, and review comments on the following report:

Dolan Research, Inc., and Hunter Research, Inc.

1995 Submerged and Shoreline Cultural Resources Investigations, Disposal Areas and Selected Target Locations, Delaware River Main Channel Deepening Project, Delaware, New Jersey & Pennsylvania.  
Submitted to the U.S. Army Corps of Engineers, Philadelphia. (HPO Accession # MULT A81b)

In my opinion, the EIS and this report demonstrate that adequate effort has been invested in (1) identifying historic properties within New Jersey portions of the APE as currently defined, and (2) planning to avoid adverse effects to historic properties.

#### 800.4 Identifying Historic Properties

I concur with your assessment, as formulated by Dolan and Hunter, that the following two underwater archaeological properties are eligible for listing in the National Register of Historic Places:

1. The Steamboat Excelsior site in GLOUCESTER COUNTY, LOGAN TOWNSHIP, is eligible under Criteria A, B, and D. It holds the remains of the 232 foot long, wooden hull, three deck, side paddle wheel steamboat Excelsior that was built in 1880, and burned and sank in 1892. It is significant in the areas of commerce and transportation, was the product of a significant builder, and has potential to yield important new information regarding maritime trade, recreation, and other commercial activities of the late 19th century in the Delaware Bay region.
2. The Canal Coal Barge site in GLOUCESTER COUNTY, GREENWICH TOWNSHIP, is eligible under Criteria A, C, and D. It holds the bow portion of a sectional canal coal barge, a distinctive vessel type used for shipping coal from the Eastern Pennsylvania coal fields to urban locations along the Mid-Atlantic seaboard during the mid-19th century. It is significant in the areas of pre-Civil War era commerce and transportation, and it appears

to be the sole surviving representative of a distinct type of vessel.

A third historic archaeological property, one that is potentially eligible, was recorded in proximity to the Egg Island Point overboard disposal area in CUMBERLAND COUNTY, DOWNE TOWNSHIP. This property, the Egg Island Point lighthouse site, was not subjected to evaluative test excavation because it lies outside of the APE as currently defined.

#### 800.5 Assessing Effects

The proposed undertaking will have No Effect on these historic properties if project activities are conducted in accord with the Army Corps plan to establish a 200 ft buffers around them, within which there will be no disturbance of river bottom sediments.

#### Report Review Comments

The draft report is well organized, well written, and clearly demonstrates that adequate effort has been invested in identifying historic properties in New Jersey portions of the APE. It is clear that this report has been prepared by professional authorities in the subject of Delaware Bay's submerged terrestrial and underwater cultural resources. Appendices A and B, "Delaware Bay and River Shipwreck List," and "Major Shipyards of the Delaware River," are important additions to the report and represent valuable resources for future work. The report represents a major contribution to our knowledge of this field as well as providing sound recommendations for consideration of historic properties in project planning. No substantive additions or corrections are suggested.

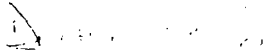
Following are several minor points that should be considered in finalizing the report:

1. p. 1-13, para 4, 1st sentence; and p. 1-15, 2nd para, 1st sentence: Ames et al. (1987) is cited as a reference for New Jersey, but it is identified as a document for Delaware in the References Cited.
2. p. 10-4, para 1: Several matters of tense could be changed to improve readability.

**Additional Comments**

Thank you for requesting our comments on the DSEIS, the technical report, the historic property identification, and effects of this proposed undertaking. Please call Mike Gregg of my staff at 609 633 2395 with questions.

Sincerely,

  
Dorothy P. Guzzo,  
Deputy State Historic  
Preservation Officer

DPG:MLG  
MLG:C:\WD\96-6 (and 97-531)

c: Michael Swanda, ACOE



HOUSE OF REPRESENTATIVES  
STATE OF DELAWARE  
LEGISLATIVE HALL  
DOVER, DELAWARE 19901

SHIRLEY A. PRICE  
R.D. 2, BOX 120  
MILLSVILLE, DELAWARE 19970  
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E-MAIL: SHPRICE@LEGIS.STATE.DE.US

June 19, 1997

COMMITTEES  
AGRICULTURE  
EDUCATION  
ENVIRONMENTAL MANAGEMENT  
HEALTH & HUMAN DEVELOPMENT  
LAND USE & INFRASTRUCTURE  
NATURAL RESOURCES  
TRANSPORTATION

Mr. John Brady  
U.S. Army Corps Engineer District  
100 Penn Square East  
Philadelphia, PA 19107-3390

RE: Delaware River Main Channel Deepening Project  
(Delaware, Pennsylvania, New Jersey)

Dear Mr. Brady,

I write to add my request for a public hearing to those of our Department of Natural Resources and our Mobile Surf Fishermen and other concerned citizens. I know the importance of the Channel Deepening Project and support the project. My concerns are with our local industries and fisherpeople who are very concerned about the location of the dredging spoils. I am positive that solutions exist for disposing of the dredging material that will be productive rather than harmful to other populations and interests.

I do hope you will work with Delaware officials and residents for a solid solution.

Thank you.

Shirley A. Price  
State Representative  
38th District

According to the *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR 1506.6 (c)) there are two criteria to use when deciding whether or not to hold a public hearing:

1. Substantial environmental controversy concerning the proposed action or substantial interest in holding the action.
2. A request for a hearing by another agency with jurisdiction over the action supported by reasons why a hearing will be helpful.

During this current phase of study, the Corps met with conservation organizations in New Jersey, Pennsylvania, and Delaware, including a public meeting at the Camden Aquarium on November 4, 1993, where both economic and environmental interests expressed their concerns so that the Corps could consider them during this phase of study. The Corps is willing to continue to meet with other groups and individuals to discuss specific issues in workshops.

Based on a decade-long study record, the Corps of Engineers does not consider that this project is controversial. Over 325 copies of the SEIS were distributed, including copies to 36 libraries in the area. In addition, over 2000 public notices were mailed, to make people aware of the availability of the SEIS. Only 1 state representative, 7 organizations, and 3 individuals requested a public hearing. No agency with jurisdiction over the project requested a public hearing. Delaware requested an informational public meeting. As a result, the Corps has met with a number of fishing groups to discuss their concerns, and will continue to coordinate with this group to insure that no significant construction impact will occur to Delaware's aquatic resources.

The purpose of this Supplemental EIS is to reaffirm the conclusions that were drawn from the Final EIS in 1992. The Corps believes that the topics that were left over from the 1992 EIS have been answered both in study newsletters and in this document, and that a public hearing would not provide additional substantial information.





STATE OF DELAWARE  
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL  
DIVISION OF SOIL AND WATER CONSERVATION

OFFICE OF THE  
DIRECTOR

89 KINGS HIGHWAY  
P.O. BOX 1401  
DOVER, DELAWARE 19903

TELEPHONE: (302) 739-3451

May 1, 1997

Robert L. Callegari  
Chief, Planning Division  
Philadelphia District  
U. S. Army Corps of Engineers  
100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390

**RE: Consistency Certification**  
**Delaware River Main Channel Deepening Project**

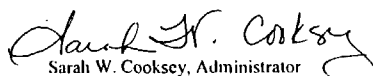
Dear Mr. Callegari:

The Delaware Coastal Management Program (DCMP) has received and reviewed your consistency determination for the above referenced project. Pursuant to National Oceanic & Atmospheric Administration regulations (15 CFR 930), the DCMP concurs with your consistency determination for the deepening of the Delaware River Federal navigation channel from a depth of 40 feet to 45 feet. The DCMP certifies this project consistent with its program policies after review of the 1997 Draft Environmental Impact Statement, post-informational studies, and conditions agreed to by the Corps of Engineers in their April 30, 1997 letter. Our concurrence will be based upon the restrictions and/or conditions placed on any and all permits issued to you for this project.

This consistency certification in no way guarantees that the State of Delaware will contribute funding to the non-federal sponsorship of this project. Due to the large scale of this project, the DCMP requests that the Corps of Engineers hold an informational public meeting for the citizens of the State of Delaware so that they may be aware of this project and understand its scope.

The DCMP would like to thank the Corps for their coordination and cooperation in the review of this project and we look forward to working with you in the future. If you have any questions regarding this determination please contact me at (302) 739-3451.

Sincerely,

  
Sarah W. Cooksey, Administrator  
Delaware Coastal Management Program

SWC/jll  
cc Secretary Christophe A.G. Tulou, DNREC

F:\96\CONSIST\CLF196\96.018

Please refer to response letter dated 20 April 1997 in Appendix A.

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.



STATE OF DELAWARE  
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL  
DIVISION OF SOIL AND WATER CONSERVATION

89 KINGS HIGHWAY  
P.O. BOX 1401  
DOVER, DELAWARE 19903

TELEPHONE: (302) 739-3451

OFFICE OF THE  
DIRECTOR

February 14, 1997

Mr. Robert L. Callegari  
U.S. Army Corps of Engineers  
Philadelphia District  
Wanamaker Building  
100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390

RE: *Federal Consistency Certification*  
*Delaware River Main Channel Deepening Project*

Dear Mr. Callegari:

The Delaware Coastal Management Program (DCMP) has received and reviewed the Army Corps of Engineers' federal consistency determination and the January 1997 Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project. Based upon the DCMP's review of this project and pursuant to National Oceanic and Atmospheric Administration Regulations, 15 CFR 930, the DCMP will be unable at this time to provide the Army Corps of Engineers with final federal consistency concurrence due to additional information requirements outlined in this letter.

In 1992, the DCMP granted conditional federal consistency concurrence to the Army Corps of Engineers for the Draft Environmental Impact Statement and Feasibility Stage of the Delaware River Main Channel Deepening. The conditions of the concurrence were that additional testing, assessments, and impact evaluations be conducted during the Pre-construction, Engineering and Design phase of the project and that at the end of this phase another consistency determination be submitted to the DCMP. In December of 1996, the DCMP received the Draft Supplemental Environmental Impact Statement to the original 1992 Environmental Impact Statement along with the federal consistency determination for this phase.

The information contained within this 1997 Draft Supplemental Environmental Impact Statement is not sufficient for the DCMP to make an informed decision on whether or not this project is consistent with its program policies. Specifically, the information and data that the DCMP needs to evaluate are:

1. The final design and plans for the Kelly Island beneficial use site;
2. The complete and final summary and analysis of the Mono-ortho, dye-ortho and coplanar congener specific PCB's for the channel sediment samples;

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2/14/97

1. A re-design of the Kelly Island was provided.
2. Final report was provided.

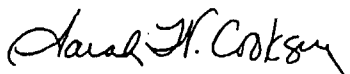
3. Additional information regarding the potential for increased erosion at Pea Patch Island associated with the deepening of the Main Channel;
4. The methods and specific time of year that dredging is scheduled to occur, in efforts to protect Delaware's wildlife resources; and,
5. The impacts of dredging upon the declining population of Atlantic Sturgeon in the Delaware River.

In light of the information requested above, the DCMP would like to request a meeting with the Corps to discuss the specific needs and informational requirements that need to be met. Prior to such a meeting, more formal, detailed, and specific comments will be forwarded to the Corps.

Since this project is so large in size and that the information in hand is not yet complete, the DCMP will defer its final consistency concurrence until this critical information is received. At such time that the requested information is received, and adequate review time is provided, the DCMP will make a final concurrence decision.

The DCMP would like to thank the Corps for their cooperation in working with us so far, and we look forward towards achieving this project's success together.

Sincerely,

  
Sarah W. Cooksey, Administrator  
Delaware Coastal Management Program

SWC/jll

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2/16/97

3. Corps model studies and results on the potential for increased erosion at Pea Patch Island associated with the 45 foot project were provided.

4. Please refer to Section 1.1.9 and Table 1-1 of this SEIS. Specific information on the impacts of dredging on the wading bird colony at Pea Patch Island has been provided and is discussed in this SEIS in Section 10.4.3.6.

5. This information has been provided.



STATE OF DELAWARE  
DEPARTMENT OF NATURAL RESOURCES  
& ENVIRONMENTAL CONTROL  
DIVISION OF WATER RESOURCES  
89 KINGS HIGHWAY, P.O. Box 1401  
DOVER, DELAWARE 19903

WETLANDS & SUBAQUEOUS LANDS SECTION

TELEPHONE (302) 739-4661  
FACSIMILE (302) 739-3491

April 11, 1997

Mr. John Brady  
U.S. Army Corps of Engineers  
100 Penn Square East  
Philadelphia, PA 19107

RE: Delaware River Main Channel Deepening Project

Dear Mr. Brady:

In a Fax to this office dated January 24, 1997, you stated that, "The Corps does not intend to apply for a 401 because we have an exemption under 404 (R)" I requested and have received an opinion from the Delaware Office of the Attorney General regarding Section 404(r) of the Clean Water Act (CWA).

To summarize, it is our position that section 404(r) specifically exempts qualifying projects from the requirements of section 404 but not the requirement of section 401 of the CWA. The limited nature of this exemption is also established in 33 C.F.R. §323.4(d) which provides that, "Federal projects which qualify under the criteria contained in Section 404(r) of the CWA are exempt from Section 404 permit requirements, but may be subject to other state and or Federal requirements".

Unless this office is provided with irrefutable justification for why water quality certification is not required, we will expect an application for a subaqueous lands permit and section 401 Certification for the above referenced project.

If you have any questions regarding this matter, please feel free to call.

Sincerely,

William F. Moyer  
Program Manager II  
Wetlands and Subaqueous  
Lands Section

cc: Gerard L. Esposito  
Jeanne Langdon  
Sarah Cooksey  
Laurie Moyer  
Laura Herr

WFM:jd  
4/14/97

*Delaware's good nature depends on you!*

A Section 401 water quality certification which is tied directly to the section 404 permit, is not required based on the 404(r) exemption, as explained in Section 1.2 of the SEIS. As stated in Table 1-2 of the SEIS, all appropriate state and local permits will be obtained prior to construction.



STATE OF DELAWARE  
DEPARTMENT OF STATE  
DIVISION OF HISTORICAL AND CULTURAL AFFAIRS  
HISTORIC PRESERVATION OFFICE  
15 THE GREEN  
DOVER • DE • 19901-3611

TELEPHONE (302) 739-5685

FAX (302) 739-5660

February 4, 1997

Mr. Robert L. Callegari  
Chief, Planning Division  
Environmental Resources Branch  
Philadelphia District  
Corps of Engineers  
100 Penn Square East  
Philadelphia, PA 19107-3390

ATTN: Michael Swanda

Dear Mr. Callegari:

I have received and reviewed the *Delaware River Main Channel Deepening Project Draft Supplemental Environmental Impact Statement (DSEIS)*. Based on my review of this document, we believe there are no significant historic resources within the Reedy Point North or South disposal sites, the proposed overboard disposal site, the proposed wetland restoration site of Kelly Island or the sand stockpiling locations near Slaughter and Broadkill Beaches. The employment of these facilities will not any significant historic resources. The proposed deepening of the main channel to 45 feet, pursuant to the Advisory Council on Historic Preservation's (Council) regulations, will have an adverse effect (36 CFR 800.9(b)(1) and (4)) on significant submerged and terrestrial archaeological site data associated with the National Register listed Fort Delaware; specifically, on that portion of Pea Patch Island owned by the Corps. Significant historic archaeological data continually erode from the unprotected shoreline due to high energy wave action. This is especially apparent after storm events but also seen daily when large vessels traverse the federal channel. The Corps has taken no action to remedy this eroding shoreline problem which this Office identified in 1990. The proposed channel deepening with its sloped sides, will effectively bring the federal channel closer to the island; thereby, accelerating the erosion process. As part of this project, following the Council's regulations (36 CFR 800.5(c) and (e)), the Corps should develop and implement measures which will stabilize the shoreline under its jurisdiction.

With the above cited adverse effect on Fort Delaware, we cannot concur with your agency's "No Effect" determination. If you have any questions or wish to discuss this matter further, please do not hesitate to contact me at your

See response letter dated July 2, 1997 in Appendix A.

Letter to Callegari  
February 4, 1997  
Page 2

convenience. Thank you.

Sincerely,

A handwritten signature in cursive script, appearing to read "Faye L. Stocum".

Faye L. Stocum  
Archaeologist

cc: Jennifer Lukens, DNREC CZMP  
Charlene Dwin-Vaughn, ACHP  
Cara Blume, DNREC P/R

Post-It Fax Note	7571	Date	2/14/97	Page	2
To	Robert L. Callegari	From	John Robinson		
Co./Dept.		Code	PR Council		
Phone #	215 654-6555	Phone #			
Fax #	215 654-6543	Fax #			

# RECREATION COUNCIL

February 14, 1997

Mr. Robert L. Callegari  
ATTN: Environmental Resources Branch  
U.S. Army Corps of Engineers  
Wanamaker Building, 100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390

Dear Mr. Callegari:

The Delaware Parks and Recreation Council was established by State Law to advise the Director of Parks and Recreation, the Secretary of Natural Resources and Environmental Control and the Governor on matters relating to the development, management and conservation of lands within the State Park system. We have recently become aware that the Corps is evaluating a project on the Delaware River that could have potentially devastating impacts on the State's oldest Park - Fort Delaware State Park. To our knowledge this project, the deepening of the Delaware River Main Channel, has ignored the increased erosion impacts likely to occur on Pea Patch Island.

As you may be aware, the historic Island, with its Civil War era fortification (Fort Delaware), historic seawall, and other archaeological remains, is listed on the National Register of Historic Places. The State is currently updating the nomination and believes it is eligible for National Historic Landmark status. Pea Patch's heronry, a dedicated State Nature Preserve on the northern end of the Island, provides critical habitat to thousands of wading birds, and is the largest heronry north of Florida.

Last year, over 22,000 visitors came to Fort Delaware State Park from the Delaware City ferry dock. This year a new pier at Fort Mott in New Jersey will open, and ferry service to the Island from both Delaware and New Jersey will be instituted. With over 100,000 visitors in 1996, tourists from Fort Mott are expected to over double last season's visitation to the Island. The expanded ferry service, together with over \$500,000 in improvements to the historic fort over the last several years, is rapidly transforming the Island into a regional tourist attraction generating many new jobs in two states.

Deepening of the channel threatens to rapidly accelerate erosion that has been occurring on the southeast end of the Island for over two decades. This portion of the Island, which is very close to the channel, is owned by the Corps. The Corps has been aware of the erosion for many

The District has re-evaluated the potential for increased shoreline erosion on Pea Patch Island resulting from the proposed deepening of the Delaware River Main Channel. This research analyzed various data to determine 1), if deepening the channel would increase current velocities and head values, and impact channel side-slope profiles, 2) if vessels using the deepened 45 foot channel would generate larger waves than presently occur with the 40 ft. channel, and 3) if these predicted changes in current velocities, head values, side-slope profiles and wave heights would detectably increase the shoreline erosion on Pea Patch Island (see Appendix C).

Comparison of model-predicted current velocities for the 40 ft and 45 ft channel geometrics at Pea Patch Island showed negligible velocity differences attributable to the deepened channel. It was thus concluded that the channel deepening will have a negligible effect on current velocities and water levels at the subject shoreline, and there will be no shoreline erosion induced or exacerbated by the channel deepening.

The principal variables considered in the ship wave analysis included vessel shape characteristics, vessel draft, vessel speed, sailing direction, and distance from the shoreline. The analysis assumed that tankers, due to their size, speed, and number of transits, constituted the critical class of vessels for this analysis. Further, based on data developed for the economic analysis of the proposed deepening, it was assumed that the fleet distribution would be identical for the 40 and 45 foot channels, with vessels simply loaded five feet deeper. The results indicated that maximum wave heights at the shoreline of Pea Patch Island would increase in the order of 4 per cent for the case of the design vessel loaded to a five-foot greater depth. Thus it was concluded that the deepening project would not detectably increase the existing shoreline erosion problem related to ship waves.

A review of existing shoreline profiles and hydrographic data adjacent to Pea Patch Island show that the majority of channel depths are well below the proposed new dredging depth of 45 feet. Only minimal new dredging in isolated high spots will occur in the vicinity of Pea Patch Island. This proposed work will not significantly effect the existing channel side-slope profiles and will not result in a movement of the federal channel closer to the Island.

Based on the above analyses, it is the opinion of the Philadelphia District that deepening the channel to a depth of 45 feet will not increase shoreline erosion on Pea Patch Island, and consequently, will not impact significant cultural resources along the shoreline.

However, the existing erosion problem on the shoreline of Pea Patch Island is being addressed by the Corps of Engineers and State of Delaware. In April 1997, the Corps met with the State of Delaware to discuss and address the ongoing erosion problem. The State has retained a consulting firm to prepare plans to stabilize the shoreline. Corps will participate in review of the plans. In addition, Corps has requested construction funds as part of our maintenance of the existing 40 foot project. Close coordination will be maintained with the State throughout the design and construction of the proposed erosion plan.

Mr. Robert L. Callegari  
February 14, 1997  
Page 2

years, particularly since 1990 when eight gun carriages were retrieved from the eroding shoreline. There have been ongoing conversations with the Corps, who have acknowledged this issue.

Failure by the Corps to address accelerating erosion of federal land is threatening the balance of the Island, which is under State ownership. This erosion is now to the point where Fort Delaware, the historic island and seawall, and other archaeological remains are in jeopardy. The long term stability of the heronry is also threatened. A deepened channel, with resultant larger vessels and increased wave action, will only worsen existing problems.

In light of continued Corps inaction to protect the historic resources on their 19 acres of Pea Patch Island, as required under federal law, the State has started on its own to develop construction documents to stabilize the shoreline. It is hoped that documentation of the gravity of the current situation will result in appropriate action by the Corps. The success of this project, however, is dependent upon a design that anticipates the increased wave action of a deepened channel.

We request that a public meeting be held in order for the citizenry of Delaware and New Jersey to understand the impacts of the deepening project on one of the region's most important historic treasures. Thank you for your attention to this matter.

Sincerely,

*Eugene C. Robinson*

Eugene C. Robinson  
Chair

cc: Charles Salkin  
Mark Chura





Pennsylvania Department of Environmental Protection

Rachel Carson State Office Building  
P.O. Box 2063  
Harrisburg, PA 17105-2063  
February 4, 1997

Policy Office

Mr. Robert L. Callegari  
Chief, Planning Division  
Philadelphia District, Corps of Engineers  
Department of the Army  
Wanamaker Building, 100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Mr. Callegari:

The Pennsylvania Department of Environmental Protection (DEP) has reviewed the draft supplemental environmental impact statement (SEIS) regarding the Delaware Main Channel Deepening Project. We have the following comments:

The Department's main concern regarding this project has been the potential for increase in magnitude and upstream migration of salinity that could result, and the possibility of a significant impact on Philadelphia's water supply, the Potomac-Raritan-Magothy aquifer, as well as increased problems to industrial users in Pennsylvania.

Sections of the SEIS that address these concerns include Chapter 5 and Sections 7.1 and 7.2. In order to develop the information of Chapter 5, the Corps has utilized a three-dimensional hydrodynamic model to predict changes in Delaware River and Estuary salinity under various flow scenarios. These scenarios were coordinated with the various water resources agencies of the Delaware River Basin.

The SEIS concludes that "deepening of the Delaware River navigation channel will have a negligible effect on the recharge characteristics of the aquifer" and that "although the proposed channel deepening is predicted by the salinity model to increase [river mile] 98 chlorinity with a recurrence of the drought of record, the resulting 30-day average chlorinity will still be below the present standard of 180 ppm." Moreover, the SEIS points out "Philadelphia's intake at the Samuel Baxter Treatment Plant at river mile 110 is well upstream of [river mile] 98 where the chlorinity standard is set."

PADEP correctly observes that there are differences in predicted salinity response between the 3D hydrodynamic model used in the present study, and the 1D salinity model used by DRBC. PADEP further states "it does not appear that the conclusions of the SEIS would be invalidated by minor adjustments in salinity intrusion findings." It is expected and reasonable that there are differences between results from the two models. The District concurs with PADEP's conclusion.

Mr. Robert L. Callegari

- 2 -

February 4, 1997

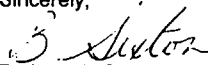
In recent discussion with the Delaware River Basin Commission (DRBC) Operations Staff, who have independently modeled salinity changes resulting from the proposed channel deepening using a different model, DEP determined that some discrepancies still exist between modeling results from the DRBC's and Philadelphia District's salinity models. These discrepancies should be resolved. However, it does not appear that the conclusions of the SEIS would be invalidated by minor adjustments in salinity intrusion findings.

Therefore, this Department concurs with your final determination that the proposed Delaware River Main Channel Deepening Project is consistent with Pennsylvania's Coastal Zone Management Program.

If you have any questions, please feel free to contact William A. Gast, Chief of the Division of Water Use Planning, DEP's Bureau of Watershed Conservation at (717) 772-4048.

We appreciate the opportunity to comment on this proposal.

Sincerely,

  
Barbara A. Sexton  
Director, Policy Office



Pennsylvania Department of Conservation and Natural Resources

Rachel Carson State Office Building  
P.O. Box 8552  
Harrisburg, PA 17105-8552  
February 19, 1997

**Bureau of Forestry**

717-787-3444  
Fax 717-783-5109

Robert L. Callegari  
Environmental Resources Branch  
U.S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390

PER reference no: 004992

RE: PNDI Review for Delaware River Main Channel Deepening Project, Delaware and Philadelphia Counties

Dear Mr. Callegari:

In response to your notice of January 3, 1997, our office has compared the referenced site with the files of the Pennsylvania Natural Diversity Inventory (PNDI) information system. There are several **confirmed and historic** occurrences of rare, threatened and endangered species adjacent to the project boundaries. In addition, Little Tinicum Island, a State Forest Natural Area, is also of special concern due to its proximity to the main channel, proposed for dredging.

I.

The following **confirmed** occurrences of plant species have been documented on the intertidal marsh of Little Tinicum Island.

Scientific Name, Common Name	Date last observed	State Status
<i>Pluchea odorata</i> , Shrubby Camphor-weed	1991	Endangered
<i>Sagittaria calycina</i> var. <i>spongiosa</i> , Long-lobed Arrow-head	1991	Endangered
<i>Sagittaria subulata</i> , Subulata Arrow-head	1991	Rare
<i>Cyperus engelmannii</i> , Engelmann's Flatsedge	1991	Rare
<i>Scirpus smithii</i> , Smith's Bulrush	1991	Threatened
<i>Heteranthera multiflora</i> , Multiflowered Mud-plantain	1991	Endangered
<i>Echinochloa walteri</i> , Walter's Barnyard-grass	1991	Endangered

1. The Corps does not anticipate impacts to Little Tinicum Island, and will meet with personnel from the Bureau of Forestry to discuss their concerns.

February 19, 1997

The following **confirmed** occurrences of plant species have been documented within a mile of the project boundaries.

Scientific Name, Common Name	Date last observed	State Status	Type of Habitat
<i>Amaranthus cannabinus</i> , Waterhemp Ragweed	1991	Rare	Tidal Marsh
<i>Eleocharis obtusa</i> var. <i>peasei</i> , Wright's Spike Rush	1982	Endangered	Tidal Marsh
<i>Zizania aquatica</i> , Indian Wild Rice	1982	Rare	Tidal Marsh

We recommend an on-site meeting with Bureau of Forestry personnel to determine the locations of species of special concern in relation to disturbance associated with the project, and an evaluation of hydrological changes potentially affecting the tidal area of Little Tinicum Island. Please contact us at your convenience to schedule this meeting.

The following **confirmed and historic** occurrences of species under the jurisdiction of the Pennsylvania Fish and Boat Commission have been documented within a mile of the project boundaries.

Scientific Name, Common Name	Date last observed	State Status
<i>Pseudemys rubriventris</i> , Redbelly Turtle	1985	Threatened
2. <i>Rana sphenoccephala</i> , Coastal Plain Leopard Frog	1941	Endangered
<i>Enneacanthus obesus</i> , Banded Sunfish	1978	Uncommon

Please contact Andy Shiels at the Pennsylvania Fish and Boat Commission, Division of Fisheries Management, 450 Robinson Lane, Bellefonte, PA 16823, (814)359-5113, for recommendations regarding recommendations for these species.

The following **confirmed and historic** occurrences of species under the jurisdiction of the Pennsylvania Game Commission have been documented within a mile of the project boundaries.

Scientific Name, Common Name	Date last observed	State Status
3. <i>Circus cyaneus</i> , Northern Harrier	1991	Rare
<i>Asio flammeus</i> , Short-eared Owl	1991	Endangered
<i>Ixobrychus exilis</i> , Least Bittern	1984	Threatened
<i>Bartramia longicauda</i> , Upland Sandpiper	1987	Threatened
<i>Tyto alba</i> , Barn Owl	1991	Rare
<i>Cistothorus palustris</i> , Marsh Wren	1991	Rare

2. The Pennsylvania Fish and Boat Commission reviewed the draft SEIS and did not find any areas of concern. Their letter is included in the final SEIS.

3. The Pennsylvania Game Commission reviewed the draft SEIS and did not anticipate any significant impacts to state endangered birds or mammals. Their letter is included in the final SEIS.

February 19, 1997

Please contact Denver McDowell at the Pennsylvania Game Commission, Bureau of Land Management, 2001 Elmerton Avenue, Harrisburg, PA 17110-9797, (717) 783-8743, for recommendations for these species.

This response represents an up-to-date summary of the PNDI data files and is applicable for one year. However, an absence of recorded information does not necessarily imply an absence of species on-site. A field survey of any site may reveal previously unreported populations.

PNDI is a site specific information system describing plant and animal species of special concern, exemplary natural communities and unique geological features. PNDI is a cooperative project of the Department of Conservation and Natural Resources, The Nature Conservancy and the Western Pennsylvania Conservancy.

Legal authority for Pennsylvania's biological resources resides with three administrative agencies which are outlined in the enclosure entitled PNDI Management Agencies. If information provided by the PNDI system is to be published in any form, the Inventory should be informed at the outset and credited as the source. Please phone this office if you have any questions concerning this response or the PNDI system. For future correspondence regarding this project, please use the PER reference number above. Thank you.

Sincerely,



Dan Devlin  
Chief  
Resource Planning

cc: James E. Tabor, DEP, CZM  
Joseph A. Feola, DEP Southeast Regional Office  
Mike McCarthy, USFWS  
Mike Moore, Bureau of Topographic and Geologic Survey  
New Jersey Natural Heritage Program  
Delaware Natural Heritage Program  
Earl Higgins, District Forester, District 17  
Denver McDowell, PGC  
Andy Shiels, PAFBC  
Jenni Farber, PNDI-E

## PENNSYLVANIA NATURAL DIVERSITY INVENTORY

### MANAGEMENT AGENCIES

The statutory authority for Pennsylvania's animals and plants resides with three separate agencies. The Pennsylvania Department of Conservation and Natural Resources has the responsibility for management of the Commonwealth's native wild plants. The Pennsylvania Fish and Boat Commission is responsible for management of fish, reptiles, amphibians and aquatic organisms within the Commonwealth. The Pennsylvania Game Commission has the responsibility for managing the state's wild birds and mammals.

For information on current species status, please consult the appropriate agency. Requests for information should be directed to:

Plants and PNDI - general      Plant Program Manager  
PA Department of Conservation and Natural Resources  
Bureau of Forestry  
Forest Advisory Services  
P.O. Box 8552  
Harrisburg, PA 17105-8552  
(717) 787-3444

#### FISH, REPTILES,

#### AMPHIBIANS,

#### AQUATIC ORGANISMS

Endangered Species & Herpetology Coordinator  
Pennsylvania Fish & Boat Commission  
Bureau of Fisheries and Engineering  
450 Robinson Lane  
Bellefonte, PA 16823  
(814) 359-5113

#### BIRDS and MAMMALS

Pennsylvania Game Commission  
Bureau of Wildlife Management  
2001 Elmerton Avenue  
Harrisburg, PA 17110-9797  
(717) 787-5529

For information on species listed under the federal Endangered Species Act of 1973 occurring in Pennsylvania, contact:

Endangered Species Biologist  
U.S. Fish and Wildlife Service  
315 South Allen Street, Suite 322  
State College, PA 16801  
(814) 234-4090



COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA FISH & BOAT COMMISSION  
Division of Fisheries Management

PO Box 356  
Revere, PA 18953-0356

December 31, 1996

Department of the Army  
Philadelphia District, Corps of Engineers  
Environmental Resources Branch  
Wanamaker Building, 100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Mr. Callegari:

Thank you for the opportunity to review the Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project. In reviewing the sections that pertained to fisheries, I did not find any areas of concern. I was pleased that efforts are being made to follow the blasting schedule established by the Delaware River Basin Fish and Wildlife Management Cooperative to minimize impacts to fish. Likewise, it is encouraging that the project will increase the acres of palustrine emergent wetlands.

Sincerely yours,

Michael Kaufmann  
Area Fisheries Manager

sa!

cc: Fisheries Management Chief R. Snyder  
Environmental Services Chief J. Arway

No response required.

[illegible]

**No response required.**





MARYLAND *Office of Planning*

Parris N. Glendening  
Governor

Ronald M. Kreitner  
Director

January 6, 1997

Mr. Robert L. Callegari  
Chief, Planning Division  
Environmental Resources Branch  
U.S. Army Corps of Engineers  
100 Penn Square East, Wanamaker Building  
Philadelphia, PA 19107-3390

**STATE CLEARINGHOUSE REVIEW**

State Application Identifier: MD961231-1152  
Project Description: Draft Supplemental EIS - Delaware River Main Channel Deepening  
Project (see MD960916-0869)  
State Clearinghouse Contact: Bob Rosenbush

Dear Mr. Callegari:

This is to acknowledge receipt of the referenced project. We are providing notice of the project to State and local public officials via *The Intergovernmental Monitor* for their information.

The applicant is requested to complete the enclosed form and return it to the State Clearinghouse upon receipt of notification that the project has been approved or not approved.

Please be assured that all intergovernmental review requirements have been met in accordance with the Maryland Intergovernmental Review and Coordination Process (COMAR 14.24.04).

Sincerely,

William C. Carroll  
Manager, Plan and Project Review

WGC:BR:mds

Enclosure

The project is not in Maryland, therefore no permits are needed.



MARYLAND *Office of Planning*

Parris N. Glendening  
Governor

Ronald M. Kreitner  
Director

**MEMORANDUM**

Please complete this form and return it to the State Clearinghouse upon receipt of notification that the project has been approved or not approved by the approving authority.

TO: Maryland State Clearinghouse  
Maryland Office of Planning  
301 West Preston Street  
Room 1104  
Baltimore, MD 21201-2365

DATE: \_\_\_\_\_  
(Please fill in the date form completed)

FROM: \_\_\_\_\_  
(Name of person completing this form.)

PHONE: (\_\_\_\_) \_\_\_\_\_  
(Area Code & Phone number)

RE: State Application Identifier: MD961231-1152  
Project Description: Draft Supplemental EIS - Delaware River Main Channel Deepening Project (see MD960916-0869)

**PROJECT APPROVAL**

This project/plan was:

☐ Approved ☐ Approved with Modification ☐ Disapproved

Name of Approving Authority:

Date Approved:

**FUNDING APPROVAL**

The funding (if applicable) has been approved for the period of

\_\_\_\_\_, 199\_\_ to \_\_\_\_\_, 199\_\_ as follows:

Federal: \$ _____	Local: \$ _____	State: \$ _____	Other: \$ _____
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**OTHER**

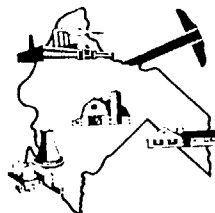
☐ Further comment or explanation is attached

# Salem County Planning Board

96 - 98 MARKET STREET • SALEM, NEW JERSEY 08079

609-935-7510 Ext. 412

FAX: 609-935-8596



William Coles, Chairman

Michael D. Reeves, Director

January 3, 1997

Mr. John Brady  
Environmental Resources Branch  
U. S. Army Engineer District, Philadelphia  
100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390

RE: Supplemental EIS, Delaware River Main Channel Deepening Project

Dear Mr. Brady,

The Salem County Planning Board staff has reviewed the Army Corps of Engineers Draft Environmental Impact Statement on the dredging of the Delaware River shipping channel. Our particular focus was the Salem County site labeled 15G, which is a new disposal site in Oldmans Township on Oldmans Creek, and the continuing use of existing disposal sites in Pedricktown and on Artificial Island. We also focused on more general concerns of groundwater contamination, salt water intrusion, and salinity levels that may affect oyster beds and aquatic life.

Areas of Concern:

## *Site 15G*

The Salem County Planning Board supports your proposal to divide new sites into cells and adopt a rotational disposal cycle that will result in a cell being used only once approximately every five years. We also support other passive steps the ACE has recommended for site management, such as protecting forest stands, creating ponding, and controlling water flow to maintain and/or provide quality habitats. We note the ACE's reluctance to use more aggressive, active steps, such as on-going pumping, due to cost factors. While we are not familiar with the economics of scale, should the ACE decide to pursue pumping, we would have questions regarding pump noise levels and hours of operation. Finally, we do have a concern regarding the preference to let

1. The Corps will not pursue permanent or intermittent pumping to maintain the water levels in the disposal cells, therefore pump noise levels will not be a concern.

2.

nature "reclaim" the dredged site "over time" once it is out of use, rather than the agency taking immediate reclamation steps.

#### *Contamination of Groundwater, Specifically the Pedricktown Site*

3.

Based on ACE modeling and testing, it is stated that the material to be dredged and disposed does not contain any significant levels of contamination. Further, it is estimated that it will take at least 50 years for water to percolate through the dredging and into the wells - with one exception: There is a cluster of wells near the existing Pedricktown site where percolation into the groundwater could take place within several years. However, the ACE's position is that since the dredged material most likely will not contain contaminants, the accelerated percolation will not endanger the groundwater. Are there assurances that the dredged material already disposed on the Pedricktown site does not contain contaminants? Further, is there a plan for well monitoring to ensure safe groundwater supplies at the Pedricktown site?

#### *Salinity Levels:*

Our concern regarding salinity levels is two-fold: 1) the impact of increased salinity levels on oyster seed beds located approximately between River Miles 43 and 50, and 2) the impact of increased penetration upstream of the salinity range.

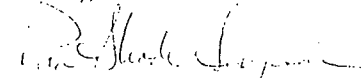
The ACE data indicate the maximum impact on salinity will be a .1 ppt increase, and that this will "not add significantly" to the salinity levels during normal flow, high flow, or record drought. We remain concerned about the delicate balance required to maintain these oyster seed beds, which have been carefully rejuvenated. The window for error is quite small, and there is no indication of the confidence level used in ACE testing models.

4.

The oyster beds between River Miles 43 and 50 are on the edge of the Oligohaline and Mesohaline zones, and we question whether shifting salinity levels and penetration may have a greater impact? The ACE test sites did not appear to include any test data between River Miles 43 and 50, where the zones change at River Mile 46.

The Salem County Planning Board and staff appreciates the opportunity to review the Supplemental EIS report. We commend the ACE for its thorough assessment of environmental issues and recommendations to minimize impacts.

Sincerely,

  
Rita Shade Simpson  
Senior Planner

2. During the life of the project, the wetland cells in the CDFs will be seeded with wetland species and phragmites will be controlled with herbicide, if necessary. This is described in the final SEIS in Section 3.2.3.

3. The cluster of wells near area Pedericktown consists of industrial supply wells for B.F. Goodrich and Monsanto Companies. A groundwater investigation and modeling study of Oldmans Disposal Area was completed by Groundwater Technologies Inc. in 1996. This included the installation of monitoring wells and testing of soil and water. The final report concluded that disposal area operations will not adversely effect the groundwater regime in this area and recommended that the area continued to be utilized as a dredge material disposal site. Pedericktown Disposal area is located adjacent to area 15G and findings from the study cover the surrounding area, including area 15G. Additional monitoring wells will be installed at 15G to monitor this site.

4. The comment references the zone from RM 43 to RM 50 and the oyster resources located therein. Figure 5-9 of the SEIS displays "Zones of Salinity" in the estuary, and indicates RM 46 as the boundary between the downstream Mesohaline (5 - 18 ppt salinity) and upstream Oligohaline (0.5 - 5 ppt) Zones. It is noted that one of the data save locations for the salinity modeling was at RM 43, which is both the southern limit of Salem County and the approximate center of the Mesohaline Zone. RM 50 is adjacent to the south end of Artificial Island. The next model data save point in the upstream direction is at RM 54. Therefore, it can be seen that zone from RM 43 to RM 50 of particular interest to the Salem County Planning Board is effectively bracketed by model data save locations at RM 43 and at RM 54.

In order to put the model-predicted changes in salinity distribution due to deepening into perspective, it is useful to examine the natural range in salinity which occurs within the RM 43 to RM 54 zone over a wide range of time scales, notwithstanding the salinity zone nomenclature referenced in Figure 5-9. Time series of modeled salinity data for each location show the variation of salinity over time scales which include:

- the 12.4 hour tidal cycle - salinity range typically about 3 to 4 ppt at RM 43 and about 4 to 5 ppt at RM 54;
- periods of up to six months - salinity range as much as 10 ppt at RM 43 and 9 ppt at RM 54.
- periods with significantly different inflow regimes - salinity range from below 5 ppt during high-flow to 26 ppt during drought at RM 43 (a range of over 21 ppt), and 0 ppt during high-flow and 17 ppt during drought at RM 54 (a range of 17 ppt).

Reference is made to EIS Tables 5-2 and 5-5, which respectively present salinity range data for a recurrence of the drought of record (July through November 1965) and for the period July through November with monthly averaged inflows. In addition, the simulation presented in EIS Section 5.11.3 documents salinity range data for a recent high-flow period, April to May 1993.

For perspective on the impacts of deepening, it should be noted that at RM 43 and RM 54, the hydrodynamic-salinity model predicts that even the largest salinity change induced by deepening is less than 1 ppt, with most changes typically in the range of 0.1 to 0.5 ppt. It is the view of the District that the large, natural variability of salinity at essentially all locations within the estuary renders the changes associated with deepening and sea level rise essentially a negligible environmental impact.

Please also refer to New Jersey Responses 36, 37, and 38.

COUNCIL 322-9801

H. Thomas McGuire  
President

William G. Blest  
Chair person, Parks/Recreation  
& Buildings Committee

Genevieve I. Miller  
Chair person, Finance Committee

Pasquale J. Marinelli  
Chair person,  
Street Committee

Albert J. Vannucci, Jr.  
Chair person,  
Police Committee



FAX: 322-9814

MAYOR 322-9802

John F. Klingmeyer

CITY CLERK 322-9804  
Darlene A. Sweetman

CITY TREASURER  
Thomas E. Leonard

Mayor & Council of New Castle / 220 Delaware Street / New Castle, Delaware 19720-4816  
December 230, 1996

Mr. Robert L. Callegari  
Chief, Planning Division  
U.S. Army Corps of Engineers  
Philadelphia District  
Environmental Resources Branch  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390

Ref: Public Notice #CENAP-PL-E-97-01

Dear Mr. Callegari:

On behalf of the City of New Castle, we wish to recognize receipt of the referenced notice. The information will be posted and comments will be forwarded to you by February 17th if there are any.

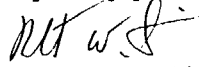
In reviewing the list of Libraries where "The Draft Supplemental Environmental Impact" was sent, we noticed that the local Library in New Castle was omitted. Would you kindly send appropriate information to:

New Castle Public Library  
5th and Delaware Streets  
New Castle, DE 19720

Thank you for your attention.

Happy Holidays!

Very truly yours,

  
Robert Wm. Martin,  
City Administrator

RWM:jw

cc: Mayor and Council (via clip)  
Ms. Sally Brown, Librarian

Callegari, Pub

1. Two copies of the draft SEIS were sent to the New Castle Public Library on December 30, 1996.



**BOROUGH OF CAPE MAY POINT**

POST OFFICE DRAWER 504  
CAPE MAY POINT, NEW JERSEY 08212  
(609) 884-5603

TELECOPIER  
(609) 884-1732

Malcolm C. Fraser  
Mayor

Craig Pilczuk  
Commissioner

James Handley  
Commissioner

January 3, 1997

U.S. Army Corps of Engineers  
Philadelphia District  
Wanamaker Building  
100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390


Attention: Robert L. Callegari, Chief  
Planning Division

Subject: Delaware River Main Channel Deepening Project  
Policy Notice: CENAP-PL-E-97-01

We have reviewed subject Environmental Impact Statement and question why some of the 33.4 million cubic yards of dredged material couldn't be delivered to the offshore area of the Borough of Cape May Point. Our St. Peters Beach and Cape Beach are currently under attack and washing out. These two beaches are at the corner of the Cape May peninsula. 60,000 cubic yards would do wonders in holding the fort until the Army Corps South Meadows Project construction gets underway just after the turn of the century.

Cape May Point appears to lie closer to your dredged area than either Slaughter Beach or Broadkill Beach in Delaware. 60,000 cubic yards is less than 0.2% of your projected dredged sand. RSVP.

Respectfully,

  
M.C. Fraser, Mayor

cc - Carmen Zappile, Army Corps Engineers, Philadelphia  
Congressman Frank LoBiondo  
Borough Commissioners

The project economic benefit analysis indicated that the least cost option is to place the sand material at the selected sand stockpile sites for future beach nourishment.



COUNTY OF CUMBERLAND  
DEPARTMENT OF PLANNING AND DEVELOPMENT  
800 EAST COMMERCE STREET  
BRIDGETON, NEW JERSEY 08302

(609) 453-2175  
FAX 453-9138

STEPHEN L. KEHS, AICP  
EXECUTIVE DIRECTOR

January 22, 1997

Mr. Robert Callegari, Chief  
Planning Division  
Environmental Resources Branch  
U.S. Army Corps of Engineers  
100 Penn Square East  
Philadelphia, PA. 19107-3390

Re: Delaware River Main Channel Deepening Project

Dear Mr. Callegari:

My office has reviewed with great interest, the environmental impact statement associated with the Channel Project for the Delaware River. The proposals for wetlands restoration that will reduce erosion along the Bay are commendable and will probably enhance the environmental integrity of the area as habitat for a variety of plant and animal species.

We would like to make a suggestion, however, for another "beneficial use" site where the sandy, dredge material can provide important public benefits. As you know, Fortescue village in Cumberland County is one of the largest Delaware Bay communities. It is home to the New Jersey State marina and a sizeable fishing and recreation industry. One of the interests of local citizens has been the restoration of the beach in Fortescue which used to be very large. Beach restoration would enhance areas for horseshoe crab migration, shorebird habitat, and human use. Beach improvements would also provide a shot in the arm for the development of the tourism industry and redevelopment of the village in general.

In your environmental impact statement, you mention the proposed stockpiling of 4.7 million cubic yards of material off the coast of Delaware for future beach restoration projects. We would like to suggest that this material be dedicated to restoring the beach at Fortescue. There are new and innovative techniques in use today that help to prevent the erosion of newly restored beaches. The development of this project would be a significant investment in the future of a community that is looking for innovative ways to enhance its economy and protect its critical environmental resources. (see attached ecotourism plan.)

I hope you will consider this suggestion and move quickly to bring it to the table. It appears that this opportunity may be the only way to make such a beach restoration project affordable to a

As part of our analysis, consideration was given to placement of sand material at Fortescue. However, the project economic benefit analysis indicated that the least cost option is to place the sand material at the selected sand stockpile sites for future beach nourishment.

small community such as Fortescue. My office will gladly work with you to assemble the appropriate plans, educational materials, and other information needed to make this project a reality.

Thank you for your consideration and your continuing interest in Cumberland County. Please let me know how we can proceed with this effort.

Sincerely yours,



Stephen L. Kehs  
Director

cc. Senator Frank Lautenberg  
Senator Robert Toracelli  
Congressman Frank LoBiondo  
Mayor Harry Wilson, Downe Township

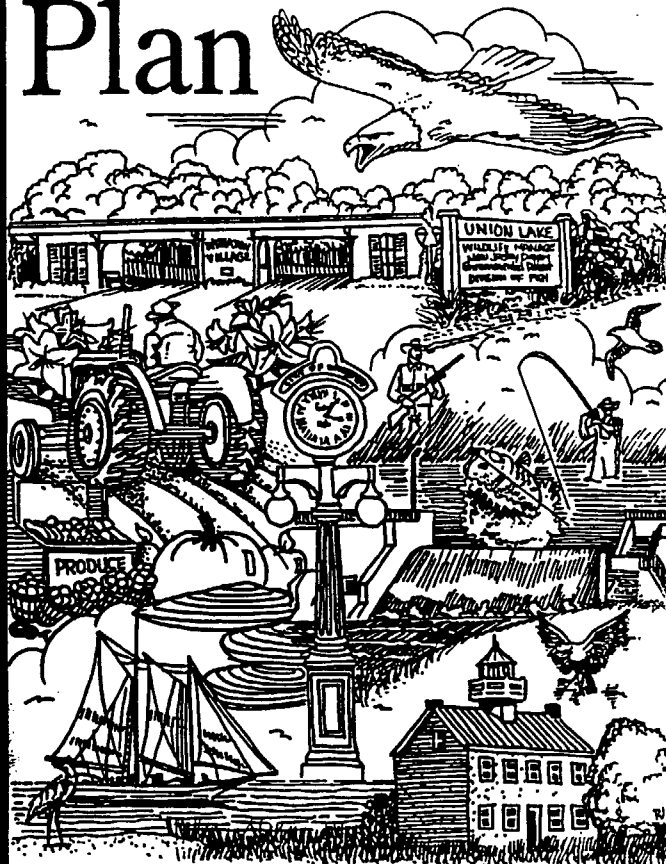
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Cumberland County

# Ecotourism Plan



A Vision & Implementation  
Strategy For Economic  
Development & Conservation

## EXECUTIVE SUMMARY CUMBERLAND COUNTY ECOTOURISM PLAN February 1996

### Introduction

Ecotourism is a new concept. It affords visitors the opportunity to enjoy the natural resources and environment of an area without destroying them. It is easy to include all types of tourism under the umbrella of ecotourism but in the Cumberland County Plan, ecotourism includes only those activities with a direct link to the natural environment.

It is due in part to the dichotomy in Cumberland County between the need to preserve outstanding natural resources while also promoting jobs and a healthier economy that many of the County's businesses and citizens became interested in ecotourism. In November of 1993, County government hosted an ecotourism workshop at the Brian Parent Center in Millville that began to frame some key issues to be included in an ecotourism plan for the County. Cosponsored by the South Jersey Land Trust, this workshop focused on seven topics that defined ways that government, the private sector, the non-profit agencies, and citizens could promote an ecotourism program in Cumberland County. They included the following themes: *Making Ecotourism Work for Local Business; Managing Natural and Human Resources in an Ecotourism Program; Identifying Investment Needs for a Sound Ecotourism Program; Making Ecotourism Part of a Regional Tourism Program; Identifying Present and Future Ecotourism Attractions; Marketing an Ecotourism Strategy for Cumberland County; and Assistance from Conservation Agencies.*

This Plan builds on the findings of that workshop. It includes ideas developed by the County Planning Board and staff, and also includes concepts from other ecotourism efforts around the County, region, and nation.

### Tourism and Ecotourism Today

According to the New Jersey Division of Travel & Tourism, the tourist industry is the major component of the State's economy. It accounts for more than \$17 billion in revenues. In Cumberland County, that figure is much more modest. More than \$100 million was generated from sales in restaurants, lodging, and recreation. This figure is small compared to Atlantic and Cape May Counties, where tourism generated billions of dollars.

There are many examples of "ecotourism" in the region, although it is not always called that. Cape May County has a very prosperous birding industry. More than \$10,000,000 is spent in Cape May County annually by birders. Bucks County, Pennsylvania recently began promoting its natural resources in a document entitled "Eco Adventures -- Escape to the Nature and History of Bucks County, Pennsylvania's Perfect Getaway." The New Jersey Divisions of Travel & Tourism; Fish, Game, & Wildlife; and Parks & Recreation all publish excellent documents promoting a variety of outdoor experiences.

The private sector and non-profit organizations in Cumberland County have also been active in ecotourism. The Nature Conservancy and the Natural Lands Trust are promoting ecotourism on their properties. The Delaware Bay Schooner Project is sponsoring many educational and natural resource experiences. Public Service Electric & Gas has taken an interest in the concept through its Estuary Enhancement Program. Restaurants and gift shops are promoting river cruises and special lines of apparel.

There are not many places, however, that have developed plans to promote and manage ecotourism. A couple communities in North Carolina have assembled plans. There is an effort on the island of Kaua'i, Hawaii to advance this concept in a planned way. While there may be other examples, they were not located. These plans focus on several key themes: an inventory of resources, a marketing and development program, resource management strategies, and public involvement.

#### **Making a Transition to a Comprehensive Ecotourism Strategy for Cumberland County**

The 1993 workshop provided the County with an excellent start toward assembling a plan. It introduced the concept of ecotourism to a broad cross-section of the community. It generated many good ideas and created a lot of enthusiasm. Yet the workshop focused on themes and concepts which needed to be put into a general planning framework, as well as detailed strategies and recommendations. Toward this end, the County Planning Board established several tenets that members felt should be part of the plan. First, the plan should focus on ecotourism themes that could be developed in the County. Second, the unique destinations in the County that could be promoted should be identified. Third, the plan should contain a good public involvement effort. The County Planning Board recognizes that ecotourism is not for everyone. It will be welcomed in some areas and not in others. With these broad tenets in mind, the County Ecotourism Plan focuses on six general themes and four special places where ecotourism could be promoted and developed.

#### **Cumberland County's Ecotourism Themes and Places**

Each of the themes and places identified in the Plan has a range of development, marketing, and resource preservation needs. The Plan discusses those needs in detail and makes various recommendations. The presentation that is part of this Executive Summary is only an outline of that information.

#### **Themes**

##### ***Tracing the County's Maritime Heritage***

Cumberland County was founded by seafarers. Many of the early towns and villages of the County built the sloops and schooners that carried raw materials to market in Philadelphia and other urban areas. There are many resources in the County that tell of this maritime heritage. Boat yards, maritime museums, old schooners and villages, lighthouses, boat builders, and river tours could all be tied together as part of a package to promote this theme. Many of these resources, however, have limited or no public access. Facilities such as parking areas, rest rooms, and good signage are lacking. Consequently, it will take time to market this theme and build business enthusiasm for it. Only certain resources, such as the Delaware Bay Schooner Project, could be marketed right away.

#### ***Boating Adventures in Cumberland County***

For many years, Cumberland County has had some of the best boating opportunities in the region. Recreational boating on the Maurice and Cohansy Rivers is popular. Boating on the Bay and some of the smaller streams and creeks are common pastimes. There is a State marina at Fortescue and many private marinas line the waterways of the County. These opportunities can easily be included in County promotional material. Some promotion is already occurring. The principal issue associated with this theme involves resource protection. Ensuring that the waterways are not overused is important for the existing marinas, businesses, and the environment. Educational material stressing the proper use of these resources is important.

#### ***Premier Fishing, Hunting, Crabbing, and Trapping Opportunities***

There are fifteen (15) State owned natural areas in Cumberland County. Some of them are more accessible than others. Some can sustain only limited accessibility. The Plan outlines those areas where additional infrastructure might be needed to advance hunting, fishing, and crabbing opportunities. The Bevan, Peaslee, and Heislerville Fish & Wildlife Management Areas may be able to sustain greater levels of public access. The smaller F&WMAs along the Bay shore may not. Nonetheless, there are a wide variety of potential improvements that can enhance fishing and hunting in Cumberland County.

#### ***The Heart of Farming in the Garden State***

Cumberland County is the number one producer of agricultural commodities in New Jersey. The heritage of the farming industry is a long and varied one. But farming is more than just a pretty landscape. It represents one-third of the county economy as well. By comprehensively marketing the roadside stands, "pick-your-own," and other farming operations in the County, the agricultural industry and the farm lands can be protected. Farm vacations are increasingly popular ways to experience farm living. They also provide a 10 to 30 percent increase in farm income. (*American Agriculturalist*, September 1995). This is clearly a natural resource theme in Cumberland County that could be promoted as part of an ecotourism program.

#### ***Birding, Biking, and Hiking: Passive Recreation***

Cumberland County has a spectacular array of bird life. The migration of shore birds is unrivaled in the continental United States. Raptors, songbirds, and water fowl are prominent among the bird species of the County. In Cape May County, birding is a big business. Approximately \$10 million dollars is spent annually by birders visiting the County. The construction of boardwalks, nature trails, and observation platforms can help to enhance the birding industry in Cumberland. The Nature Conservancy has been a leader in promoting this effort. The Natural Lands Trust has excellent facilities at its "Glades" refuge in Downe Township. PSE&G, as part of its Estuary Enhancement Program is also developing these types of facilities. By promoting this development on non-profit and State owned lands, the birding theme is one that can be easily and effectively marketed. Biking and hiking facilities are lacking, however. There are very few trails where biking and hiking can occur in a well managed and safe environment. These opportunities need to be developed.

### *Glass Making and Silica Sand*

Wheaton Village does an outstanding job telling the history of glass in Cumberland County. The Village attracts more than 60,000 visitors annually and generates an estimated \$8,000,000 in the County economy. This story would be enhanced significantly if the history of the natural resource could also be told. The rich silica sands found in the County are the reason the glass industry got its start here. A heritage museum that explains the many uses of silica sand and makes a connection to the glass industry would be a fine attraction for inclusion in an ecotourism program.

### **Places**

#### *Cumberland County's Wild & Scenic Rivers*

Portions of the Maurice River and its tributaries were included in the National Wild & Scenic River system in 1993. These waterways are spectacular examples of unspoiled rivers particularly since they are located in the most urbanized State in the nation. There are very few public facilities along the rivers that enable people who do not own land there to enjoy the resource. A conservation plan is already in place for these waterways. The Ecotourism Plan recommends the development of such things as welcome centers, interpretive loops, and park development to enhance the visitor experience to this area.

#### *Port Norris and New Jersey's Oyster Industry*

In the late nineteenth and early twentieth centuries, Port Norris was the "Oyster Capital of the World." While this home grown description may have been a slight exaggeration, settlers as early as the 1700s recognized the rich harvest in oysters that could be found in the Delaware Bay. Many of the remnants of this once thriving industry still exist in the Port Norris area. Oystermen, oyster boats, and oyster shucking houses can still be found there. The Delaware Bay Schooner Project, through the restoration of the *A.J. Meervald*, and Commercial Township officials have been leading proponents of a revitalized waterfront in Shellpile and Bivalve. The Schooner Project has plans to restore many of the old shipping sheds along the Maurice River. In conjunction with tours, trails, and special events such as Bay Day, the Port Norris area should be a significant focus of the County's ecotourism efforts.

#### *The Maurice River Natural Resources Center*

For almost a year now, officials from Maurice River Township, the County, and the N.J. Division of Fish, Game, & Wildlife have been discussing publicly the development of a major, state-of-the-art Natural Resources Center in the Township. The proposed Center would be an educational facility that would allow visitors from all over the world to understand and appreciate the resources of the Maurice River and Delaware Bay regions. Funding for this Center is being discussed through State, private, and non-profit grant sources. This facility would be a tremendous attraction, the spin-off effects from which would enhance retail, service, and other tourism businesses in the area.

#### *Bridgeton, Millville, and Vineland: Ecotourism Destinations Too!*

Much of what is presented in the Ecotourism Plan deals with the rural economy -- nature walks, bed & breakfast facilities, fishing, boating, and recreation. But, the cities of the County are where most

of the services are. Gas stations, motels, restaurants, and various other shops are located throughout the downtowns of the County's urban areas. Chambers of Commerce are available to promote the connections of local business to ecotourism opportunities.

### **Implementing the Plan**

Developing the Ecotourism themes and places in this Plan will take time. It cannot, should not, and will not happen overnight. There are roles for the public, private, and non-profit sectors to play in this process. Here are more than 90 ideas that can move an ecotourism program forward.

#### *38 Things County and Local Government Can Do*

1. *Conduct Market Studies.* Provide the documentation that encourages the private sector to invest in these concepts.
2. *Promote Innovative Wastewater Treatment Concepts.* Wastewater management is necessary if the rural towns and villages are to redevelop.
3. *Develop a Targeted Loan Program.* Provide low interest loans to ecotourism businesses.
4. *Clean up Key Ecotourism Sites.* Litter in the more remote rural areas is a big problem.
5. *Organize Special Events and Festivals.* Good examples already exist. The Commercial Township Seafood Festival, the Peaches N' Cream Festival at Dutch Neck Village, Weakfish Tournaments, Vineland Azalea Festival, and so forth all fit into an ecotourism theme.
6. *Prepare Promotional and Marketing Material.* An ecotourism guide could consolidate many of the themes and places highlighted in the Plan.
7. *Develop an Ecotourism Logo.* This logo could be featured on publications, products, and other material that promotes a Cumberland County ecotourism theme or place.
8. *Erect Signage.* Getting people to and from the ecotourism sites is important.
9. *Establish an Ecotourism Advisory Committee.* Oversight and coordination of the program are necessary. There are many ways this can be done. An advisory committee could help advocate for ecotourism investments.
10. *Improve Access to Ecotourism Sites.* Road access and public facilities are needed at almost all the existing or proposed ecotourism sites.
11. *Training and Education.* Everyone from the local resident to the business person or public official must be sensitive to the needs and wants of the prospective visitor if an ecotourism program is to be successful. Education and training can help advance the awareness of the resource base and provide the technical, business, and vocational skills necessary to compliment the program.
12. *Park Development.* There are currently no managed state or county parks in Cumberland. Through partnerships with the State or the non-profit agencies the development of a State or County Park could enhance ecotourism efforts and provide another great destination.
13. *Amend local Ordinances.* Local plans and land use regulations must accommodate ecotourism needs and facilities.
14. *Code Enforcement.* Keep the community clean and attractive.
15. *Educational Material.* There is a code of ethics that ecotourists and ecodevelopers should follow. Be sensitive to the natural resource base. Design with nature.
16. *Produce a Funding Guide.* Such a publication could list funding sources for prospective ecotourism developments and projects.

17. *Sponsor Workshops.* Business planning, design, community development are all important issues that can be topics of workshops.
18. *Establish a Non-Profit Development Corporation.* In conjunction with non-profit conservation groups, chambers of commerce, businesses and other organizations, the County should consider creating a non-profit corporation to finance ecotourism development.
19. *Establish a Databank and Network.* Making the right linkages and connections will be important to advancing an ecotourism program.
20. *Prepare Maps of Self-Guided Tours.* These maps and audio cassettes would help visitors appreciate the themes and places highlighted by the Plan.
21. *Promote Development of an Urban Market.* An urban farm market that would highlight the cultural and ethnic diversity of the County could be a big redevelopment tool for an urban downtown. By bringing more visitors to the area, the market for farm produce stands across the County would be expanded. This facility would also make a direct ecotourism link between urban and rural interests.
22. *Develop Bike and Pedestrian Trails.* On County, non-profit, or State owned lands, bike and hiking trails would be important ecotourism amenities.
23. *Connections to the Region.* The County should begin to market ecotourism experiences to major tour operators throughout the region.
24. *An Ecotourism Calendar of Events.* This would link and coordinate activities and facilities.
25. *Resource Protection Measures.* Ideas such as establishing a conservation foundation to accept gifts of lands; continuing the farm easement purchase program; providing local planning assistance; preparing an owner's guide to resource protection; and promoting stream conservation will all help to protect the natural resource base of the County.
26. *Provide an Avenue for Conflict Resolution.* Working together and pulling in the same direction helps make the most of financial and other resources.
27. *Monitoring and Evaluation.* The County should identify some benchmarks which will help to monitor the success of an ecotourism program.
28. *Restroom and Visitor Facilities.* These are obviously important facilities that need to be developed as part of a comprehensive ecotourism program. Perhaps public buildings could provide these services until new facilities are constructed.
29. *Regional Connections to Natural Resource Experts.* Organizations such as New Jersey Aquarium, the Philadelphia Zoological Society, the Audubon Society, and the N.J. Conservation Foundation can provide good technical expertise.
30. *Connections to the New Jersey Coastal Heritage Trail.* This trail, promoted and managed by the National Park Service, provides excellent connections to the ecotourism attractions of the County.
31. *Labor Force Training.* Fitting the ecotourism industry to the skills of the local labor force is an essential part of building the industry.
32. *Identify Stakeholders and Public Involvement Process.* Citizen, business, and general public involvement in this Plan is essential to making it work.
33. *Walking Tours of Glass Architecture.* There are many homes, shops, etc. with outstanding glass windows and doors that were manufactured in the County. Walking tours of the downtowns could point out these interesting sights and enhance the awareness of the glass and silica industries.
34. *Canoe Trails.* Illustrate the best self-guided canoe trips through maps or brochures.
35. *Municipal Flyers on Ecotourism.* Municipalities should be encouraged to develop their own promotional material on ecotourism. Some Cumberland County communities are doing this now.

36. *Organize a Cumberland County Guide Association.* This organization would offer certified training in hunting, fishing, crabbing, boating, and other ecotourism experiences.
37. *Publish a Directory of Sporting Clay Ranges.* These facilities can draw a number of sports enthusiasts to the County and region.
38. *Mosquito Control.* Targeted sites should be part of the County's mosquito control areas.

### 30 Great Ideas for Local Business

1. *Promote and Develop Aquaculture.* Aquaculture can be an important part of the farming industry. It can also be an interesting site for tourists.
2. *Develop a Campground.* There are few traditional tenting, or low impact campgrounds in Cumberland County.
3. *Crab & Cook Days.* Give people the chance to go crabbing and have their catch cooked at a local restaurant.
4. *Canoe Cruises.* This is canoeing with a gourmet touch. Gourmet meals could be provided as part of a canoeing adventure in the area.
5. *Use of Ecotourism Logo.* Once it is developed, the business community could use the logo to promote its ecotourism products or services.
6. *Package Tours.* Private operators are needed to make the connections with business, industry, and other potential providers of ecotourism sites and services.
7. *Silica Heritage Facility.* A museum or heritage facility for the silica sand industry. This facility could tell the story of glass sand in Cumberland County, offer tours, etc.
8. *Bed & Breakfast Houses.* Create a B&B in your own home!
9. *Kayak the Delaware Bay Wetlands.* There are almost a limitless number of streams, guts, and waterways to explore along the Delaware Bay coast.
10. *Establish an Ecotourism Travel Center.* An agency is needed to specialize in County ecotourism adventures.
11. *Fee Fishing.* Old sand washes and other ponds and lakes might provide profitable fee fishing locations. Land owners or municipalities could make money doing this.
12. *Market local products with Ecotourism Themes.* There is a line of clothing being marketed with a Delaware Bay theme.
13. *Farm Vacations.* Through the County Agriculture Development Board and the Board of Agriculture, this concept should be explored.
14. *Bird Watching Tours.* Find new and better ways to capitalize on birders who are already coming to the County but not spending enough money!
15. *Nature by Night.* Exploring nature at night brings out a new set of sights and sounds. Tours could be arranged to star gaze or just enjoy the "night life."
16. *Bay Burgers, Maurice River Crabcakes, and Greenhead Pies!* Develop and market a line of food with local ecotourism themes.
17. *Ballooning the Delaware Bay and Marshlands.* There are many large facilities and air fields in the region that would provide opportunities for these types of tours.
18. *Lighthouse Holidays.* Dress the lighthouses up for the holiday season.
19. *"Rail - Bird Excursions."* This would take some investment, negotiation with the railroad, and some serious insurance coverage, but touring natural areas by rail would provide an interesting trip and provide alternative access to many of the remote areas in the County.

20. *Work on A Fishing Boat.* If farm vacations are for real, why not promote the chance to help catch and clean fish?
21. *Provide Better Land Connections for the Boating Public.* For people visiting the area by boat, there are very few places where they can find a day-slip, step onto land, and visit some of the other tourism destinations in the area.
22. *Aquatic Tours.* Whale watching, lectures on aquatic life, or even bird watching by boat could provide alternative sources of income for charter fishermen and other boaters.
23. *Clam Shucking.* Combining this experience with a dinner or river cruise could provide an interesting tour package and fun for the day.
24. *Boat Building Classes.* Learn the craft from a vanishing breed of artisans.
25. *The World's Largest Sandbox.* A novelty for kids and adults. Build sand castles or just play in a big pile of sand! Good idea for an area with plenty of the natural resource.
26. *Electric motor boats in Sunset Lake.* Tour some of the natural areas in the County in a craft that is not as demanding as a canoe.
27. *Develop a Model Farm.* In conjunction with the 4-H and other groups a model farm could highlight some of the agricultural assets of the County.
28. *Lighthouse Tours by Boat.* There are more lighthouses in the Delaware Bay than the Ship John and East Point Lights. Tours by boat would give people a chance to see and photograph these interesting structures.
29. *Enhance the Holly Theme.* Holly farming can be interpreted as an important part of the region's farming history.
30. *Crab Pins and Other Products.* Pins and jewelry honoring the venerable horseshoe crab or other ecological symbols could help promote the region's ecology and economy.

#### *Ways the Federal and State Agencies Can Help*

1. *Develop the Wildlife Management Areas to Provide Better Ecotourism Opportunities.* Access and other public facilities are necessary if these areas are to serve more effectively as attractive fishing, crabbing, and boating destinations.
2. *Construct a Natural Resource Center in Maurice River Township.* Discussed previously.
3. *Protect Delaware Bay Coast.* The undeveloped reaches of the Delaware Bay Coast provide habitat for many types of animals. These habitats form the natural resource base for an ecotourism program.
4. *(State) Park Development.* In conjunction with the County or local government, some of the larger government agencies can help to fund park development in Cumberland County.
5. *Providing Ecotourism Literature.* State agencies can help to package literature that promotes that county and other regions of the State as ecotourism destinations in a coordinated way.
6. *Beach Restoration.* Enhancing the beaches of the Delaware Bay shore can provide a boost to both tourism and shore bird habitat.
7. *Maurice River Dredge and Erosion Control Project.* The mouth of the Maurice River needs to be dredged and the banks stabilized. This is important from both a habitat, cultural, and economic perspective.
8. *Develop Coastal Heritage Trail.* Work with the National Park Service to add Cumberland County sites to the Trail.
9. *Streamline Regulation.* This is important if the public facilities and amenities are to be provided that can complement an ecotourism program.

10. *Develop Welcome Centers.* Welcome Centers in the County would help draw ecotourists and other visitors to the region.
11. *Implement the Watchable Wildlife and Teaming with Wildlife Programs.* These programs, being developed by the State, can provide well managed and funded interpretive experiences.
12. *Protect the Horseshoe Crab.* This venerable creature is being overharvested. It provides the source of food for millions of migrating shorebirds and needs to be managed.

#### *The Non-Profit Agencies and their Roles in Ecotourism*

Traditionally, the non-profit conservation organizations have been concerned only with environmental preservation. They have acquired land for permanent protection but have not gotten into the economic side of the preservation equation. This perspective is changing through ecotourism. There are several ways that non-profit groups can help.

1. *Act as Regional Marketing Advocates.* For example, The Nature Conservancy is an international organization that can help to market the Delaware Bay region. Other groups have contacts around the nation that can help to promote ecotourism in the area.
2. *Organize a Volunteer Pool.* Managing an ecotourism program will be a full-time job. Volunteers can help to staff events, sites, and manage land and property.
3. *Develop Sites as Ecotourism Destinations.* Many of the sites owned in Cumberland County are being transformed into sites for hiking, bird watching, and other ecotourism activities.
4. *Work to Create a Non-Profit Development Corporation.* Assistance to the County and the business community can help promote a non-profit development corporation that can provide alternative types of funding opportunities.
5. *Host Public Information Meetings.* Many times, the actions of non-profit agencies can have significant community impacts that need public discussion. Citizens should be invited to be part of the non-profit agenda.
6. *Partners in Management.* Non-profit organizations can be partners with the State, County, and municipalities in managing lands set aside for conservation.
7. *Comprehensive Ecotourism Advocates.* Funding, permit streamlining, land management, marketing, dealing with payment-in-lieu-of-taxes, and facility development are all important aspects of a comprehensive ecotourism program. Non-profit organizations can be advocates for more than just land conservation.
8. *Field Trips and Interpretive Experiences.* The Non-profit groups can be links to other organizations in the development and implementation of various types of field experiences.
9. *Native American Interpretive Opportunities.* Native American history and culture can play an important role in explaining the use of nature's products in medicine, wood crafts, hunting, and other aspects and traditions of the area.

#### *Establishing Priorities*

It is very important that an ecotourism program be developed in a way that serves the local community first. Cumberland County residents should be able to enjoy the fishing, boating, and other recreational assets of a well planned ecotourism program. *Ecotourism is not just for the tourists.* With this in mind, many of the nature trails, park facilities, boardwalks, and other amenities that would

serve the local community should be developed first. Some of these facilities are also the easiest to fund and implement.

County officials should also discuss ways to coordinate the development of the ecotourism program. Several recommendations have been made. Either through a special ecotourism committee, the existing Tourism Advisory Council, a non-profit development corporation, another existing agency, or some combination of these options this coordination must be provided.

Marketing the ecotourism assets of the area must begin slowly. It must be phased in to accommodate new attractions and events as they are developed. Initially, a county marketing effort could focus on birding, recreational boating, the Schooner Project, selected maritime sites, selected hunting and fishing experiences, farm produce stands, the story of glass, and special events such as Bay Day, the food festivals, and various other ecotourism activities.

In the long run, the Maurice River Natural Resource Center, the redevelopment of Port Norris/Shellpile/Bivalve, an ecotourism business development program, park development, a comprehensive marketing package, public access improvements, and resource protection efforts are of paramount importance.

#### *Summary*

Ecotourism is here. It is happening today in Cumberland County. Small businesses, non-profit organizations, and various governmental agencies are all exploring ecotourism themes and activities. To expand on this progress, it is essential that the lines of communication between business, government, citizens, and non-profit organizations are kept open. It cannot be emphasized enough that in an era of declining Federal and State dollars, ecotourism activities must be coordinated so there is as little duplication of effort as possible. The promise of ecotourism depends on business, environmental groups, non-profit organizations, government, and citizens working together.

Ecotourism is not the answer to all of Cumberland County's economic problems. It is one answer. It is one way to expand the economy, create jobs, and protect the natural resource base that is so important to the area's quality of life.

Ecotourism in Cumberland County must always be viewed in its historic context. It was born out of a need to find a common agenda; one that would provide both economic development opportunities and preserve the County's natural heritage. That is the mission of this Plan.

Robert L. Callegari  
Chief of Planning  
U.S. Army Engineer District, Philadelphia  
Wanamaker Building  
100 Penn Square East  
Philadelphia, Pa 19107-3390



Dear Mr. Callegari,

The Oldmans Creek Watershed Association is requesting a public hearing in reference to the Delaware River Main Channel Deepening Project Draft Supplemental Environmental Impact Statement (SEIS). It is our opinion that the public in both Salem and Gloucester Counties in New Jersey were not given sufficient information regarding the project to allow them to comment within the allotted time period. There is only one source of information regarding this report for the entire two county area, that being Rowan College in Glassboro, Gloucester County New Jersey. No repositories for Salem County were listed in the SEIS.

Salem and Gloucester Counties will be receiving 89 % of the dredged material, over 286 million cubic yards, at eleven sites over the life of the project. The remaining dredged material will be located at one site in Cumberland County, New Jersey, five sites in Delaware, and at a submerged site at buoy 10. Although there are no disposal locations in the entire state of Pennsylvania, sixteen libraries there received copies of the draft SEIS. Only two of the eight New Jersey libraries receiving the report are located in counties that will be directly impacted by the dredging.

Since the burden of the dredge material is being placed mainly on Salem and Gloucester Counties so should the information regarding this project. The courtesy of a response is requested.

Elaine DuBois  
Secretary Oldmans Creek Watershed Association

Ms DuBois was called and a copy of the DSEIS was sent to her, at her request, on February 12, 1997. In addition to the eight libraries in New Jersey that were initially sent copies of the SEIS, the following six libraries in New Jersey were sent copies on February 12, 1997:

LIBRARY

Elmer Public Library  
Carneys Point Library  
Woodstown-Pilesgrove Library  
Swedesboro Public Library  
Paulsboro Public Library  
James Johnson Memorial Library

COUNTY

Salem  
Salem  
Salem  
Gloucester  
Gloucester  
Gloucester

Mr. Robert Callegari  
Chief of Planning  
U.S. Army Corps of Engineers, Phila. District  
Wanamaker Building  
100 Penn Square East  
Philadelphia, Pa 19107-3309

February 8, 1997

Dear Mr. Callegari,

The Oldmans Creek Watershed Association has previously requested a public hearing to discuss the Delaware River Main Channel Deepening Project. This memo details our questions, comments and concerns with the Project's Draft Supplemental Environmental Impact Statement. We would like to restate our request for a public hearing to address these issues.

1. **Page 1-3** States that no additional testing or remediation of the CDF's is required because the NJDEP standards were only minimally exceeded. We are concerned that the property owners of these dredge sites are not being held to the cleanup standards set forth by the State of New Jersey.
2. **Page 1-4** States that a cluster of wells near 15G will be impacted in a relatively short time. Given that we know the arsenic levels found in soil at that location exceeds NJDEP direct soil cleanup, that Thallium and Toxaphene levels in the dredge samples exceeded NJDEP direct soil cleanup, that cadmium levels are very close to cleanup standards how can you allow the continued use of these wells with no monitoring?
3. **Page 1-9** The shellfish survivability modeling was performed with set criteria. When oyster survivability was effected the criteria used to perform the test was dismissed as not being representative of what was likely to occur. This is not accepted scientific procedure.
4. **Page 1-28** Regarding the potential effects on humans: wells in the vicinity of 15 G will be impacted in several years, aesthetics certainly will be negatively impacted as we will have seven 100 foot sludge mountains 275 acres wide in Salem and Gloucester Counties.
5. **Page 2-6** States that with dike improvement the federal sites of Oldmans and Pedricktown North and South can receive an additional 36.5 million cubic yards of dredge. The chart on page 3-7 shows these sites as receiving over 57.5 million cubic yards. How do you account for this discrepancy of over 21 million cubic yards?
6. **Page 2-13** States that this plan will preclude ACE from purchasing another disposal site. However, as stated before, there is a significant amount of material (21 million cubic yards) that is not being accounted for. Where will it be placed?
7. **Page 3-3** Maintenance of the deepened channel is stated to produce 6 million cubic yards per year of dredge material. Based on a 50 year maintenance, as stated, there would be over 300 million cubic yards generated. Table 3-2 only accounts for disposal of 289 million. Where will the remaining 11 million cubic yards be placed?
8. **Page 3-3** States benefits are based on maximum utilization of the channel and utilization at high tide. Would benefits be more accurately determined by average utilization?
9. **Page 3-6** Table 3-1 is missing approximately one million cubic yards of dredge material. Values in reach E do not add correctly.
10. **Page 3-7** The placement of 15-G and 15-D in table 3-2 is different than previous chart. Are the associated quantities correct?
11. **Page 3-8** Table 3-3 Needs to be clarified. It does not adequately show the sites that will be receiving the initial dredge material.



In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives

1. The sponsor of this project is being held to all State of New Jersey standards. During the pre-construction phase, Plans and Specifications, additional testing at the proposed dredging sites will be performed in areas of concern, to ensure that potentially contaminated soil is identified. Any soil found to exceed the regulatory levels will be removed prior to construction of the disposal sites.

2. The cluster of wells near area 15G consists of industrial supply wells for B.F. Goodrich and Monsanto Companies. A groundwater investigation and modeling study of Oldmans Disposal Area was completed by Groundwater Technologies Inc. in 1996. This included the installation of monitoring wells and testing of soil and water. The study concluded that disposal area operations will not adversely effect the groundwater regime in this area and recommended that the area continued to be utilized as a dredge material disposal site. Oldmans Disposal area is located adjacent to the proposed area 15G and findings from the study cover the surrounding area, including area 15G. As discussed in the SEIS, the mean concentration of thallium is elevated because of the high quantification levels achieved in the first round of sampling. In two subsequent rounds of sampling, 40 additional sediment samples show that the actual concentration of thallium in channel sediments is less than 0.4 ppm, which is well below the NJDEP Residential Surface Soil Standard of 2.0 ppm. Toxaphene was not detected in any of the 153 sediment samples analyzed. Using the very conservative method of including the quantification limit in the calculation of the mean resulted in a mean that was above NJDEP Soil Standards. Keep in mind that the mean concentration of toxaphene presented in the SEIS solely represents the mean of the quantification limits, not any actual detections. As discussed on page 4-5 of the SEIS, laboratories are able to detect and estimate the concentrations of many contaminants (including toxaphene) that are present below the quantification limits. Again, toxaphene was not detected in this way in any of the 153 sediment samples analyzed. It is highly unlikely that toxaphene is present in Reach B channel sediments. While the mean concentration of cadmium is only slightly below the NJDEP Residential Surface Soil Standard of 1.0 ppm, NJDEP personnel have indicated that they are in the process of revising this standard to 37 ppm. This is well above any cadmium level detected in channel sediments. The concentration of arsenic in one background sample collected in site 15G was 22 ppm, which slightly exceeds the NJDEP Residential Surface Soil Standard of 20 ppm. This sample was also tested using the USEPA Toxicity Characteristic Leachate Procedure (TCLP). The TCLP test indicates the concentration of various contaminants that are likely to leach from the dredged material, which could then potentially reach groundwater sources. The TCLP result for arsenic for this sediment sample was that this metal was not detected. Again, there is no reason to believe that arsenic would have any adverse effect on groundwater resources in the area as a result of using site 15G for dredged material disposal. To further assure the local community that the groundwater will not be impacted from the disposal operations at Site 15G, monitoring wells will be installed.



3. The shellfish survivability modeling was done using extreme storm events that have never occurred so that the worst possible scenario could be examined (See Section 9.3.1.1). However, when the data is interpolated to reflect "real world" storm events, no significant impacts are expected. In addition, the amount of silt material that will be placed at Kelly Island has been reduced from over 900,000 cubic yards to approximately 200,000 cubic yards mixed with 500,000 cubic yards of sand. The Kelly Island wetland restoration has also been redesigned so that this silt material will be confined behind a sand berm with a geotextile core, in an area that will only receive tidal flushing through an outlet structure. All of these actions will further minimize any impacts of silt on shellfish resources. No silt material will be placed at Egg Island Point, and the shellfish survivability model indicated no observable effect on shellfish under an extreme storm event.

4. Please refer to Response 2. Dredged material will not exceed 50 feet above existing elevations. No sludge will be disposed of at any of the areas.

5. The chart on page 3-7 is correct. Approximately 21 million cubic yards of capacity exists presently at Pedricktown Disposal areas. An additional 36.5 million cubic yards can be accommodated by subsequent dike raisings.

6. Please refer to Response 5.

7. Table 3-3 represents the amount of material disposed at each site listed, not their capacity. After disposition and management of the material, the volumes will decrease approximately 25 percent due to drying. There is adequate capacity at the disposal sites to provide for a minimum 50 years of dredging the river.

8. Benefits are based on actual operating practices of deep-draft vessels navigating the Delaware River channel.

9. The amount of material disposed of at stockpile L-5 should be 1,953,518. This accounts for the 1 million cubic yard discrepancy. This change will be made to the final SEIS.

10. The quantities are correct. Table 3-1 displays quantities for the initial dredging, while Table 3-2 displays quantities for maintenance dredging over the 50 year project life.

11. Table 3-3 will be clarified in final report to show initial disposal use.

12. Page 3-11 Have there been any studies to show that temporary habitats, such as the ones proposed, are of any value? Later in the SEIS we learn that the dredge material has few nutrients and can not support a variety of plants. We also learn that these sites are not going to be planted. Of what value is this wetland and what wildlife will it be attracting (except mosquitoes)?
13. Page 3-11 Assuming the quantities listed in table 3-1 and 3-2 and the bulked lift thickness listed here site 15G, for example, would be elevated 78 feet. Added to its current elevation of between 12-26 feet, which is due to previous dredging, at the end of the project life we will have a 100 foot high pile of sludge. I'm glad the Army Corps of Engineers has abandoned its previous goal of maximizing storage capacities. (page 3-11 also).
14. Pages 3-12 Please note that the large number of CDF's in reach B is not "especially" in New Jersey. It is only in New Jersey.
15. Pages 3-12 States that the four new CDF's provide considerable habitat value as they are.
16. Page 3-12 While the USFWS recommends the use of active management to control water levels it was deemed too expensive and therefore will not be done.
17. Page 3-15 Controlling Phragmites by grazing or mowing are not options because the capacity and height of the CDF's is of prime importance. Again, this contradicts earlier statements regarding the ACE dedication to wetlands and wildlife (page 3-11). The control of Phragmites will be extremely difficult if the projected water level of 0.5 - 3 feet is maintained. The waterfowl you are trying to attract to make these sites beneficial prefer the same conditions that Phragmites prefers. (page 3-17).
18. Page 3-16 Is it reasonable to expect the cells in the four CDF's to naturally plant themselves? Will these plants have time to grow enough for them to provide good food and cover in a three to four year period? By the time things start to grow it would be time to dump more dredge material on top.
19. Page 3-17 CDF 15G has interior drainage ditches. Plate 23 shows sluice out fall. Do either of these drain directly into the creek. There are currently ditches on that parcel that provides proper drainage of that section of the township. How will these be maintained and prevent runoff from entering directly into the creek?
20. Page 3-22 Dike construction will reduce the time a cell is left undisturbed so it could be less than three years.
21. Page 3-23 Open water disposal of dredge material at buoy 10 coincides with severely degraded benthos at that area, according to a chart in the Delaware Estuary Management Plan. Why does dumping dredged material there have such an impact on benthic communities but will not impact them in the beneficial sites?
22. Page 3-24 How did sites 15-G, 15-D, and Raccoon Island get past the cycle 3 analysis? These sites have all been recognized by the USFWS, the USEPA, or the USDOJ as nationally significant resources.
23. Page 4-18 Why would a laboratory that is testing for methylene chloride and acetone use cleaners in their lab that contain these chemicals that could potentially contaminate a sample? It not only raises questions regarding these particular tests but also indicates poor laboratory practices that could bring all results into question. Retesting should be performed for these parameters.
24. Page 4-20 States all 91 parameters tested for meet NJDEP impact to ground water soil cleanup criteria. We wonder how this statement was made, as NJDEP establishes impact to ground water soil clean up criteria for heavy metals based on site specific parameters and no site specific analysis is referenced in this report. We are particularly concerned with site 15G that has a cluster of wells that will be impacted in several years. What documentation do you have from NJDEP?
25. Page 4-20 We are not satisfied with the Toxaphene explanation. Could you explain this theory in more detail. With other chemicals we are assuming a "worst" case scenario. Why do we abandon this with toxaphene?

12. Some of the "unmanaged" active disposal areas are described in the planning aid report prepared by the U.S. Fish and Wildlife Service (FWS) which is attached to the DSEIS as Appendix B-4 (page 18). The same species and conditions are expected to occur in the new, managed disposal sites as in the shallow water areas at the National Park and Oldmans sites. To insure the success of the wetlands, an operation and maintenance manual will be developed that will provide detailed plans to establish wetland vegetation, control phragmites, and control mosquitos. See section 3.2.3.5 in the final SEIS. This plan was developed in coordination with the Corps of Engineers, Waterways Experiment Station (WES), NJDEP, FWS, and EPA. The following description of existing CDFs is taken from the FWS report:

"The Service visited the National Park, Oldmans, Pedricktown North, Pedricktown South, and Penns Grove disposal sites on April 12, 1995. The predominant cover type on all of these sites is common reed. However, water collects in low-lying portions of these sites, providing valuable habitat for a variety of wetland-associated wildlife species. A large portion of the National Park site supports shallow water interspersed with common reed and duck weed. Many species of birds were observed in this area including American coot (*Fulica americana*), scaup, bufflehead (*Bucephala albeola*), common merganser, mallard, Canada goose, great egret (*Casmerodius albus*), and red-winged blackbird.

Several species were observed on a large shallow water area on the Oldmans site including northern shoveler (*Anas clypeata*), approximately 100 scaup, ruddy duck, northern pintail, Canada goose, greater yellowlegs (*Tringa melanoleuca*), and lesser yellowlegs (*Tringa flavipes*). Additionally, the following species were observed at a shallow ponded area adjacent to the Pedricktown North site: blue-winged teal (*Anas discors*), bufflehead, mallard, scaup, black-crowned night heron (*Nycticorax nycticorax*), green heron (*Butorides striatus*), and bank swallow (*Riparia riparia*). The Pedricktown South site was predominantly common reed with some small areas of black willow. Red-winged blackbird and ring-necked pheasant (*Phasianus colchicus*) were observed at this site."

13. The bulked lift thickness does not equal the final lift thickness. After dewatering and drying the final lift thickness is approximately 40% of the bulked thickness. The final elevation of the disposal area will be about 70 feet mean low water.

14. The sentence will be changed to read "which has resulted in the current necessity for three CDF's along the Delaware River in Oldmans Township, New Jersey. Oldmans Township riverfront real estate lies entirely in Reach B.

15. It is true that these proposed disposal areas provide considerable habitat value as they are; however, these areas are needed to construct and maintain the project. By implementing the management system that will provide wetland habitat on portions of the disposal areas, by purchasing an additional 372 acres of adjacent undeveloped area that includes some high quality fresh water tidal marsh, and maintaining this area in its natural state, and by restoring 135 acres of intertidal wetlands at Egg Island Point, the overall wetland/ wildlife value in New Jersey will be improved.

16. Please refer to Response 12. Partial control of water levels will be obtained with weirs and, possibly, by diversions of water from the active side of the disposal area. An operation and maintenance manual will be developed to address detailed management of the CDFs to achieve the goal of establishing temporary wetlands on approximately half of their area. This manual will develop a planting plan which should establish wetland vegetation, a plan to control phragmites using herbicides, and a plan to control mosquitos, if necessary, using non-chemical methods. A general description of a possible management strategy has been added to the final SEIS in Section 3.2.3.5.

17. Phragmites control is difficult; however, there are a number of actions that can be taken. The substrate that will make up the wetlands in the CDFs will be dredged material from the bottom of the Delaware River and should not contain Phragmites rhizomes (roots). Phragmites will not grow from seed in standing water a few inches deep, but will can grow from runners in up to 2 feet of water (Thunhorst, 1993). Water levels will be maintained in the wetland portion of the CDF by diverting water from the active portion of the CDF where dredged material is being deposited. Therefore, the source of any invading Phragmites will be from the plants sending runners from the edges of the wetlands. Phragmites along the edge of the wetlands will be controlled by herbicides, if necessary.

18. An operation and maintenance manual will be developed to address detailed management of the CDFs to achieve the goal of establishing temporary wetlands on approximately half of their area. This manual will develop a planting plan which should establish wetland vegetation, a plan to control phragmites using herbicides, and a plan to control mosquitos, if necessary, using non-chemical methods. A general description of a possible management strategy has been added to the final SEIS in Section 3.2.3.5.

19. The sluice outfalls will drain into Oldmans Creek. Interior drainage of the area will be directed to the sluice locations. No impacts to local drainage will occur as a result of disposal operations.

20. Depending on the final O&M plan for the sites, the undisturbed time for individual cells will be approximately 3-4 years as stated, including dike raising and maintenance efforts.

21. The DSEIS in Section 9.2.3 states that there will be short term and long term impacts to benthic resources due to burial by the sand stockpiles. However, as stated in this section, no significant differences were found in benthic resources between candidate sand stockpile sites and background conditions in Delaware Bay that preclude selection as beneficial use sites. Therefore, no significant impact will occur to overall benthic resources of Delaware Bay due to the use of these sites as sand stockpiles. In addition, the sand stockpile sites are expected to be disturbed only every 5 to 10 years for beach nourishment, while the Buoy 10 site is disturbed every year by the disposal of dredged material.

22. The management and development of the new upland disposal areas which will result in portions being wetlands has been coordinated with the FWS, EPA, and NJDEP, and is generally supported by these agencies (see comments letters of these agencies to the DSEIS). The habitat that will be used for dredged material disposal has been described as "mostly poor quality wildlife habitat and that once the construction process is over habitat will be enhanced through wetlands creation in the CDFs..." (Kerlinger, 1997). The nationally significant resources are the wetland/upland complexes that surround these areas, 372 acres of which will be protected by this project.

23. The laboratories that analyzed Delaware River channel sediments used standard testing methodologies and laboratory protocols. The laboratories and procedures are approved by the U.S. Environmental Protection Agency and the New Jersey Department of Environmental Protection. Various chemicals are required to conduct these tests. Methylene chloride and acetone are commonly used in laboratory analyses. The chemical analyses tested channel sediments for a large number of chemical parameters, including methylene chloride and acetone. Sediment samples are prepared in such a way that allows testing for various groups of chemicals through one test procedure. If each individual chemical was tested separately, providing optimum test conditions for each chemical, the cost would be prohibitive. If methylene chloride or acetone were chemicals of concern, procedures would be adapted to insure that sample contamination did not occur. This was not the case for the Delaware River investigations, and is not the standard operating procedure for this type of sediment investigation.

26. **Pages 4-21 - 4-31** New Jersey DEP impact to ground water soil cleanup criteria fail to take into account contaminants that will be approximately 100 feet thick, as will be the case at these CDF's at the end of this project. Won't the thickness of the dredge material magnify the impact contaminants, particularly heavy metals, will have on ground water?
27. **Pages 4-21 - 4-34 Tables 4-9 to 4-20** Are all labeled "worst case mean". Could this be defined?
28. **Page 4-32** We are concerned with the thallium that was found in quantities above 2 ppm in thirty samples. Subsequent testing failed to reproduce these results. How are the initial high levels being explained? The bottom line is that the mean is still elevated and needs further investigation.
29. **Page 4-32** Since residential criteria were not met in all cases, have deed restriction been placed on these properties for future development? Specifically, thallium, cadmium, PAH ideno (123-cd), 2,4-dinitrotoluene, N-nitrosodi-n-propylamine, and Toxaphene do not meet residential criteria.
30. **Table 4-31** How were the "no detections" (ND) determined (for example, significant concentration of N-Nitrosodi-n-propylamine is sited at the Conrail berthing with an ND listed)?
31. **Page 4-76** Three of four samples collected at the TOSCO refinery berth had thallium level exceeding NJDEP non-residential standards. Mixing of this contaminant with other less polluted soils will still pose a health risk as the NJDEP standards for thallium are determined from practical quantification levels. The actual health based criteria is lower.
32. **Page 4-77 Table 4.31** The N-Nitrosodi-n-propylamine concentrations in sediment samples taken at the Packer Avenue and Conrail facilities exceed the non residential clean up criteria. How will this be addressed?
33. **Page 5-2** Sites work that stabilized the location of 50 ppm isochlor. Subsequent discussion is about the 250 ppm isochlor. Was the first a typo or have the standards changed?
34. **Page 5-7** states that this project assured that interested parties were given an opportunity to participate. How did you assure that the interested public was included? How were these events publicized?
35. **Page 6-1** The evaluation on these upland sites seems rather ridiculous since there is all ready a dredge thickness of approximately 12-30 feet. Much of the valuable wetlands that existed was long ago filled in. It is very easy to understand why this land is considered of low value. How additional dumping will improve these sites?
36. **Page 6-2 Table 6-1** Lists chemical sampling and testing for hazardous, toxic and chemical waste at the upland disposal sites. Please add a chart with the result from these samplings. Since these sites currently have dredge spoils to a thickness of 12-30 feet we are really testing old dredge material. Sample HTRW-13 in area 15G had arsenic levels above NJDEP criteria. Sample HTRW-7 from site 17G had lead levels above the federal regulations, and HTRW- 10 also at site 17G had levels of benzo (a) pyrene above the NJDEP standard. It is stated that there will be no remediation for these sites. We would like documentation from both the USEPA and the NJDEP that they are changing the standards for this project.
37. **Page 6-13 Table 6-3** Again demonstrates that Phragmites growth favors disturbed conditions. Phragmites is also considered of low-moderate value. How then will a sludge pile that is 100 feet high and has been regularly disturbed become moderate to high value. Won't Phragmites dominate at the end of this project, when it no longer will be controlled by flooding? Won't we end up with sites that are of less value to the wildlife?
38. **Page 6-13 Table 6-3** The table considers the inactive CDF's cells to be of equal value as a nontidal marsh or woodlands. Based on evidence from the existing sites, and the length of time it takes to develop a mature ecosystem, this area would better be

24. NJDEP does not include metals in their impact to groundwater list. The amount of fined grained material on site 15G will render the transport of heavy metals to the groundwater to a negligible level. The cluster of wells near area 15G consists of industrial supply wells for B.F. Goodrich and Monsanto Companies. A groundwater investigation and modeling study of Oldmans Disposal Area was completed by Groundwater Technologies Inc. in 1996. This included the installation of monitoring wells and testing of soil and water. The final report concluded that disposal area operations will not adversely effect the groundwater regime in this area and recommended that the area continued to be utilized as a dredge material disposal site. Oldmans Disposal area is located adjacent to area 15G and findings from the study cover the surrounding area, including area 15G. The statement on page 4-20 should have indicated that channel sediments met NJDEP Impact to Ground Water Soil Cleanup Criteria for all tested parameters that have established NJDEP criteria. This statement will be revised for the Final SEIS.

25. Refer to the response for comment number 2. The worst case analysis developed for presentation of the large volume of chemical data collected for this project is useful for putting in perspective various parameters that were found in the channel sediments such as heavy metals, PAHs and phthalates. It is difficult to have a valid concern for a parameter that was not detected once in 153 separate tests, and is not known to be a contaminant problem in the Delaware estuary. This analysis has been reviewed by a number of Federal and State agencies that are familiar with the Delaware estuary and sediment contamination issues. Not one of these agencies have raised toxaphene as a concern.

26. The fine grained silts and clays that will be placed in the dredged material disposal area will continue to build a protective barrier that restricts flow of water from the surface to groundwater sources. This barrier is already in place due to previous use of the site for dredged material disposal.

27. In many cases a chemical parameter was not detected in the sediment sample, and the laboratory reported the lowest quantifiable concentration that could be achieved with the test procedure. To include these data points in the analysis, the reported quantification limit was calculated into the mean, as if the chemical parameter had actually been present in the sediment at that concentration. This made the evaluation very conservative, because it is unlikely that the contaminant was present at that concentration. As stated in response to comment number 2, laboratories are able to detect and estimate the concentrations of many contaminants that are present below the quantification limits. As such, use of the quantification limits in calculation of the mean concentration for samples where the chemical parameter was not detected elevated the true mean concentration. This is considered a worst case analysis because we know that the true mean is elevated, and certainly can not be any higher than the reported value.

28. Thallium was not found in quantities above 2 ppm in thirty samples. During the initial sampling event in 1991, 42 sediment samples were analyzed from Reaches A and B. Thirty of these samples had laboratory quantification limits greater than 2 ppm, not actual detections. Further investigations were conducted to resolve this issue. A second round of samples were collected in 1992 and tested for thallium. Then, a third round of samples were collected in 1994 and tested for thallium. All of these additional samples had laboratory quantification limits or actual detections of thallium below 0.4 ppm, which is well below the NJDEP standard of 2 ppm. The high quantification limits, not actual detections, during the first sampling event are responsible for the elevated means presented in the SEIS.

29. Toxaphene was not detected in any of the sediment samples collected within the navigation channel or the seven port facilities. Ideno(123-cd)pyrene was not detected above the NJDEP Residential Surface Soil Standard of 0.9 ppm in any of the sediment samples collected from the navigation channel, or the samples collected from the port facilities. Five sediment samples were collected from the Conrail berthing area. Ideno(123-cd)pyrene was detected in two of these samples at concentrations of 0.10 and 0.16 ppm. The mean concentration at the Conrail facility was presented as 0.95 ppm because the quantification limit, not an actual detection, for one of the other three samples was 3.60 ppm. The highest detected concentration of ideno(123-cd)pyrene from all samples was 0.53 ppm. N-Nitrosodi-n-propylamine and 2,4-dinitrotoluene were only detected in two samples collected from the Packer Avenue Terminal. The mean concentrations presented for the Conrail facility are solely based on quantification limits, not actual detections. A total of 80 samples (35 samples from the port facilities and 45 samples from the navigation channel) were tested for these two parameters. With actual detections in only 2.5 percent of the samples (2 out of 80), there is no reason to suspect that these parameters would contaminate sediments as a result of dredged material disposal operations. The mean concentration of thallium at the Tosco facility was 2.05 ppm. This concentration is 0.05 ppm above the NJDEP standard of 2.0 ppm, a slight exceedence. As discussed in the response for comment number 28, repeated rounds of sampling in the Delaware River navigation channel suggest that thallium concentrations in the channel are below 0.4 ppm. Combining sediment dredged from the Tosco facility in a dredged material disposal area with sediment from the navigation channel would not result in sediment with a total thallium concentration of greater than two ppm. Mean cadmium concentrations do exceed the current NJDEP Residential Surface Soil Standard of 1.0 ppm at five of the seven port facilities. Mean concentrations ranged from 1.00 to 3.21 ppm. NJDEP personnel have indicated that they are in the process of revising this standard to 37 ppm, which is well above sediment concentrations. Coordination is on-going with the NJDEP. It is not anticipated that they will require deed restrictions on dredged material disposal areas to limit future development.

30. N-Nitrosodi-n-propylamine was not detected in any of the five sediment samples collected at the Conrail facility. The "ND" denotes that the listed contaminant was not detected in any of the specified number of samples taken in an area. The mean concentration of 1.19 ppm presented for N-Nitrosodi-n-propylamine for the Conrail facility is the mean of the quantification limits for the five samples. In the absence of any real data, this is all that could be presented. This value was included in Table 4-33 because the mean of the quantification limits is above the NJDEP Residential Surface Soil Standard.

31. Please refer to the response regarding thallium for comment number 29. We do not believe that thallium concentrations in sediments from the navigation channel or the port facilities will pose any health risk after placement in the dredged material disposal site. This data has been reviewed by Regions II and III of the U.S. Environmental Protection Agency and they indicated in a letter dated 17 March 1997: "....EPA continues to believe that there will be no adverse impacts associated with the disposal of sediments generated by the project". Coordination is on-going with the NJDEP.

32. As stated in the response for comment number 30, N-Nitrosodi-n-propylamine was not detected at the Conrail facility. This parameter was detected in two of the eight samples collected at the Packer Avenue facility, at concentrations of 1.4 and 1.5 ppm. These were the only two detections of this parameter out of 35 samples analyzed from the seven port facilities. In the Delaware River navigation channel, 45 sediment samples were analyzed for N-Nitrosodi-n-propylamine. The parameter was not detected in any of these samples. Out of a total of 80 samples, two samples, or 2.5 percent of the samples contained N-Nitrosodi-n-propylamine. This small number of detections is not sufficient to warrant concern that N-Nitrosodi-n-propylamine would be a contamination problem as a result of dredged material disposal operations.

33. The investigation cited on page 5-2 evaluated the location and movement of the 50 ppm isochlor. Present DRBC standards define the "salt line" as the 7-day average location of the 250 ppm isochlor. There have been and continue to be different chlorinity standards adopted to meet different purposes. These are not typographical errors.

34. During the conduct of the final design, the notification of the study initiation was made to all interested groups. In addition, newsletters were prepared and circulated. A mailing list, prepared by EPA for the Delaware Estuary Program, was supplemented and used. In addition, a series of open-invitation workshops was held during the course of the 3D salinity modeling effort to permit coordination and comments on salinity and hydrodynamic issues.

35. As described in Section 3.2.3 of the DSEIS, these sites will be subdivided so that about half of each site will be managed as a wetland for 3 to 4 years between disposal events, which will provide greater quality wildlife habitat than presently exists on these sites. This plan was coordinated with the FWS, EPA, and NJDEP.

36. The sponsor of this project is being held to all State of New Jersey standards. During the pre-construction phase (Plans and Specifications), additional testing at the proposed disposal areas will be performed in areas of concern to ensure that potentially contaminated soil is identified. Any soil found to exceed the regulatory levels will be removed prior to construction of the disposal sites. As stated in the DEIS, all debris and solid waste will also be removed from the sites. A large volume of data relating to soil testing, is available in the District Office for review.

37. All of the dredged material disposal areas will become uplands as they are filled, as described in Section 3.2.5 of the DSEIS. As stated in this section, the area will be committed to open space/environmental uses. During the project life (50 years) these areas will be managed to provide wetland/wildlife values. It is likely that some or all of these areas will be developed within the next 50 years if they are not used for this project.

38. Please refer to Responses 12 and 22.

classified with common reed. The active cells are rated equal to an agricultural or common reed environment. Given the continued dredging disturbance, these areas would more accurately be defined as ruderal.

39. Page 6-14 Table 6-3 States that wildlife movement through an active dredge site will be higher than a ruderal or agricultural site. Please explain your rationale.
40. Page 6-16 Refers to the common reed as *Phragmites communis*. The correct name, as used elsewhere in the text, is *Phragmites australis*.
41. Page 6-17 Describes ruderal areas and states they are of low value and require many years of weathering before normal succession can occur. Aren't dredge sites ruderal areas? Would these flooded "windows" provide enough time to allow growth of a variety of valuable plants?
42. Page 6-18 -6-19 The federally listed endangered peregrine falcon, the federally listed threatened bald eagle, the state listed endangered pied-billed grebe, and the state listed threatened osprey are documented as using the wetlands adjacent to the CDF's for roosting and/or foraging.
43. Page 6-19 The United States Fish and Wildlife designated the wetland complex including site 15 G a priority wetlands under the Emergency Wetlands Resource Act. These wetlands and those surrounding site 15D and Raccoon Island have numerous other Federal and state recognition including the USEPA under the Clean Water Act, the USFWS under the NAWMP, and the USFWS under the Atlantic Coast Venture. Why are these sites being allowed to be further degraded by continued dredge material if they have been identified as having national (and in the case of NAWMP, international) significance?
44. Page 6-20 States that one half of the CDF's at any given time would be left alone for 3-4 year period. Dikes repair and maintenance will shorten this interval.
45. Page 6-21 The detailed management plan should be determined by the needs of the people who are living at the end of the project. As neighbors of the CDFs we would prefer input on this project today versus leaving the problem to our children.
46. Page 6-22 States that replacement of 4 acres of non-tidal marsh will be accomplished easily on a temporary basis. What about long term?
47. Page 6-24 48 acres of moderate-high value habitat will be lost.
48. Page 6-24 States that the overall habitat value for the 1612 acres purchased for upland dredging will be of greater value during the 50 year life of the project than it is currently. It will be ruderal and covered with *Phragmites*, both of which are of low value.
49. Page 7-1 States the Potomac-Raritan-Magothy formation is the sole source aquifer for the region. According to hydrology studies that were done by Woodward-Clyde for the United States Army, the Cape May formation is also very important for the Penns Grove, New Jersey area. Penns Grove lies adjacent to the south of Oldmans Township, which includes site 15G, Oldmans 1, Pedricktown North and Pedricktown South. We feel this is a significant omission due the fact that the Cape May formation is much more shallow. Precipitation recharges the Cape May aquifer and can infiltrate to the underlying formations in areas where confining clays are absent. We are extremely concerned with ground water contamination, especially from heavy metals arsenic, cadmium and thallium.
50. Page 7-2 Again reference to NJDEP Impact to ground water soil cleanup is made. We need clarification in reference to heavy metals.
51. Page 7-3 States that the potential environmental impact is not sufficient to preclude expansion and continued use of the CDF's. What about the wells that are in close proximity to 15G.
52. Page 10-8 The bald eagle appears to be doing well in the entire Chesapeake Bay Region, which includes the Delaware Bay. However studies by Jarman et al., 1993, Steidle et al., 1991b, and Clark, 1991 cited in the Delaware Estuary Management Plan, which focused on the population solely in the Delaware Bay paints a much different

39. Active upland dredge material disposal sites are mostly covered with common reed which provides cover all year long. Ruderal areas are sparsely or unvegetated, and agricultural fields are barren during portions of the year, and therefore provide less cover for wildlife movements.

40. Correction will be made in the FSEIS.

41. As described in Section 6.3.2.5 of the DSEIS, one of the characteristics of a ruderal area is "excessively well drained". These areas will have standing water. Also please see Response 18.

42. Please refer to Section 10 of the SEIS. Biological Opinions have been received from the FWS and the NMFS which concluded that the project will not have significant adverse impacts on Federally listed species. No species protected by State law will be significantly impacted by this project.

43. Please refer to Response 22.

44. Dike repair and maintenance will occur after the 3-4 period that the CDF will be managed as a wetland.

45. Concur. Your comments on the management plan will be incorporated into the final plan.

46. Please refer to Response 37.

47. 48 acres of moderate to high value woodland habitat will be lost, but 620 acres of moderate to high value wetland habitat will be gained (see Table 6-3).

48. Please refer to Response 22.

49. The wells in the vicinity of the site are located mainly in the middle and lower PRM aquifers. The cluster of wells near area 15G consists of industrial supply wells for B.F. Goodrich and Monsanto Companies. A groundwater investigation and modeling study of Oldmans Disposal Area was completed by Groundwater Technologies Inc. in 1996. This included the installation of monitoring wells and testing of soil and water. The final report concluded that disposal area operations will not adversely effect the groundwater regime in this area and recommended that the area continued to be utilized as a dredge material disposal site. Oldmans Disposal area is located adjacent to area 15G and findings from the study cover the surrounding area, including area 15G.

50. Metals are not listed in the NJDEP groundwater cleanup standards. It is an accepted fact that metals will bind to fine grained materials. The thickness of fined grained material on site 15G will render the transport of heavy metals to the groundwater to a negligible level. The cluster of wells near area 15G consists of industrial supply wells for B.F. Goodrich and Monsanto Companies. A groundwater investigation and modeling study of Oldmans Disposal Area was completed by Groundwater Technologies Inc. in 1996. This included the installation of monitoring wells and testing of soil and water. The final report concluded that disposal area operations will not adversely effect the groundwater regime in this area and recommended that the area continued to be utilized as a dredge material disposal site. Oldmans Disposal area is located adjacent to area 15G and findings from the study cover the surrounding area, including area 15G. To further assure the local community that the groundwater will not be impacted from the disposal operations at Site 15G, monitoring wells will be installed.

51. Please refer to Response 50.

picture. They give a nest failure rate for bald eagles of 44%. They state that this is one of the highest in the country. These studies also found elevated levels of PCB's, DDT's and its metabolites, and chlordane in peregrine falcon eggs from the estuary and note that the osprey reproduction rate is almost 30% lower in the estuary than along the Atlantic coast of New Jersey.

53. Page 10-17 Although there are no known blue heron breeding sites within the dredge disposal areas, the heron rookery on Pea Patch Island is well documented and will potentially be effected by dredge activities, channel blasting and wakes from the larger ships using the deeper channel and should be addressed.
54. Page 10-17 The state endangered Northern Harrier also forages near site 15G.
55. Page 10-24 The pesticide toxaphene was omitted from the list of pesticides that were found in the sediment samples.
56. Page 10-24 States that sediments containing 10 ppm total PAH could warrant concern to our food chain. Could we have a chart added to those in section 4.0 showing mean concentrations for total PAH? We also need clarification on the "dilution theory" that will reduce the concentration of PAHs in reach B to approximately 0.2 ppm. For the statements made in this section to be accurate 1) 48 of the 49 samples would have to be at or near 0 ppm and 2) all of the 10 ppm PAH contaminated sediment from reach B would have to be mixed in the 6 CDFs versus the a single CDF as previously delineated in the SEIS.
57. Page 10-25 Again we would like documentation that the NJDEP is allowing the thallium levels to be ignored. We also want to know if they agree with the statement that there really isn't a concern until a contaminant approaches 5x the established cleanup standards?
58. Page 10-26 Will the ACE specify in the request for quote what type of equipment a contractor can use?
59. Page 10-30 How would one accomplish the task of muting construction vehicles? Is this new stealth technology?
60. Page 10-30 Has moving a nest been shown to be effective?
61. Page 10-31 What dredging would be done that is not in federal areas?
62. Page 12-2 The 1986 T/V Grand Eagle spill is not included in table 12-1.
63. Page 12-7 The Coast Guard has demonstrated its ability to deal with oil spills up to 80,000 gallons. With larger ships moving up the estuary, the likelihood of larger spills further up the river closer to critical wetland habitat is increased. The Oil Spill Contingency Plan must include both the most probable and inevitable worst case discharges. The Coast Guard states that it does not have the resources to address even 11% of a worst case discharge. It is recommended that a portion of the proposed savings be allocated to oil spill cleanup preparedness.

Thank you for assisting us to thoroughly understanding this complex document and its impact on our watershed. Please feel free to contact us if we can be assistance. The courtesy of a reply is requested.

Sincerely,

*Elaine M DuBois*  
Elaine DuBois  
Secretary-OCWA

52. The information cited about possible contaminant problems with bald eagle, peregrine falcons, and ospreys is acknowledged in the SEIS in Sections 10.1.1.1 and 10.1.1.2. PCBs, DDT and metabolites, and chlordane were not found in channel sediment samples collected from Delaware Bay. In addition to the data presented in the draft SEIS, a more recent study of PCBs has been completed by the Corps in the Delaware Bay. This study used state-of-the-art, high resolution, congener specific techniques capable of detecting PCBs in the concentration range of 1 to 10 parts per billion. This study showed that PCB concentrations in channel sediments ranged from 0 to 9.66 ppb from approximately Pea Patch Island down through Delaware Bay. These concentrations are below any level of concern. A study conducted by Arthur D. Little for the Delaware Estuary Program sampled Delaware Bay surface sediments collected in shoal habitats, and at stations that were often located in the mouths of tributaries to the Delaware River. PCB concentrations in these shoal habitats, located close to the shoreline, were much higher than concentrations found in the navigation channel. Concentrations in the vicinity of Delaware Bay averaged 76.4 ppb. It is more likely that the bald eagle, peregrine falcon and osprey are feeding on aquatic resources located close to the shoreline, as opposed to the middle of the bay, and that contaminants are derived from these shoal sources. It is also reasonable to expect sediment close to the shoreline to be more contaminated than sediment in the middle of the bay, because contaminants are normally applied or discharged in upland areas, and subsequently travel to nearby waterways.

53. A section has been added to the final SEIS to evaluate possible impacts to the heron colony at Pea Patch Island. It can be found in Section 10.4.3.6. No significant impacts are expected to occur.

54. The wetland habitat that will be created at site 15G should benefit this species.

55. The pesticide toxaphene was not detected in any of the channel sediments.

56. The "worst case" mean concentration for total PAH in Reach B sediments is 7.65 ppm. This was derived by summing the mean concentrations of all individual PAHs. This value should be considered highly inflated because PAHs were only detected in two of the 49 Reach B samples evaluated. The majority of the values used in the calculation of the individual means were sample quantification limits, not actual detections. As discussed in the response for comment number 27, each mean presented in the SEIS is elevated from the true mean because of the use of these quantification limits. Summing a number of elevated means (in this case 16) increases the conservative bias in this mean value for total PAH even more. With regard to the dilution theory, without going through the mathematics, the point we were trying to convey is that PAHs were only detected in two samples out of 49 samples. In the 47 samples where PAHs were not detected, the true concentration of total PAH is most likely close to 0. By mixing all of this material together, as occurs in a dredged material disposal site, the resulting concentration of total PAH in the mixture would be diluted to much less than 10 ppm.

57. Coordination is on-going with the NJDEP. A comment letter that addresses their concerns is anticipated at the conclusion of this coordination.

58. The contractor will be allowed to utilize heavy construction equipment as needed. No restriction will be placed on this equipment. The Corps will control the work limits and adjust these limits as required by NJDEP.

59. Reference to muting is by distance or vegetation. No modification to equipment is anticipated although the technology exists to mute the exhaust noise if it is deemed practical.

60. The present location of the peregrine falcon nest structure is being eroded away and will be destroyed if it is not moved, even if the channel deepening project is not built. The NJDEP has suggested an alternative location where the nest structure would be safe from erosion. It is likely that it will continue to be used by these birds.



61. Once the Federal channel is deepened to 45 feet, it is envisioned that the benefiting terminals will deepen their berthing areas to a depth of 45 feet.

62. U.S. Coast Guard records do not have a vessel named Grand Eagle until after 1986. A Coast Guard representative believes that a major oil spill occurred in 1985, and is likely to be the one listed a 525,000 gallon spill in Table 12-1.

63. Same-size tankers as for the 40-foot existing channel, not larger tankers, will be navigating the 45-channel. EPA in their letter 17 March 1997, concurred that the existing response network is adequate to handle spills.

February 8, 1997

Mr. Robert L. Callegari, Chief, Planning Division  
U.S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390



Dear Mr. Callegari:

I am writing to request that a public hearing be held to consider the information set forth in the Supplemental Environmental Impact Statement prepared in connection with the proposed Delaware River Main Channel Deepening Project.

I contracted Paul Kerlinger, Ph.D., a renowned environmental consultant, to review the draft. His comments are attached. While his report was generally favorable of the EIS there are numerous areas that still need to be addressed. As you requested, I am stating the reasons why a public hearing should be held. They are to discuss the following:

1. The presence of several toxic substances including cadmium, thallium, PCBs and pesticides and the possibility of ground water contamination and bioaccumulation.
2. Test wells and monitoring of the sites in the future.
3. Creating wetlands beneficial to shore bird, migrating birds, fish and wildlife.
4. Enhancement and restoration of upland habitat around the CDFs and perms by restoring vegetation native to the Delaware Valley.
5. Construction of paths and look-out points for public observation of wildlife.

I sincerely hope that we can discuss these issues and reach agreements that are beneficial to neighboring communities and residences, the river's environment and the greater Delaware Valley.

Sincerely,

Carole Brodtkin, President  
RD-1, Box 139A, Mullica Hill, NJ 08062  
(609) 478-4800, FAX (609) 478-4274

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

1. Please refer to the responses for the specific comments on sediment and groundwater contamination in the 8 February 1997 letter from Ms. Elaine DuBois, Secretary for the Oldmans Creek Watershed Association.
2. Monitoring wells will be installed prior to construction of the CDFs.
3. Section 3 of the SEIS describes portions of the project that will benefit fish and wildlife resources
4. There is no active management planned for the upland and wetland habitat that is adjacent to the CDFs and will be purchased as a result of the project. However, this area will be protected from future development.
5. The construction of public access to dredged material disposal areas would not be done because of safety concerns.

**Review of:**

**Delaware River Main Channel Deepening Project**

**(Pennsylvania, New Jersey, Delaware)**

**Draft**

**Supplemental Environmental Impact Statement**

U.S. Army Corps of Engineers, Philadelphia District

January 1997

**Prepared by:**

Paul Kerlinger, Ph.D.  
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New York, NY 10014  
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**Prepared for:**

Carole Brodtkin, President  
Oldmans Creek Watershed Association  
P.O. Box 152  
Harrisonville, NJ 08039  
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The U. S. Army Corps of Engineers is proposing to establish several new sites to dispose of dredged material from the Delaware River. Two of these sites are located near the mouth of Raccoon Creek (site 15D and Raccoon Island) and one is near the mouth of Oldmans Creek (site 15G), Gloucester County, New Jersey. This review examines the *Delaware River Main Channel Deepening Project (Pennsylvania, New Jersey, and Delaware), Draft, Supplemental Environmental Impact Statement*, U. S. Army Corps of Engineers, Philadelphia District, January 1997. This EIS will subsequently be referred to as "the EIS" or "the document." Specifically addressed were issues relating to the EIS assessment of impacts of activities at sites 15D, 15G, and Raccoon Island on wildlife at and near those sites.

1.

General Comment: I found it difficult to understand what was meant by the reference to four "new" CDF sites early on in the EIS. It was made clear later that the four "new" sites had been dredge spoil disposal sites many years earlier. Much of the agriculture that is on site 15D has been done on old dredge spoil. Thus, this site is not a newly filled site. The Oldmans Creek site was also filled historically.

2.

#### Habitat Description and Assessment of Sites

The habitat descriptions given in the documents were generally accurate. Describing the small amount of upland habitat at these sites as "moderate to higher" quality is somewhat incorrect. Many of the tree species are invasive including Pawlonia (empress or princess tree) and Ailanthus. However, the location of these sites (as stated in the document) makes them very important for wildlife. The small strip of habitat(s) that border the river at the mouth of Raccoon Creek is excellent quality and must be taken care of. A short distance inland it is degraded by berm, dredge spoil, and intensive agriculture. The strips of forest are quite good for Neotropical and other migrants as well as hawks and other birds. The entire area includes important stopover habitat for various species of birds. However, agricultural uses, which dominates sites 15D and 15G, are generally lousy for most wildlife. It is the strips of trees and shrub-scrub and wet areas that are important. The agriculture serves as a buffer, making these strips better than they would be if they were found elsewhere.

3.

#### General Description of Wildlife on the Sites

In general the wildlife descriptions are on target. However, the additional search of relevant literature would have shown that the sites are important stopover sites for several types of birds. Kerlinger and Palumbo (1991), Kane et al. (1993), and Boyle (1986) are important citations that were not included (see below for complete citations). These involved intensive studies and casual observations (by some of the state's experts) of the areas including more complete lists of birds (breeding, wintering, migrating) than were included in the references cited. However, they specifically stated that the old dredge sites were not great for wildlife. They did find some grassland species (Bobolinks, Savannah Sparrows, and Northern Harriers) in the agricultural fields during autumn migration.

4.

1. Comment noted. No response necessary.

2. As described in Section 6.2.1.2 of the SEIS, all of the areas that are proposed for the upland confinement of dredged material were all used for this purpose in the past.

3. As shown in Table 6-3, the woodlands that exist in the upland sites as primarily rated as moderate to high because they serve as wildlife movement corridors and not the species of trees present.

4. The description of the existing habitat at the CDFs was based on an environmental assessment prepared by Dames and Moore, Incorporated, an environmental consulting firm that was retained by the Corps of Engineers, as well as a planning aid report prepared by the FWS which is attached as Appendix B-4. The New Jersey Department of Environmental Protection (NJDEP), Division of Fish, Game, and Wildlife, and Natural Heritage Program; the U.S. Department of Agriculture, Natural Resources Conservation Service were contacted in the preparation of this document. In the preparation of the SEIS, the habitat was described, and species that would characterize the area are listed. The list is not meant to be exhaustive. Species that are protected by Federal and state law are described in Section 10.

## EIS Coverage of Significant/Critical Adjacent Wildlife Habitat

Although the areas proposed for the actual CDFs are not prime wildlife habitat, the sites are adjacent to some very high quality habitats. At Raccoon Island, a swamp forest that is a short distance upstream from the proposed CDF is relatively intact and supports breeding and (especially) migrating songbirds. Many of the latter are Neotropical species that are now the focus of attention by state and federal agencies because many are experiencing population declines.

5.

Raccoon Creek upstream from the stream mouth and Route 130 is a world class migratory stopover and late winter staging site for waterfowl, especially Black Ducks and Northern Pintails. These birds also use the lower portion of Raccoon Creek, between the dredge spoil sites, but not as much as farther upstream (all the way to the NJ Turnpike). These populations exceed 50,000 to 60,000 Black Ducks and Pintails in aggregate in February and March. The marshes upstream from (and to a lesser extent downstream) from Route 130 contain some of the best quality and largest expanses of wild rice marshes in New Jersey. These wetlands are delicate and are responsible for the waterfowl aggregations. In addition, many other species use the wetlands upstream of Route 130 including egrets and herons (virtually year round). The egrets travel from the Pea Patch Island colony downstream and are present all along the creek. Many raptors can be found in this area (mostly in autumn through spring) including many Red-tailed Hawks and a few Bald Eagles, Cooper's Hawks (state endangered species), and Great Horned Owls. These species primarily use the fields and wetlands upstream from Route 130, although they also wander downstream to the Delaware River. (See Kerlinger and Palumbo 1991 and Kane et al. 1993 for more details regarding wildlife that use Raccoon Creek.)

6.

The area designated as site 15G along the Oldman's Creek is also adjacent to very high quality habitat. To the east of this site (just past the railroad tracks and Pedricktown Road) is the Pedricktown Marsh, which is one of the finest birding sites in southern New Jersey. The reason for its being great birding is the habitat. The marsh has long been known to attract large numbers of migrating shorebirds, including several rare species (Boyle 1986). Kane et al. (1993) have detailed what is present on this marsh and surrounding habitats, referring to the habitat as "one of the very best examples of tidal marsh habitat." The marsh is also frequented by many other species of birds during both breeding and migration seasons. For these reason it should remain intact and undisturbed.

7.

Although no construction or CDFs are planned for the prime habitats on Raccoon Creek and Pedricktown Marsh (Oldmans Creek), there is a potential for disturbance because these sites are directly adjacent. If done correctly the actual construction process and resulting CDFs should have little impact on these critical habitats. There must be some assurance that disturbance will be minimal.

8.

5. The value of the wetland complexes that are adjacent to the proposed CDFs is described in Section 6.3.3 of the SEIS. The nationally significant resources are the wetland/upland complexes that surround these areas, 372 acres of which will be protected by this project.

6. Please refer to Response 5 above.

7. Please refer to Response 5 above.

8. Methods to minimize impact to nesting and migratory species are described in Section 6.6.2.1 of the SEIS. Construction of the CDFs will be avoided between April 1 and July 15, as recommended by the FWS, as much as is practicable.

## Endangered Species

For the most part, endangered and threatened species (state and federal) will be unaffected by the construction and operation of CDFs at the proposed sites. Few individuals of endangered species use the sites, according to the EIS. This has also been found by independent observers who have studied the Raccoon Creek and Oldmans Creek systems. Most usage by endangered and threatened species has been upstream from the proposed CDFs. It is likely that an occasional individual of an endangered or threatened species will wander into the areas, but not often.

The proposal to subdivide the CDFs and turn them into wetlands for waterfowl and shorebirds, as well as proposals to enhance habitat around the CDFs would likely be beneficial to endangered and threatened species in several ways. By creating habitat that attracts shorebirds, waterfowl, and songbirds, several species of hawks, including listed species like Bald Eagles, Peregrine Falcons, Cooper's Hawks, and Osprey will also be attracted. Furthermore, species like the NJ endangered Pied-billed Grebe will nest on dredge spoil ponds. There are several records of its nesting on dredge spoil sites downstream from sites 15D, 15G, and Raccoon Island. Also, Short-eared Owls (another NJ endangered species) nests in such situations. Thus, the proposed habitat enhancements may provide better habitat for endangered and threatened wildlife than the existing habitats. Again, this will depend on how well the plans are designed, executed, and eventually how the CDFs are managed.

## Toxic Substances in Dredged Material and Wildlife

The presence of several toxic substances (organic and inorganic) including cadmium, thallium, PCBs and pesticides in Reach A and B is troublesome. Although they are reported to be present at levels below or barely exceeding state and federal regulations, the possibility of bioaccumulation is still present. This may be a problem because raptors in the area, such as Peregrine Falcons and, possibly Bald Eagles, may be attracted to waterfowl and shorebirds that are in turn attracted to the CDFs (and subdivided wetlands that will be created). However, this may not be dangerous because most of the birds will be there for only a short period of time (during migration) during which bioaccumulation is not significant. The presence of these toxins is problematic, although according to the Corps report, the levels are very low and the chance for human or wildlife to experience negative impacts is not present. These statements should be weighed cautiously.

## Design and Placement of Berms

By adjusting berms to avoid high quality wetlands and some upland forest or shrub-scrub, the engineers seem to be leaving some of the best habitat intact. These include the wetland areas at the mouth of Raccoon Creek, which is very fine habitat. Basically, the berms at the Raccoon Island site are proposed for most of the same places where they were placed years ago. At sites 15G and 15D, they ring the agricultural fields and some other areas that are rather poor habitat. There seems to be little problem with the location of these berms. A suggestion regarding these

9. Comment noted. No response necessary.

10. An operation and maintenance manual will be developed to address detailed management of the CDFs to achieve the goal of establishing temporary wetlands on approximately half of their area. This manual will develop a planting plan which should establish wetland vegetation, a plan to control phragmites using herbicides, and a plan to control mosquitos, if necessary, using non-chemical methods. A general description of a possible management strategy has been added to the final SEIS in Section 3.2.3.5..

11. The bioaccumulation of toxic substances in dredged material is not expected to be a problem. See Sections 4.4.2 and 10.4.1.3 of the SEIS.

12. In general the new berms will be placed inside the old berms. In many areas the old berms have tree cover on them which will be preserved. The berms will be sprayed with a herbicide, if necessary, to minimize the risk of phragmites invasion. It would not be practicable to plant trees on the new berms since they will be raised periodically throughout the life of the project. In addition, the presence of trees on the berms will render them more permeable and make it more difficult to hold water in the wetland.

berms is that something be done to insure that they are not invaded by Phragmites. Such an invasion would reduce the potential for making the sites attractive to wildlife. If plantings of native trees is possible on the berms, it would greatly enhance the sites for wildlife, especially migrating songbirds and hawks. It would also make the areas friendlier to resting herons and egrets, as well as Ospreys and Bald Eagles that nest in the area. Arcane regulations in some areas restrict tree placement on dams and detention/retention basins, which may make this proposal impossible.

#### **Disturbance of Wildlife During Construction and After Construction**

Once the CDFs are constructed, disturbance to endangered and threatened species, as well as other wildlife should be minimal. Very little in the way of human activity occurs at dredge spoil containment areas after they are constructed. Thus, wildlife will be disturbed only rarely.

During construction there is more potential for disturbance. However, Peregrine Falcons that nest on the Commodore Barry Bridge should not be negatively impacted. These birds are adaptable to activities below them. This is the case in the Arthur Kill and other portions of the Lower New York Harbor. Boats that stop or work under these bridges rarely disturb the birds enough to make them take flight.

The few other individuals (Bald Eagles, Ospreys, etc.) that use the area occasionally may be disturbed slightly. Disturbance will occur along the river bank where these species like to perch to hunt and rest. Because there is ample habitat upstream and downstream for these individuals, minor disturbance is acceptable. Midstream dredging and boat activity will not have major negative impacts. Once the construction and dredging is completed, these species will undoubtedly use the riverside adjacent to the new CDFs - if perch trees are not disturbed.

#### **Prospects for Habitat Enhancement and Wetlands Creation**

The EIS outlines two avenues for habitat enhancement that would be beneficial to wildlife. The subdivision of the CDFs and creation of wetlands within them could provide significant habitat for waterfowl and shorebirds that migrate through the area. Frequently CDFs become a sea of Phragmites that is useless to most wildlife. By designing the new wetlands so that the water levels can be adjusted to avoid Phragmites invasion and provide a combination of open water and exposed mudflats, the sites will prove to be exceptionally good for these birds and other wildlife.

The enhancements of uplands adjacent to the CDFs to create forests and shrub-scrub habitats has much promise. As with the CDFs, Phragmites can invade these areas as well, rendering them of little importance to wildlife. If these areas become forests and shrub-scrub habitats with a minimum of Phragmites, they will become important migratory stopovers for songbirds and hawks. In addition, the edges, where exposed perches will become available, will provide primary hunting areas for various species of songbirds and hawks.

13. The Corps of Engineer will coordinate with the FWS and NJDEP prior to construction to make sure that Federal and state listed species will not be impacted, as described in Section 10.5 of the SEIS.

14. Please refer to Response 13, above.

15. Please refer to Response 13, above. Trees on and outside the old berms will be preserved.

16. Phragmites control is described in Section 3.2.3.5 of the SEIS.

17. No active management is planned for the upland areas that will be purchased adjacent to the CDFs; however, as described in Section 6.6.2.2, these areas are expected to improve in habitat value during the project life as woodlands mature and Phragmites and ruderal areas succeed into more valuable habitats such as woodlands. Herbicide will be used on Phragmites areas is necessary to protect the CDFs from invasion.

18.

With both wetlands and upland enhancement proposals, care must be taken to insure that they are done correctly and to avoid invasion by Phragmites.

#### Literature Search and Review of Experts/Consultants in Area

The literature cited in the document was superficial. Several omissions were evident. Oldmans and Raccoon Creek have been studied extensively by nonprofit environmental organizations during the past decade, including the creek mouths and areas proposed for "new" CDF. That these reports were not cited shows a lack of thoroughness by consulting biologists and or agency staff whose work was cited.

19.

The following reports detail the wildlife that use areas designated in the document as 15D, 15G, and Raccoon Island. The studies on which these reports are based were conducted by the New Jersey Audubon Society, Cape May Bird Observatory, and New Jersey Conservation Foundation using some of the leading naturalists in New Jersey. The principal investigators of the first two reports have intimate knowledge of both Oldmans and Raccoon Creeks.

Kane, R., P. Kerlinger, and K. Anderson. 1993. Delaware River and Bay Tributaries Greenway Project. Prepared by New Jersey Audubon Society for the New Jersey Conservation Foundation. Franklin Lakes, NJ.

Kerlinger, P. and J. Palumbo. 1991. A preliminary bird inventory of Raccoon Creek, Gloucester County. Records of New Jersey Birds.

Also see: Boyle, W. J., Jr. 1986. A guide to bird finding in New Jersey. Rutgers University Press. New Brunswick, NJ. - A review of Pedricktown Marsh (Oldmans Creek) shows that this creek has a long and exceptional history of wildlife observation. See remarks on Pedricktown Marsh above.

#### Overall Assessment of Project Impacts

20.

The construction (reconstruction) of CDFs at sites 15D, 15G, and Raccoon Island as stipulated in the US Army Corps of Engineers January 1997 EIS is not judged to entail major environmental degradation that will impact upon endangered, threatened, or more common wildlife. This judgement is made recognizing that the existing habitat where the CDFs will be constructed is now mostly poor quality wildlife habitat and that once the construction process is over habitat will be enhanced through wetlands creation in the CDFs and through uplands habitat restoration adjacent to the CDFs. If these habitat enhancements are successful and if care is taken to avoid wildlife disturbance during the construction process, the CDFs will provide significantly better habitat than exists now at these sites. Furthermore, care must be taken to avoid disturbing the very high quality habitat sites adjacent to these three proposed CDFs.

18. Please refer to Response 16.

19. Please refer to Response 4.

20. Construction of the CDFs will occur by utilizing material from within the disposal area to raise the existing dikes. The alignment of the new berm will be interior of the existing berm. It is unlikely that areas outside the CDF will be impacted by dike raising activities. Access roads will follow existing roads to further minimize impacts.



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## **PROFESSIONAL EXPERIENCE**

### **Environmental Consultant, Author, and Speaker**

1994-

- \*Provide expert testimony, field expertise, and research design to industry and conservation organizations
- \*Provide innovative solutions to difficult environmental problems
- \*Natural history and conservation writing
- \*Provide informative, technical, and entertaining programs to a variety of audiences

### **Director of Research - New Jersey Audubon Society**

1987-1994

- \*Developed first comprehensive conservation/ecology research program for NJ Audubon
- \*Initiated and directed first statewide Breeding Bird Atlas for New Jersey
- \*Directed 1,000% growth in research funding
- \*Provided Expert testimony for NJ Attorney General's Office and US Justice Department in wetlands and endangered species cases
- \*Served as liaison to corporate and government agencies involving regional conservation issues and projects
- \*Designed and implemented ground breaking ecotourism research network across the US and Latin America

### **Director of NJ Audubon's Cape May Bird Observatory**

1987-1994

- \*Facilitated 400% growth of annual budget and 250+% growth in membership and 1,500% growth in retail sales
- \*Renovated and expanded physical facility (300% increase in size)
- \*Supervised staff and volunteers (tripled)
- \*Developed college-level internship program involving students in hands-on experience in research and conservation
- \*Secured funds to establish first Observatory Endowments
- \*Originated and Chaired campaign for new Center for Research and Education on Delaware Bayshore (purchased property for new visitor center)
- \*Served as media spokesperson (newspapers, magazines, radio, and television)

## **PROFESSIONAL EXPERIENCE**

Assistant Professor - University of Southern Mississippi Taught Introductory Biology, Biostatistics, and conducted first North American studies of Stopover Ecology of Neotropical migrants	1985-1986
Postdoctoral Fellow - University of Calgary Conducted ground breaking research on bird migration and ecology	1983-1985
Assistant Professor - Clemson University, South Carolina Field tested first Avian Migration Mobile Research Laboratory for Electric Power Research Institute (EPRI)	1982-1983

## **EDUCATION**

State University of New York at Albany	Ph.D., Biology	1982
	M.S., Biology	1981
State College of New York at Oneonta	B.A., Biology	1976

**PROFESSIONAL AND POPULAR PUBLICATIONS:** Outstanding publication record in scientific and popular literature - 50+ papers (published in 4 countries), 3 books, 40+ popular articles, 100s of technical reports). List and samples available upon request.

## **BOOKS PUBLISHED:**

Kerlinger, P. 1989. *Flight Strategies of Migrating Hawks*. Chicago University Press, Chicago, IL. pp. 374. (a technical volume, reviewed in dozens of journals and magazines including *Science*)

Kerlinger, P. 1995. *How Birds Migrate*. Stackpole Press, Harrisburg, PA. pp. 250. (an informative and popular volume)

Kerlinger, P. 1997. *The Hawk Migration Handbook*. in preparation (a substantive volume for the lay reader).

**REFERENCES:** A list of references from industry, academia, and, or the nonprofit conservation sector (including agencies) are available upon request.

Delaware Mobile Surfishermen, Inc.  
Kenneth Dodd, President  
700 E. Laurel Street  
Georgetown, De 19947  
March 16, 1997

Mr. John Brady  
Planning Division  
US Army Corps of Engineers  
100 Penn Square East  
Philadelphia, Pa 19107-3390

Re: Delaware River Main Channel Deepening Project Draft  
Published January 1997 (Sand Stockpiling at Slaughter Beach  
and Broadkill Beach Delaware)

Dear Mr. Brady:

Thank you for the opportunity to present some comments relative to the project stated above.

The document is in itself a sizeable and impressive assimilation of a wealth of information. You are to be commended for the organization and detailed statements regarding the many and complex studies made and referred to throughout.

Although there are many areas deserving of comment, we will limit our concern to the sand stockpiling planned for Slaughter Beach and Broadkill Beach. These particular locations are of primary concern to commercial and recreational fishermen as well as supportive related businesses of the Lower Delaware Bay. We are aware that attention to any segment of the Delaware River will impact many other, if not all, segments of the Delaware River and Bay Areas.

The proposal states that 4.7 million cubic yards of dredged material will be dumped 1/3 to 1/2 miles off of Broadkill Beach and Slaughter Beach and that this stockpiling will reduce the MLW -8' to a MLW of -3', smothering all beneath community (aquatic life) in approximately 750 acres. There is no mention of the "coral Beds" at these beaches. The sabellaria vulgaris (a lowly worm type) continuously build and rebuild these so called "coral beds" and have probably been doing this for centuries. This form of marine life will be threatened and possibly be smothered from sand either dumped directly on the beds or from drifting from sand stockpiles. These "coral beds" serve as a primary spawning, nursery, and feeding area for both fin fish and shell fish populations. It is difficult to rationalize that these particular high quality primary fishing and crabbing locations for commercial and recreational fisherman will be threatened and possibly be eliminated.

We agree with the U.S. Fish and Wildlife Service, Region 5, "Study of Beneficial use of Dredged Material", a letter included in ACE's proposal, which states that "the use of sand stockpiles for the disposal of dredged material cannot be considered "beneficial" in

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

terms of its effects on fish and wildlife." They (U.S.F.W.S.) further conclude that "the proposed disposal of dredged material in sand stockpiles would adversely affect fish and wildlife resources and that the use of sand stockpiles should be minimized or eliminated".

We the DMS, suggest that any "beneficial" use will not compensate for the detrimental effect of stockpiling and therefore strongly recommend that sand stockpiling be eliminated.

We further respectfully request that a public hearing be held related to this project and that this special hearing be held at the Biden Environmental Education Center located in the Delaware State Park At Cape Henlopen.

Thank you for your attention to this matter.

Sincerely,



Kenneth Dodd, President DMS

cc: Rep. George Carey  
Robert Martin

As part of the Channel Deepening Project, the Corps of Engineers proposes to place approximately 1.9 million cubic yards of clean sand approximately 0.33 miles offshore of Broadkill Beach (Site LC-5), and approximately 2.8 million cubic yards approximately 0.5 miles offshore of Slaughter Beach (Site MS-19). The purpose of these sand stockpiles is to provide a source of clean sand for future beach nourishment. The sites were chosen by examining their biological characteristics, as well as economic and engineering constraints. Each of these sites were sampled twice, in different years, to characterize their benthic communities. Although impacts will occur to the local populations of benthic resources, as described in Section 8.3 of the SEIS, no significant differences were found between any candidate site and background conditions in Delaware Bay that would preclude its selection as a beneficial use site. Therefore, no significant impact will occur to either the diversity or overall populations of benthic resources in Delaware Bay due the use of any of the candidate sites as either wetland restorations or sand stockpiles.

The sand builder worms Sabellaria vulgaris, often referred to as "coral", are relatives of the bloodworms often used for bait; they are not reef-forming corals. Reef-forming corals all live in warm shallow tropical marine environments. Sabellaria are members of the Class Polychaeta in the animal Phylum Annelida, while reef corals are members of the different Phylum, Cnidaria.

The star coral, Astrangia danae occurs in Delaware Bay, and is found from Cape Cod to Florida. It is our only shallow water, northern coral and is found on pilings rocks, and shells. It is subtidal occurring from shallow depths to 36 meters. Limited tolerance for brackish water and turbidity, plus lack of suitable attachments inshore, may account for its scarcity along most of the coast. The star coral occurs in colonies that consist of low cuplike corallites, 5 - 6 mm in diameter, united by a thin crust, or sometimes forming low branching groups several inches in across (Gosner, K. 1978. A Field Guide to the Atlantic Seashore, Houghton Mifflin Co.). No star coral was found at either Site MS-19 or LC-5.

Sabellaria are found from Cape Cod to Georgia, and are easily mistaken for corals. They live in tubes constructed out of sand grains; these tubes often occur together in large enough numbers to form reefs. Sabellaria also have a crown of threadlike structures which protrude from the open end of the tube similar in appearance to the tentacles of reef corals (Burton, W. 1997. Versar, Inc. Personal Communication). They grow to a length of one to two inches, usually on hard substratum. They occur from lower intertidal to subtidal at shallow depths, including estuaries in salinities above 15 ppt (Gosner, 1978). They form productive aquatic habitats which provide food for fish, which are attracted to the Sabellaria colonies (Tinsman, J. 1997. DNREC. Personal Communication).

Effects on Sabellaria populations by the proposed sand stockpiling of dredged material, will likely be very localized. Sabellaria are common in many areas of the east coast of the United States and produce large numbers of planktonic larvae which will soon recolonize any affected areas with suitable habitat.

It is also unlikely that any significant populations of Sabellaria occur within the MS-19 sand stockpile area. Of the 80 locations sampled, Sabellaria was collected at one site at rather low concentrations. In addition, the substrates encountered at MS-19 were sands rather than the hard substrates necessary for Sabellaria to establish themselves. The populations in Delaware Bay are probably located in shallower water containing rocks, boulders, or stones in the substrate. It is more likely that the sand worms would occur on site LC-5, which has more silt and clay content in its substrate. However, none were found during benthic sampling.

Even though few (Site MS-19) or no (Site LC-5) Sabellaria were found at the sand stockpile sites, they may still occur in these locations, since their distribution is "patchy". Local fisherpersons report that sand worms occur either in or near the sand stockpile areas. The Corps of Engineers shares the concerns of the fishing public that no adverse impacts occur to important aquatic resources and will investigate this question in the next study phase, Plans and Specifications.



February 8, 1997

Robert L. Callegari  
ATTN: Environmental Resources Branch  
U.S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Mr. Callegari,

The Delaware Riverkeeper Network is concerned about the lack of a public hearing and the short time period given for commenting on the Delaware River Main Channel Deepening Project supplemental EIS. Forty-five days is not enough time to allow the public to review, digest and prepare useful comments on this very dense, technical and complicated 1 1/2 inch thick document. The given time period is barely enough time for government personnel who are paid for such efforts. Our nation's environmental laws were written to protect the environment and the public. Public participation requirements are essential for achieving this goal. Providing a time frame which is inadequate for allowing the public to consider and comment on the proposal at hand, here the SEIS, is essentially the same as denying the opportunity altogether. This fact is reinforced by the Delaware Estuary Program's CCMP (Action W7, page 139) wherein it states that one measure of success of dredging in the Delaware River is to have "an informed public on the continued maintenance and proposed dredging process in the Estuary." The Delaware Riverkeeper Network believes it is imperative that the comment period be extended and a public briefing and hearing be held on the SEIS. The public must have a true opportunity to participate in this public process.

At this time, Riverkeeper would also like to submit some preliminary comments on the SEIS.

1. Private docks and berths along the Delaware are a potential haven for toxics. Once the main channel of the Delaware River is dredged, channels to the private docks and berths will necessarily have to be dredged to accommodate the larger ships. Such action is an unavoidable consequence of the main channel deepening. Therefore the associated environmental impacts must also be studied, considered and reviewed. Without this review, the EIS and SEIS cannot be said to have fully considered all associated environmental impacts and consequences of the project.

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

1. Sediment cores were collected from the seven industrial facilities and port terminals that would benefit from the main channel deepening project. These cores were subjected to bulk sediment analyses to quantify chemical contaminant concentrations in berthing area sediments. A total of 35 sediments samples were analyzed. The results of this investigation are presented in Section 4.5 of the SEIS. Berthing area sediments were similar to navigation channel sediments with respect to contaminant levels. Overall, test results suggest that sediments within port facility berthing areas are sufficiently clean to conclude that dredging and upland dredged material disposal operations would not result in any significant environmental impacts.

2. The basic premise that the dredge is necessary to ensure that the Delaware River ports stay competitive with other ports on the east coast has not been adequately analyzed or supported. It seems to be a generally accepted premise, but one that is not documented. For example, what about the fact that other nearby rivers have 50 foot channels – if competitiveness is the rationale, how can we remain competitive with a 45 foot channel when other nearby ports are already at 50?
3. Riverkeeper continues to be concerned about potential impacts to oyster beds – particularly the acknowledged possibility of impacts resulting from sand stockpiling and restoration work conducted on and around Kelly Island and Egg Island Point. While the SEIS acknowledges the possibility of long-term, adverse impacts there is not a concrete plan in place for preventing these impacts, only a promise of future monitoring and some unspecified contingency plan. Riverkeeper feels the Corps response to these potential impacts is unacceptable.
4. The Corps proposes to stockpile sand off shore for later reuse in beach renourishment projects. The SEIS does not adequately justify the need for stockpiling and later reuse, double-handling, which will result in repeated disturbance of local benthic communities and fisheries.
5. Riverkeeper is particularly concerned about proposed beneficial use site MS-19B to be used for sand stockpiling. The SEIS describes site MS-19B as having "one of the highest quality benthic community among the 12 potential beneficial use sites and would be expected to sustain greater impacts due to the lower recovery potential of its benthic [ ] community." The SEIS then states that in spite of this site's "species richness," and high "abundance of equilibrium species ... indicative of a stable, diverse, mature community," because the background conditions of the site are not significantly different from the rest of the Bay it may still be used for sand stockpiling. Clearly this site is different from the rest of the Bay, that is why its benthic community thrives. The Corps' justification for using this site is not supportable by the evidence provided nor does it make any sense. The site is home to a healthy benthic community with a high frequency of equilibrium species. The site's benthic community would suffer long-term, perhaps irreparable, impacts if the site is disturbed for the proposed use. The site should therefore be removed from the list of beneficial use sites.
6. A significant number of agencies, individuals and organizations raised concerns during the FEIS comment period regarding the potential for alteration of the River's salt line and intrusion into upriver drinking water supplies. Through modeling the Corps has determined that there will not be any impacts to drinking water aquifers from the movement of the salt line. According to experts, the SEIS fails to provide the data which would allow others to verify the Corps' findings and conclusions. As a result, the public is unable to properly comment on this finding. Additionally, what if the Corps is wrong? The SEIS fails to provide a plan for dealing with this very real possibility.
7. Dredging the shipping channel another five feet is going to impact the circulation patterns and salinity line of the River. The SEIS indicates that these alterations will not be significant enough to impact benthic invertebrates and fish. While other agencies, that lack the expertise to make such analyses, are willing to defer to the Corps on this point with the stipulation that the Corps monitor the actual impacts in the future, Riverkeeper does not agree that we should be taking such a risk.

2. As for all Corps of Engineers projects, the 45-foot channel deepening has been subject to a very rigorous technical, economic, and environmental review. The Corps' cost-benefit analysis in the feasibility report was reviewed and approved by the Secretary of the Army and the Office of Management and Budget prior to authorization by Congress. This procedure reflects the longstanding detailed approach which characterizes Corps' studies and the standard independent review process. The benefit-cost ratio for the project is 1.4 to 1, with benefits estimated to exceed costs on an average annual basis of \$11.4 million per year over the 50-year project life.

Each foot of additional depth adds to the competitiveness of the Delaware River ports. The Corps applied a stringent optimization approach to determine that net benefits are maximized at the 45 foot depth. Incremental benefits would continue to accrue at depths beyond 45 feet but at a lower magnitude than incremental costs.

3. Please refer to USDOJ Response 5. Since the distribution of the draft SEIS, the Kelly Island wetland restoration site has been re-designed (See Response 3, above, and Section 3.3.3.2 of this SEIS), which greatly reduces the possibility of silt escaping and reaching the oyster bed areas. The amount of silt being placed in Kelly Island has been reduced from over 900,000 cubic yards to under 200,000 cubic yards. The silt will be enclosed in a containment area by a sand berm with a geotextile tube core for extra protection. The berm will not be overtopped except by the most severe storms that are only expected to occur once in 100 years. The previous design would have allowed tidal inundation with every tide. The revised design will allow tidal inundation, but only by controlled outlet structures. The entire Kelly Island structure will be monitored, repaired and maintained, as necessary. The silt within the containment structure will be mixed with and covered by an additional 500,000 cubic yards of sand which will become vegetated and will provide an extra measure of protection. Because of all of the measures that are mentioned above, it is extremely unlikely that nearby oyster beds and lease areas in Delaware would be adversely impacted by silt escaping from the Kelly Island wetland restoration; and even more unlikely that the oyster areas in New Jersey, which are more than 4 miles away. This discussion has been added to Section 9.3 of the this SEIS. Section 9 of the SEIS documents the analyses performed to address impacts associated with proposed beneficial use sites. Specifically with regard to oyster resources, our analyses indicate that the predominant direction of sediment transport (essentially 100% sand) from the wetland protection and sand stockpile sites will be landward and alongshore, away from the nearest oyster habitats. Further, concerns regarding potential release of silt from Kelly Island have been addressed through a significant reduction in the quantity of silt being placed there, as well as by the increased size of the protective sand dike protecting Kelly Island.

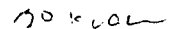
4. Please refer to EPA Response 3 and NOAA Response 2. Although impacts will occur to the local populations of benthic resources as described in Section 8.3, no significant differences were found between any candidate site and background conditions in Delaware Bay that would preclude its selection of as a beneficial use site. Therefore, no significant impact will occur to either the diversity or overall populations of benthic resources in Delaware Bay due the use of any of these sites as either wetland restorations or sand stockpiles. The ecological impacts of sand stockpiling mainly occur when the sand is placed on the beaches. The sand stockpile sites needed to be located within a close proximity to the beaches so that beneficial use (i.e., access to sand material for future placement on the beach could be achieved by State of Delaware) of the dredged material could be realized. Once on the beach, the sand will provide habitat for horseshoe crabs and shorebirds.

We need to ensure that the data is correct before we act. Once the patterns have changed and the benthic and fish populations have reacted, fulfilling agency requests that maintenance dredging be halted and the channel be allowed to return to 40 feet will not be so easy, and it will necessarily result in another habitat alteration that will once again impact our benthic and fish populations.

8. Residents along the River are already subject to massive dredge spoil piles which have become home to large phragmites populations. Pedrickstown is a prime example – dredge spoils piled up 50 feet from previous dredging efforts block the town's historic view of the River. The SEIS discusses spoil piles 100 feet high. A better plan has to be laid for the dredge spoils before this project goes forward.
9. Site 15G has been designated as priority wetlands pursuant to the Emergency Wetlands Resource Act, and sites 15G, 15D and Raccoon Island have received wetlands recognition under other laws including the Clean Water Act and the NAWMP. It is wholly inappropriate, and in contradiction with our nation's environmental protection laws, to allow these sites to be used as disposal sites for dredge spoils. How can the Corps justify such action?
10. There is a contradiction between the SEIS conclusion regarding the health of bald eagle populations in the estuary as compared to the Delaware Estuary CCMP. The SEIS says the populations are doing well, while the CCMP indicates they are still being impacted by toxics, along with other important bird populations including osprey and peregrine falcons.
11. What will the impacts of the project be on Pea Patch Island and its heronry? The SEIS does not appear to address this question except indirectly by stating that no breeding areas are located in the project.

The Delaware Riverkeeper Network, an affiliate of the American Littoral Society a not-for-profit organization, has been working since 1988 to protect and restore the Delaware River, its tributaries and habitats. We request that the Army Corps of Engineers extend the comment period on the SEIS and hold a public hearing to allow all the residents of the watershed the time and attention needed to thoroughly review and understand the proposed project, its impacts and the SEIS.

Yours sincerely,



Maya K. van Rossum  
Executive Director



Fred Stine  
Project Coordinator

cc: Jennifer Lukens, Delaware Coastal Management Program  
Sarah Cooksey, Delaware Coastal Management Program  
Joe Paccoli, New Jersey Department of Environmental Protection  
James Walsh, Pennsylvania Dept of Environmental Protection

5. Please refer to USDOJ Response 12.

6. Please refer to USDOJ Response 14. It is the view of the District that the hydrodynamic/salinity modeling performed to date demonstrates that the predicted salinity impacts of the deepened channel are small enough to be considered negligible with respect to water quality and living resources. The SEIS, Section 5, presents a summary of the most significant findings of the hydrodynamic/salinity modeling. The modeling was performed over a period of about two years during which periodic open-invitation workshops held in order to guide the focus of the modeling and to present results of work in progress.

There is evidence from recent investigations by USGS that the present DRBC chlorinity standards for RM 98 are overly conservative with respect to possible impacts on PRM water quality in the Camden County area recharged by Delaware River water. Further, there are many possible alternate drought management strategies which could be implemented to conserve basin storage for optimal repulsion of salinity/chlorinity in the vicinity of RM98 during drought conditions.

7. Please refer to USDOJ Response 14 and NJDEP Responses 36, 37, and 38. The knowledgeable scientific community recognizes that the existing circulation and salinity regimes of the Delaware Estuary are highly dynamic, with large changes in flow velocity, flow direction, and salinity occurring naturally in response to variations in fresh water inflow distribution, both in time and space, wind, tides, and adjacent ocean boundary salinity. These changes occur over periods as short as several hours, such as during storm events, over periods of 12.4 hours, the duration of the average tidal cycle, and over periods of seasons and years. The modeling has demonstrated over a wide range of hydrological conditions that the changes induced by channel deepening are a small fraction of the natural dynamic variability in flow and salinity for the estuary, and that no detectable adverse impacts will be associated with the proposed deepening.

8. The Philadelphia District is using dredged material for beneficial uses where ever possible. Consideration of beneficial uses has been investigated by the Corps. Beneficial uses of dredged material has been recommended in the Delaware bay where most of the dredged material is sand. In the Philadelphia area of the Delaware River, the dredged material contains a higher proportion of fine grained material and must be confined to prevent water quality degradation. The District is exploring alternatives to the CDFs, and in some cases has been successful. For example, dredged material is being used to build a new runway at the Philadelphia International Airport. However, not all dredged material is suitable for construction because of differing physical properties.

9. Please refer to Response 22 for Ms Elaine Dubois, Oldman's Watershed Association.

10. The draft SEIS acknowledges that there are still contaminant problems with bald eagles and peregrine falcons in Sections 10.1.1.1 and 10.1.1.2, respectively. The USFWS has stated in their Biological Opinion that this project is not likely to adversely effect federally listed species under their jurisdiction.

11. The proposed project is not expected to cause additional adverse impacts to the heronry at Pea Patch Island. A discussion has been added to the final SEIS in Section 10.4.3.6.



**DELAWARE AUDUBON SOCIETY**

Chapter of National Audubon  
Box 1713, Wilmington, Delaware 19899  
302-428-3959

February 11, 1997

Mr. Robert L. Callegari  
Attn: Environmental Resources Branch  
U.S. Army Corp of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390

RE: STATEMENT OF THE DELAWARE AUDUBON SOCIETY PERTAINING TO  
THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT ON  
THE DELAWARE RIVER MAIN CHANNEL DEEPENING PROJECT  
(PENNSYLVANIA, NEW JERSEY, AND DELAWARE)

Dear Mr. Callegari:

The Delaware Audubon Society is a statewide citizen organization committed to the conservation and protection of our natural world. We submit herewith, our concerns, comments and questions on the Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project (Pennsylvania, New Jersey, and Delaware).

Our study of the Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project has revealed several areas where we believe the Corp has not provided sufficient evidence to demonstrate their claims of no detrimental impact.

P. 1-4. Groundwater, section 1.1.1.3. This section discusses the evaluation of potential contaminant travel times from the proposed project disposal sites to nearby drinking water by

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.



I. the United States Geological Survey. Their report determined the mean travel times for groundwater from the new proposed disposal areas to reach any potential water supply well is in excess of 50 years, except for a cluster of wells near area 15G where the report states that "travel time to these wells could be relatively short, perhaps on the order of several years". The Corp's conclusion to this reported concern states, "the new dredged sediments from the 45 foot project contain no harmful levels of contamination; so in the event that the water were to reach the well from the disposal area, it would have no impact on water quality."

Dredged materials from Reach B will be deposited at site 15G as well as several other sites.

P. 4-21 - 4-31, Bulk Sediment Analyses, section 4.1. The following is a list of all

contaminates found in bulk sediment samples within Reach B: Antimony, Arsenic, Barium,

2. Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc, Aldrin, Dieldrin, Chlordane, Toxaphene, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, Endosulfan, DDT, DDD, DDE, Mirex, Methoxychlor, Parathion, Malathion, Hexachlorocyclohexane (Alpha, Beta, Delta, Gamma (Lindane)), Guthion, Demeton, PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, PCB-1016, Acenaphthene, Naphthalene, Acenaphthylene, Anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Phenanthrene, Fluorene, Fluoranthene, Benzo(a)anthracene, Benzo(ghi)perylene, Dibenz(a,h)anthracene, Ideno(123-cd)pyrene, Pyrene, Bis(2-ethylhexyl) phthalate, Butyl benzyl phthalate, Di-n-butyl phthalate, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Volatile Halogenated Alkanes, Volatile Halogenated Alkenes, Volatile Aromatic Hydrocarbons, Volatile Chlorinated Aromatic Hydrocarbons, Volatile Unsaturated Carbonyl Compounds, Volatile Ethers, Phenols, Substituted Phenols, Organonitrogen Compounds, Chlorinated Aromatic

1. The cluster of wells near area 15G consists of industrial supply wells for B.F. Goodrich and Monsanto Companies. A groundwater investigation and modeling study of Oldmans Disposal Area was completed by Groundwater Technologies Inc. in 1996. This included the installation of monitoring wells and testing of soil and water. The study concluded that disposal area operations will not adversely effect the groundwater regime in this area and recommended that the area continued to be utilized as a dredge material disposal site. Oldmans Disposal area is located adjacent to proposed area 15G and findings from the study cover the surrounding area, including area 15G. To further assure the local community that the groundwater will not be impacted from the disposal operations at Site 15G, monitoring wells will be installed.

2. Sediments from Reach B were analyzed for all of the contaminants provided in this list, but the majority of these contaminants were either not found or found in only one or two of the samples. Heavy metals were frequently detected in Reach B sediments. Except for thallium, all of the metals were below NJDEP Residential Surface Soil Standards. This means that the material is suitable for use as "clean fill" for residential development, with regard to thallium, as discussed in the SEIS the mean concentration is elevated because of the high detection levels achieved in the first round of sampling. In two subsequent rounds of sampling, 40 additional sediment samples show that the actual concentration of thallium in channel sediments is less than 0.4 ppm, which is well below the NJDEP Residential Standard of 2.0 ppm. The only pesticide detected in Reach B sediments was endosulfan. This contaminant was only detected in one of 49 samples. Likewise, PCB-1254 and PCB-1248 were the only PCB's detected. These were again in only detected in one of the 49 samples. Several PAH's were detected in Reach B, but in only two of the 49 samples. There were similar results for phthalates, except for di-n-butyl phthalate, which was detected in 20 of 28 samples. The highest concentration of di-n-butyl phthalate detected in Reach B sediments was 1.51 ppm, which is well below the NJDEP Residential surface Soil Standards of 5,700 ppm. The remaining groups of volatile and semi-volatile organic contaminants were primarily undetected in the entire river. This information is presented in Section 4.0 of the SEIS. Based on the data it is concluded that Reach B sediments are clean, and would not have an adverse impact on water quality in the area. This conclusion is supported by the U.S. Environmental Protection Agency. With regard to the cluster of wells near site 15G., please refer to the response of comment 1.

Hydrocarbons, Chlorinated Aliphatic Hydrocarbons, Halogenated Ethers, and Miscellaneous Oxygenated Compounds. While all the average channel sediment concentrations were below the NJDEP standards, except for the heavy metal thallium and the pesticide toxaphene, the sum total of contaminants found in the sediment material to be dredged would most certainly have a adverse impact on the quality of water found in the cluster of wells subjected to leaching of water from dredged sediments. Have the private owners of these wells been personally advised of the contamination to their drinking water the dredged material poses?

P. 4-19. Each of these contaminants carries with it an additional lifetime cancer risk of either 1 of 1,000,000 or 1 of 100,000, depending on the contaminate. What is the cumulative additional lifetime cancer risk associated with ingestion of above group of contaminants in total? In light of irreparable damage to nearby drinking water supplies, we submit that the new proposed site 15G is unsuitable for disposal of dredged material and an alternate site should be sought.

P. 9-2 - 9.4, Kelly Island, section 9.1.5.1 and Southeast Egg Island Point, section 9.1.5.2.

Historically, at both of these islands, horseshoe crabs have come ashore on the sandy beaches to spawn. After the dredging in Reach E, the Corp plans to store dredged material at both islands for later beneficial uses. Due to the CDF dike, used to prevent erosion of dredged material, the sandy beaches necessary for spawning of the horseshoe crab may quickly vegetate with marsh grass, making them no longer attractive to horseshoe crabs. The horseshoe crab population has been declining steadily for a number of years. It is of utmost importance that we do not do anything that will further stress the reproduction of this unique species. The Delaware shore areas are the only areas in the world where horseshoe crabs spawn. Any activity by man, which interferes with the horseshoe crab's natural breeding cycle,


3. Both the Kelly Island Site and Egg Island Point Site are wetland restorations; material will remain at these sites and not be removed for other uses. The Kelly Island site has been redesigned to provide much more spawning habitat for horseshoe crabs than presently exists at this site (Please refer to Section 3.3.3. The designs for both Egg Island Point and Kelly Island were coordinated with the FWS, EPA and the respective state resource agencies.

puts it at a greater risk. Not only are horseshoe crabs an important part of the migratory bird lifecycle, they are also proving invaluable in medical uses for mankind. Medical research is currently being conducted to uncover the full benefit the horseshoe crab offers man in his fight against disease. The Corps' plans for storage of dredged material at these islands have a direct negative effect on the ability of the horseshoe crab to continue its life cycle.

P. 1-20 - 1-21, Relationship to Environmental Statutes, section 1.2. Finally, the Delaware Audubon Society would like to understand the reasons why the Corp was granted an exemption under Section 404(r) when Congress authorized the project in October 1992. The Corp reports that all tests and findings represent negligible impact, if any, to the environment. Therefore, why would an exemption from any section of the Clean Water Act be necessary and permitted?

In conclusion, the Delaware Audubon Society feels that upon review of the Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project (Pennsylvania, New Jersey, and Delaware) there are sufficient reasons to warrant a public hearing. The possible contamination of drinking water supplies and the resulting increased health risk posed to humans represents an issue the Corp must address before any further development of this project can proceed. Therefore, we are requesting a public hearing to address more fully our environmental concerns.

Sincerely,

  
Leslie G. Savage  
Board of Directors

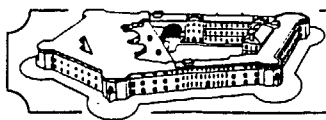
4. Section 404(r) is a portion of the Clean Water Act, 33 USC 466 et seq. It exempts Federal projects from obtaining a water quality certification if the project has been authorized by Congress, and an environmental impact statement, that includes an evaluation of the Section 404(b)(1) guidelines, has been submitted to Congress before the actual discharge of dredged or fill material in connection with the construction of the project and prior to either authorization or appropriation of funds for the project. These conditions were met with the submission of the final EIS in February, 1992 and subsequent authorization in October, 1992 as part of the Water Resources Development Act of 1992. This was concurred in by EPA; see there comment letter dated March 17, 1997.

DELAWARE AUDUBON SOCIETY

-5-

2/13/97

Cc: Senator Joseph Biden  
Representative Michael Castle  
Christophe Tulou  
Sarah W. Cooksey



## FORT DELAWARE SOCIETY

Founded 1950

P.O. Box 553 • Delaware City, DE 19706 • (302) 834-1630

February 13, 1997

Mr. Robert L. Callegari  
United States Army Corps of Engineers  
Philadelphia District  
100 Penn Square East  
Philadelphia, PA 19107-3390

Ref: Supplemental EIS For The Delaware River Main Channel  
Deepening Project, January, 1997.

Dear Mr. Callegari,

The Fort Delaware Society is an all volunteer, not for profit, organization that is dedicated to the preservation of Fort Delaware as a historic site.

Fort Delaware is on the National Register of Historic Places. It sits on Pea Patch Island in the Delaware River opposite Delaware City, Delaware. Fort Delaware is the focal point of Fort Delaware State Park. The fort and island are open to the public from the last weekend in April to the last weekend in September. Fort Delaware is a regional tourist attraction which saw approximately 25,000 visitors last season.

In 1947, when Pea Patch Island was returned to the State of Delaware by the Federal Government, the Corps of Engineers retained title to approximately 19 acres on the eastern edge of the island.

In the late 1960's, the riprap sea wall on Corps property near the southeast corner of Pea Patch Island was breached in a storm and never repaired. Numerous requests for action by the U.S. Army Corps of Engineers have resulted in inspections, but no resolution. Likewise, attempts to have ownership of the parcel transferred to the State of Delaware, or for a long term lease arrangement to be established have been rejected because of the impracticality of certifying the parcel to be ordnance-free. The State of Delaware has indicated willingness to take the land without such certification, since it had not been obtained for the rest of the island.

Meanwhile, since the sea wall was breached, the island has been eroding. Erosion is now caused by each storm and by the wake of each passing ship in the main ship channel. The channel is very close to the underwater banks of Pea Patch Island.

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

Please refer to response to the Delaware Parks and Recreation Council.

In 1990, the accelerating erosion began to uncover several cannon carriages that pre-date the Civil War and are believed to be the only known originals in existence. The Corps of Engineers, mindful of Federal Law concerning the preservation of historic artifacts, provided funding for the rescue and preservation of the gun carriages.

At the same time, the Corps determined that the most cost-effective way to protect the island from further erosion, and thus protect other artifacts in the erosion area, was to replace the riprap sea wall in its original location.

To date, the riprap sea wall has not been replaced or repaired. The total loss of artifacts known to be in the eroded area is unknown. We do know that a searchlight base has been destroyed, and a building site, believed to be a blacksmith shop, has also been destroyed.

The erosion is continuing and accelerating. If not arrested, it will eventually threaten Fort Delaware itself.

We believe that deepening the main ship channel will further undermine Pea Patch Island. Also, since larger ships will be able to navigate upriver, we believe the larger wakes will be harmful to Pea Patch Island.

We are disappointed to hear that the affects on Pea Patch Island of the channel deepening project are not addressed in the January, 1997, EIS.

We recommend that the Environmental Impact Statement be expanded to cover the impact on all of Pea Patch Island, including the historic areas and the heronry on the north end of the island.

Unless ships are required to reduce speed when passing Pea Patch Island, we recommend that the riprap sea wall on the property still owned by the Corps of Engineers be restored in its original location as soon as possible and prior to any channel deepening. This action is necessary to prevent further destruction of historic artifacts buried on Pea Patch Island.

We urge you to do whatever you can to expedite corrective action regarding the Pea Patch Island sea wall.

The Fort Delaware Society did not receive a copy of the January, 1997, EIS. We learned of its existence indirectly through others. We became aware of the February 17th deadline for comments on January 29th, but we did not obtain your comment address until February 12th. These comments have been hurriedly assembled. With more time, we could be more specific.

We would like to be kept informed of any future reports that the Corps may issue relative to this project. Also, we would like to be informed of any hearings or public meetings that may take place with respect to the proposed Delaware River Main Channel Deepening Project.

Very truly yours,

For the Officers and Directors of the Fort Delaware Society

*William E. Craven*

William E. Craven  
Chairman of the Board  
Fort Delaware Society

cc: Christophe A. G. Tulou, Secretary,  
Department of Natural Resources and Environmental Control  
State of Delaware



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March 11, 1997

Mr. John Brady  
Planning Division  
U.S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Mr. Brady:

I wish to express my thanks for the rapid forwarding of the Draft Delaware River Main Channel Deepening Project SEIS of January, 1997 and for granting us an extension on the comment period.

The publication is impressive in both size and content and it is obvious that many individuals extended much concentrated effort to produce the document. It is also obvious that the large scope of this project requires an extraordinary attention to detail in all aspects of planning and implementation.

Due to the size and complexity of the document as well as time constraints we have restricted our comments to areas of our immediate concern as a non-profit land conservancy dedicated to the preservation of Delaware's prime coastal wetlands.

#### Pea Patch Island

At the present time, this Island is subject to severe erosion along the shoreline adjacent to the main channel. The project construction and associated increase in adjacent vessel activity is likely to accelerate erosion. The Island is important as a historical site -- Fort Delaware, and as the site of one of the largest Heron nesting areas on the East Coast.

- The Pea Patch shoreline must be stabilized prior to commencement of the project.
- Construction and dredging activities must not take place during bird migration or nesting periods (March through August).

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

1. The erosion problem on the shoreline of Pea Patch Island is being addressed by the Corps of Engineers and State of Delaware. The problem will be resolved prior to the construction of the proposed deepening of the Delaware River Main channel to 45 feet.
2. Please refer to Section 10.4.3.6 which has been added to the final SEIS and discusses potential impacts to Pea Patch Island. In addition, please refer to USDOI Response 2.



Mr. John Brady  
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### Kelly Island

It is our understanding that the Kelly Island plan as outlined in the SEIS has been modified. Our comments are therefore general in nature and perhaps are being addressed in the new plan.

3. • The site should be modeled to show shoreline changes through time if no project is undertaken. The stated erosion rate of 15' to 30' per year will not be sustained.

4. • Prior to final project approval, the Geotextile tubes must be thoroughly tested in all Delaware Bay environmental conditions including thick sheet ice being driven by northeast winds. Potential for failure is great and repair potential is limited.

5. • It has been our experience that disturbed sites and wetland restoration sites adjacent to the Delaware Bay grow the best phragmites mono-culture in spite of our best efforts and intentions. The last thing Delaware needs is another 90 acres added to our phragmites spray program. Chemicals used to control phragmites will also kill Spartina alterniflora.

6. • The creation of 900' of sand beach for horseshoe crab utilization is not significant enough to justify this project.

7. • Sudden and catastrophic failure of the structure in severe northeast driven storm conditions would cause significant damage to adjacent benthic communities including the oyster beds.

8. • We request a cost benefit analysis of this project even if changed from the description in the SEIS.

3. Historical surveys over more than 100 years, and more recently, aerial photography, indicate that there has been persistent erosion at rates between 15 and 30 feet per year along Kelly Island. There has been no significant, recent diminution in this rate of erosion. There is no "marsh shoreline erosion model" presently available that can predict future shoreline behavior more accurately than an extrapolation from over 100 years of data. The important point is that valuable wetland resources at Kelly Island will continue to be lost, perhaps at an accelerated rate under some projections of accelerated sea level rise, if no action is taken to protect these areas. If no action is taken, the finite wetland resources of the State of Delaware will continue to be diminished.

4. The tubes will be buried in the sand under normal circumstances and are intended to act as a redundant barrier in case of accelerated erosion. The exposed groins and peninsula protection may be partially exposed. The high strength material that will be utilized has been exposed to ice conditions similar to the Delaware Bay and has performed well. In the case of a failure in an individual tube, the redundancy of the design and maintenance commitment of the Corps to this site will ensure that it will not greatly effect the integrity of the site. A field test is not practicle for this work.

5. Please refer to the redesign of Kelly Island in Section 3.3.3.2 in the final SEIS. Phragmites will be controlled within the wetland restoration by water level manipulations and spraying of herbicides if needed. The salinity levels of the water in the site should help limit the establishment of Phragmites. This site will be managed by the DNREC.

6. Please refer to the redesign of Kelly Island in Section 3.3.3.2 in the final SEIS. Approximately 5,000 linear feet of horseshoe crab spawning beach will now be provided.

7. The redesign of Kelly Island will greatly reduce the risk of catastrophic failure as described in Section 3.3.3.2 of the final SEIS. In addition, please refer to USDOJ Response 5.

8. The benefit-cost analysis for the project was conducted. The benefit cost ratio is 1.4 to 1, with benefits estimated to exceed costs on an average annual basis of \$11.4 million per year over the 50-year project life.

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At the present state of analysis and plan development as presented in the SEIS, the Kelly Island project is unacceptable as a beneficial site.

#### Sand Stockpiles

There exists a plethora of contradictory comments and information regarding sand stockpiles through the SEIS text and in the correspondence appendix.

9. • MS-19 supported the highest quality benthic community of all potential stockpile sites. At this site 500 acres would be put under 5' of sand -- about 2,858,300 cubic yards. This in itself is a significant adverse impact.
10. • L5 is identified as having a lesser quality benthic community than MS-19; 230 acres of benthic community buried under 5' of sand -- 953,518 cubic yards also represents a significant adverse impact.
11. • Predicted single event sediment drift of 40,000 cubic yards of sand are predicted in a 2 - 5 year storm. This represents a significant adverse impact on adjacent benthic communities.
12. • Both areas are sites of high quality sportfishing activity.
13. • Sand stockpiles would be an impediment to shoreward horseshoe crab migration.
14. • The amount of sand stockpiled appear to be excessive when compared to Broadkill and Slaughter Beach replenishment requirements.
15. • If there is a beach replenishment plan (or utilization of these sand stockpiles), it must be incorporated into the SEIS and be subject to evaluation as part of the entire project.

9. Please refer to USDOJ Response 12.

10. Please refer to USDOJ Response 12.

11. Please refer to USDOJ Response 12, NOAA Response 2, and EPA Response 3. The referenced quantities represent an estimate of storm-related sand transport from the stockpiles principally in the onshore and alongshore directions. Under existing conditions (in the absence of the stockpiles), this storm transport undoubtedly still occurs, although possibly at a lower rate. Storms acting on sandy (or muddy) bottom areas of Delaware Bay are a recurrent natural phenomenon, and the benthic communities which inhabit these areas have adapted to the dynamic nature of this habitat.

12. The impacts of the sand stockpiles on finfish are described in Section 9.2.4 of the SEIS. The impacts are expected to be temporary and localized.

13. According to Dr. Robert Loveland, Department of Biological Sciences at Rutgers University, an expert on horseshoe crabs, the sand stockpiles should have no impact on the horseshoe crabs' ability to reach spawning beaches (Personal Communication, 22 April, 1997). The proposed sand stockpiles will not pose an impediment to horseshoe crab migration. The sediment to be placed at these sites consists of medium- to fine-grained sand which will be shaped by waves and currents into a form which will resemble a natural sand shoal, of which there are many examples in Delaware Bay. The crest elevation of the stockpiles will be three feet below the plane of mean low water, and thus will always be submerged. Further, wave and current action will flatten the side slopes of the original deposits such that no barrier to crab movements will exist.

14. The sand stockpiles are large compared to the short-term beachfill needs of Broadkill and Slaughter Beaches because the channel dredging, which is the source of the sediment, will be accomplished more-or-less continuously over a period of approximately one year. The sand will be available thereafter for long term (i.e., 50 year) periodic beach nourishment of these two beaches.

15. The least costly option is to place the dredged material into the two sand stockpile sites. This option has been incorporated into the overall economic evaluation of the project. The State of Delaware will pump the sand from the sand stockpile sites to the beach. The cost to pump the material from these stock pile sites will be incurred by the State.

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16.

- We request a cost benefit analysis of sand stockpiles at these sites.

17.

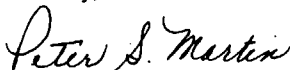
Due to the overall lack of justification for sand stockpiles in general and in specific for these sites and considering the adverse effects of the stockpiles, they are unacceptable as beneficial use sites.

The high ecological value of the Delaware River and Bay Estuary System has been well established on the local, regional and international level. The estuary is one of few U. S. areas designated as a RAMSAR site and also has the unique distinction of being a site in the Western Hemisphere Shorebird Reserve Network. We must make extraordinary efforts to insure that we do not damage this highly significant area.

Although there is much information and data included in the SEIS, there exist many contradictions and questions that must be addressed before project approval and initiation. We request a public hearing to expand the project comment forum.

Once again, thank you for the opportunity to comment.

Sincerely,



Peter S. Martin  
Field Ecologist

PSM/ssc

cc: Mr. Holger H. Harvey

16. Please refer to Response 8.

17. Please refer to NOAA Response 2.



February 13, 1997

Robert Callegari  
Environmental Resources Branch  
US Army Corps of Engineers  
Wanamaker Building, 100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Mr. Callegari,

New Jersey Conservation Foundation supports the Federation of Gloucester County Watershed Associations' request for a public hearing on the draft supplemental EIS for the Delaware River Channel Deepening Project.

First, while four new dredge spoil sites are proposed to be situated in or on the border of Gloucester County only one copy of the document was made available in a Gloucester County library and none were made available in Salem County facilities. This made it difficult for citizens of the region to read and comment on the entire document. (FYI, there is a fairly new Gloucester County library in Mullica Hill.)

Second, we are worried about the placement of proposed site 15G on the marshes of the Pedricktown Complex, one of the premier waterfowl habitats in the state as well as an important migratory shorebird and raptor location. The New Jersey Audubon Society rated the Pedricktown Complex as one of the most critical habitats in the entire Delaware Bay watershed in their *Delaware Bay and River Tributaries Habitat and Wildlife Inventory*. An excerpt from this study is attached.

Third, it is very difficult to predict the effect of channel deepening on the Delaware River's salinity and circulation. Computer models are only as accurate as the data entered into their equations, and they rely very heavily on human assumptions and hypotheses. There is little precedent for a channel deepening project of this scope and we are concerned about potential unforeseen and deleterious effects on the Delaware Estuary and the Delaware Bay Watershed.

Finally, while the supplemental EIS addresses many of the questions raised by the Delaware Estuary Program's Science and Technology Advisory Committee in 1992, the economic necessity of the channel deepening project still has not been proven to our satisfaction. What justifies such a huge expenditure of taxpayer dollars? Will the benefits really outweigh the costs?

Sincerely,

*Harriet Honigfeld*  
Harriet Honigfeld  
Project Coordinator

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

1. Additional copies of the draft SEIS were sent to three Gloucester County libraries and three Salem County libraries on February 12, 1997. Please see response to comment from Ms. Elaine Dubois, Oldman's Creek Watershed Association.

2. A report by Dr. Kerlinger, one of the authors of the report that you have attached, reviewing the draft SEIS is attached to a comment letter from Ms. Carole Brodtkin and is included in the "Comment and Response" section of the SEIS. Dr. Kerlinger's report is generally supportive of the proposed management of portions of the new CDFs, including site 15G, as wetlands/wildlife habitat.

3. Although the Corps of Engineers would agree that it is "difficult" to accurately model the hydrodynamics and salinity regime of the Delaware Estuary, it is generally accepted by the scientific and engineering communities that appropriate numerical modeling is the only valid method to assess the impacts of channel deepening on flows and salt distribution in the estuary. In this regard, the Corps of Engineers has spent over a decade in the continuous review and improvement of the CH3D (Curvilinear Hydrodynamics in 3 Dimensions) numerical model. This model incorporates the effects of tides, wind, fresh water inflows, estuary geometry and bathymetry, and salinity at the ocean boundaries in order to compute water levels, flow velocities in three dimensions, and salt distribution. CH3D is not the only model in existence which could be used to evaluate the impacts associated with channel deepening. However, it was judged to be the most appropriate model for this project.

After the model was developed, it was subjected to a series of verification runs in order to assess how well the model was able to reproduce flows and salt distribution as measured over several hydrologically different periods. Sections 5.9.1 through 5.9.3 of the SEIS document the verification process, and demonstrate the ability of the model to reasonably reproduce flows and salt distribution under a range of conditions ranging from extreme drought to typical spring high-flow periods. Following the discussion of model verification, the SEIS presents results of various model runs comparing existing and deepened channels. It is the position of the Corps of Engineers that CH3D represents the best analytical tool available with which to determine salinity and hydrodynamic impacts associated with the proposed channel deepening. In addition, please see USDOJ Response 14.

4. As for all Corps of Engineers projects, the 45-foot channel deepening has been subject to a very rigorous technical, economic, and environmental review. The Corps' cost-benefit analysis in the feasibility report was reviewed and approved by the Secretary of the Army and the Office of Management and Budget prior to authorization by Congress. This procedure reflects the longstanding detailed approach which characterizes Corps' studies and the standard independent review process. The benefit-cost ratio for the project is 1.4 to 1, with benefits estimated to exceed costs on an average annual basis of \$11.4 million per year over the 50-year project life.

except from: R. Kane, R. Hartinger, & K. Anderson  
Delaware Bay & River Tributaries Habitat  
and Wildlife Inventory. Prepared for  
New Jersey Conservation Foundation.  
Oldmans Creek

38. **Pedricktown Complex:** The Pedricktown Complex is a site extending from the Delaware River east to Route 295 along the lower reaches of Oldmans Creek. The area consists of spoil banks at the river, arum, cattail and *Phragmites* marshes along Oldmans Creek. This site is well known and well reported as an endangered bird species site, one of the premier waterfowl sites in the state, an important migratory shorebird site, and important raptor site. It is also one of the very best examples of tidal marsh habitat in the entire study area. Site visits were made July 12, September 6, October 3, October 31, November 8, and December 6, 1991, and January 10, February 6, February 13, February 29, March 5, April 4, April 8, May 8, May 27, and June 10, 1992.

The site is well known to the team and amply documented in *Records of New Jersey Birds* as an important bird site. It is the home for an incredible population of muskrats. Resident birds include or have included in the past Pied-billed Grebe (E), Com. Moorhen, Ruddy Duck, Great Horned Owl, Red-winged Blackbird, and Red-tailed Hawk. Possible breeding species include Bald Eagle (E), on forested portions of the site, and N. Harrier (T) and Short-eared Owl (E) on the spoil banks near the river. Short-eared Owls (E) were present well into spring on the spoil banks (Ward Dasey, 1990 pers. comm.). An impoundment on the spoil banks was a breeding site for Pied-billed Grebe (E) and Ruddy Duck in the early stages of its formation. The impoundment on the spoil banks is used by migratory waterfowl and also by shorebirds, and the spoil banks generally are an important wintering ground for raptors, including the above mentioned species. The spoil banks are succeeding to *Phragmites*, smartweeds, cherry and other small trees, mugwort and other disturbed area plants. Indigo Buntings and Red-winged Blackbirds nest in the vegetation.

In the marshy portions east of Route 130, with their abundant food and extensive tidal flats, there is very heavy use by migratory waterfowl and shorebirds. The largest concentrations of Northern Pintails in the state occur here in February, with counts of these early migrants totaling 5 figures (Ward Dasey, Region 4 Editor, *Records of New Jersey Birds*, Summer 1991; Sheryl Forte, pers. comm.). Black Ducks occur in winter in the same numbers as well. Clearly, this is an important Atlantic flyway site. Lesser numbers of Mallard, Am. Widgeon, and Green-winged and Blue-winged teal also occur. Often the flocks of Green-winged Teal are very large. Shorebirds by the thousands use the site as a stopover site for feeding and loafing during spring migration. Greater and Lesser Yellowlegs, and Pectoral Sandpipers (100's to 1,000's of the three species) and smaller numbers of Least Sandpipers, Dunlin, dowitchers, and species rare in spring such as Lesser Golden-plover and Ruff, are all well documented from the site. The Pedricktown causeway is the scene of 100's of birders annually in April, because it is the Ruff capitol of the East Coast. The Ruff is an Eurasian species that recently colonized Alaska and possibly other locations in North America. To see one of these rare birds in North America is a treat. At Pedricktown, up to 8 have been seen during a single high tide (on one day) in April. Herons also use the site heavily for feeding and roosting during post-breeding dispersal. Such sites are becoming a precious commodity.

As a Bald Eagle (E) recovery site, the area has good potential. Eagles have been wintering there and remaining into spring in the late 1980's and early 1990's and nesting is a good possibility. The habitat and recreational values of the place are so great that it ranks very high for acquisition and conservation measures; acquisition possibly of both buffer and wetland, and conservation measures at the spoil banks. Spoil banks can, with management be converted to waterfowl and shorebird habitats. Coordination between federal and state agencies is required to do this.

**Botanical Description:** The lower portion of the Pedricktown Complex (north of Route 130, to the river) is a reed-overgrown spoilbank. The middle portion (Pedricktown marsh proper) is a wild rice/spatterdock dominated marsh, with some arrow arum, pickerelweed, rice cutgrass, blue flag, water hemp, cattail, *Phragmites*, nodding tickseed sunflower, and *Polygonum* spp., including arrow-leaved and halberd-leaved tearthumbs, and swamp rose mallow. Dikes and edges have buttonbush, indigo bush, and willows.

Twelve Great Egret were present on the site on September 6, along with scores of Bobolink in the wild rice. On September 8, Stilt, Western and Baird's sandpipers were recorded on the Pedricktown spoilbanks by Ward Dasey.

On the October 31, 1991 visit, high water from the hurricane was over the road. On the marsh were Great Blue Heron (T), 200 Green-winged Teal, 125 Black Duck, 30 Mallard, 30 Pintail, 7 Greater Yellowlegs, 42 Pectoral Sandpiper, 9 Dunlin, 10 Ring-billed Gull, 10 Forster's Tern, and Herring Gull. Overhead raptors included 10 Turkey Vulture and single Cooper's Hawk (E), Sharp-shinned Hawk, Peregrine Falcon (E), and Red-tailed Hawk. One N. Flicker, 2 Carolina Wren, 2 Am. Robin, and White-throated Sparrow were in the wood fringe and 500 Red-winged Blackbird were on the marsh.

Photographs were taken of this site on November 8, 1991. Two hundred-fifty Black Duck were on the marsh at high tide with small numbers of other waterfowl.

At low tide on December 6, 1991, the birds present were: 2 Snow Geese, 50 Ring-billed Gull, 4 Black Duck, and 2 Mallard.

On January 10, 1992, one hundred and fifty Tundra Swan, 500 Canada Geese, 100+ Black Duck, Sharp-shinned and Cooper's (E) hawk, 6 Red-tailed Hawk, Northern Harrier (E), and 2 Am. Kestrel were found on site along with 335 Red-winged Blackbird. A large sign on Route 130 indicated 354 acres (some fill) were for sale, fronting on Route 130 (east side). Land is zoned AR, railway available (1-800-777-6444, ext 3051 - contact Ed Bailey).

On February 6, 1992, additional photographs of this site were taken. Present were 140 Tundra Swan, 1,200 Canada Geese, 150 Mallard, 50 Black Duck, 12 Green-winged Teal, 20 Canvasback, Red-tailed Hawk, N. Flicker, and Hairy Woodpecker. These species were noted casually during picture-taking; the entire site was not covered that day.

On February 13, 1992, with snow and ice, there were 40 Black Duck, 6 Com. Merganser, 1 Red-tailed Hawk, 1 Herring Gull, 2 N. Flicker, 1 Carolina Wren, 10+ White-throated Sparrow, and a few (4) Am. Crow, as well as 2 Golden-crowned Kinglet.

On February 29, 1992, there were 300 Green-winged Teal in an impoundment on the spoil banks. This pool has potential as a water-bird breeding site.

On March 5, 1992, 140 Tundra Swans were on the marsh, along with 100 Green-winged Teal (on the spoil pool), 125 Am. Black Duck, 20 Mallard, 2,000 N. Pintail, and 2 Red-tailed Hawk. Four Killdeer were also on the marsh. Am. Woodcock tracks were found on the spoil bank where Ward Dasey reported several on February 29, 1992 (pers. comm.), probably breeding birds. Thirty Ring-billed Gull were also on the marsh. Also seen were 15 Mourning Dove, 2 Belted Kingfisher (spoil pool), Downy Woodpecker, N. Flicker, 2 Blue Jay, 2 Tufted Titmouse, 6 Carolina Wren, 3 Am. Robin, 2 N. Cardinal, Am. Tree Sparrow, 75 Song Sparrow, 5 Swamp Sparrow, 25 White-throated Sparrow, Dark-eyed Junco, 675 Red-winged Blackbird, 350 Com. Grackle, and 6 House Finch. A farm on the north side of Harrisonville Road is for sale.

At low tide on April 4, 1992, a Golden Plover, several Greater Yellowlegs, and a Killdeer were on the flats. (Ward Dasey reports that twice weekly counts in January and February of the visible portions of Oldmans Creek and Raccoon Creek [including the Pedricktown Complex] indicated a total population for the 2 creeks of 20,000-30,000 N. Pintail, a number regarded as low for the region [Sheryl Forte, *vide* Ward Dasey].) Other birds present April 4, 1992, included 2 Turkey Vulture, Winter Wren, 3 Golden-crowned Kinglet, 3 N. Cardinal, 4 Carolina Wren, 30 Com. Grackle, 3 Rusty Blackbird, and a few Red-winged Blackbird. Also on the edges of the Marsh were 4 or 5 singing White-throated Sparrow. At the Harrisonville Bridge were Greater Yellowlegs, Am. Kestrel, 6 Am. Black Duck, N. Flicker, 3 Am. Robin, 3 Carolina Wren, 4 N. Cardinal, N. Mockingbird, and 2 Song Sparrow. No herps were evident in the cold. There were also 20 female Red-winged Blackbirds in a migrant flock.

On the causeway April 8, 1992 were Tundra Swan, 250 Snow Geese (overhead), Wood Duck, 350 Green-winged Teal, 20 Blue-winged Teal, 2 Com. Moorhen, 2 Lesser Golden Plover, 250 Greater Yellowlegs, 235 Lesser Yellowlegs, 200+ Pectoral Sandpiper, 1 Ruff and 1 Reeve (Ward Dasey, et al.), 20+ Com. Snipe, 4 Ring-billed Gull, 3 Barn Swallow, 75 Red-winged Blackbird, and 2 Rusty Blackbird. Falling tide made shorebird counting difficult. There were probably more birds. Many muskrats were in view.

A visit to the causeway in the rain on high tide May 8, 1992 produced 5 Snowy Egrets, Killdeer, 2 Lesser Yellowlegs, Reeve, Com. Snipe, 3 Laughing and 3 Great Black-backed gull, 20 feeding Forster's Tern, 3 Purple Martin, Yellow Warbler, and 2 Red-winged Blackbird. Muskrat houses were many.

Photographs were taken of the marsh from the Pedricktown Causeway on May 27, 1992. With the height of the vegetation, no waterbirds could be seen.

On the visit June 10, 1992, snapping turtle, woodchuck, opossum, and muskrat were on site. Resident birds that day included Great Egret, Willow Flycatcher, E. Kingbird, Wood Thrush, Am. Robin, Carolina Wren, N. Cardinal, Red-winged Blackbird, N. Oriole, Com. Grackle, and on the edges, Yellow Warbler and Com Yellowthroat, Mourning Dove, and N. Mockingbird.

Lower Oldmans Creek, lower Raccoon Creek, and Delaware River complex. During the winter and early spring (January through March) a massive concentration of waterfowl occurs in this complex. Maximum counts of N. Pintail and Am. Black Duck have been as great as 60,000 and 20,000 respectively. The peak seems to occur in late February. In mild winters, N. Pintail overwinter. At this time the waterfowl may be feeding on gastropods that dwell in the benthic part of the wild rice fields. These concentrations are threatened by oil spills in the Delaware River, which would affect the tidal portions of these creeks. It is in the wild rice fields close to Route 130 that these waterfowl are feeding. Many of these birds loaf or rest on the river when the tide precludes foraging in the creeks. (Sheryl Forte, Ward Dasey, pers. comm.)

Conservation: Priority 1,3,4,5,6,7,10,11,13,14,15 - Score = 11. The Pedricktown Complex is one of the most important sites in the region. With federal and state endangered species, with critical migrant populations, and abundant food, it is a critical migratory and wintering stopover site for many species. It is adjacent to and partly includes large federal holdings (Department of the Army). It is threatened by a 350 acre development parcel (see above) on Route 130 and by an extension of the large industrial complex at Pureland. It has good access from the causeway of Pedricktown Road and boat access could be established. It gets very heavy birding use from January to May, and also is utilized by hunters, fishermen, and trappers. Probably the greatest need is to ensure the integrity of the upland buffers around the site, which can be partly done by CAFRA. But the best outcome would be to acquire the large 350 acre fill for sale at Route 130 and let it undergo succession. The area between Route 130 and Route 295 requires buffer protection. Cooperation between federal and state agencies is necessary to convert the *Phragmites* spoil at the mouth of the creek into useful habitat. One impoundment created during dredge deposition is useful waterbird habitat. Since the river needs to be dredged periodically for navigation, there will be a continuous supply of spoil habitat that can be made beneficial for N. harrier (E), Short-eared Owl (E), herons, various waterfowl, and rails. A combination of acquisition and management is required for this site.

39. Oldmans Creek: (From Route 295 to New Jersey Turnpike between Route 602 Salem and Route 602 Gloucester County). This portion of Oldmans Creek is forested along the banks at the back of private properties, mostly farms and some developments which appear to be sold-off portions of existing farms. Thus far, the farm properties, which often extend to the creek, have protected the forest corridor along the creek. There is little access to the creek except at the few road crossings. Site visits were made on July 12, September 6, October 3, December 6, March 5, 1991, and January 10, February 13, April 4, May 8, and June 10, 1992.

Within this section of Oldmans Creek at Route 551 on the Gloucester County side of the creek is a marsh of cattail and arrow arum used by Great Blue Heron (T), Great Egret and Red-winged Blackbirds. There is a tributary on the Gloucester side between two peach orchards. The forest belt preserves the water quality of the stream. The best hope for this linear habitat is probably that both sides remain in farming.

Botanical Description: Where Route 551 crosses Oldmans Creek, the corridor forest includes red oak, scarlet oak, red ash (*Fraxinus pensylvanica*), sour gum, and black cherry, with a dense understory of arrowwood, Virginia creeper, wild grape (*Vitis riparia*), silky dogwood, Japanese honeysuckle, and poison ivy. An open floodplain meadow here has a cover of tearthumbs (*Polygonum sp.*), stillgrass, jewelweed, arrowhead, and bur-marigold.



THE GRADUATE COLLEGE OF MARINE STUDIES, LEWES DE 19958

JONATHAN H. SHARP, PROFESSOR  
(302) 645-4259 (OFFICE)  
(302) 645-4007 (FACSIMILE)  
INTERNET: jsharp@udel.edu

February 7, 1997

Mr. Robert L. Callegari  
Chief, Planning Division  
Environmental Resources Branch  
Department of the Army  
Philadelphia District, Corp of Engineers  
100 Penn Square  
Philadelphia, PA 19107-3390

Dear Mr. Callegari:

I received the Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project after I returned from my Christmas vacation. I have not had sufficient time to study this large document and hence cannot render adequate comment on it. I request a longer review period for comments.

1.

I also request that the Corps hold an interactive discussion with the local community on the entire project. Despite many public presentations and meetings open to the public, there has been precious little opportunity for the public to interact by receiving coherent information and being able to ask questions that receive direct responses.

2.

I have tried to review earlier aspects of this project and have commented on some of these. I realize that the Army Corps of Engineers has probably done all the proper legal moves required for project review. However, this project has not received the necessary local review for the community of knowledgeable and concerned citizens to be confident that the project does not pose significant environmental threat. My professional responsibilities involve research and teaching in environmental science. However, I have dedicated many hundreds of hours in the past half decade to public involvement on the Delaware Estuary through the Delaware Estuary Program where I was previously Chairman of the Scientific and Technical Advisory Committee. Although the Corps sat on the Delaware Estuary Program Management Committee, there was little real interactive participation. I would characterize the Corps presence as either quietly watching or presenting long detailed uninformative barrages of project details and being unable or unwilling to answer any questions directly.

3.

I have not seen evidence that comments that I sent earlier to the Corps have been addressed, have been answered, or have had any impact. I sent comments on the original EIS on behalf of the Delaware Estuary Program and comments to those involved with the 3D model on behalf of an ad hoc group of physical oceanographers and modelers.

4.

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

1. Dr. Sharp was notified that the comment period had been extended.

2. Numerous meetings were held with local communities.

3. In late 1992, during the early stages of the final design efforts, the Corps made a presentation to the Delaware Estuary Committee on the study scope, work efforts, schedule and completion. For the salinity modelling efforts portion of the study area, six workshops were held by the Philadelphia District, to which interested persons were invited to participate in the scoping, development and review of model results. Dr. Sharp as well as all interested parties were invited to these workshops.

4. Responses to Dr. Sharp's comments on the original EIS are contained in the 1992 Feasibility Report. Concerning the 3-D modelling, Dr. Sharp attended initial 3-D modelling meeting held in July 1992 as well as the academic and private-sector investigators working on Delaware Estuary hydraulics and physical oceanography. There was useful discussion on several aspects of Delaware Bay circulation and salinity at the meeting. Attendees at this meeting were invited, by coordination letters, to participate in all subsequent workshops on the salinity modeling held at the Philadelphia District offices between 1992 and 1995.

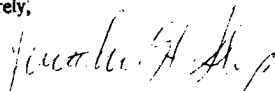
Dr. Sharp's criticism of the modeling approach adopted by the Corps of Engineers for the Delaware River Main Channel Deepening Study was noted. Many of the issues raised by Dr. Sharp were addressed in a December 1993 letter from Dr. Billy Johnson, the principal investigator for the Corps Waterways Experiment Station (WES) modeling, to Dr. Sharp. The letter documented some of the reasons for selection of the CH3D model, and included an offer to further discuss these matters either by phone, or by visiting Dr. Sharp's office for a personal briefing. Dr. Sharp did not respond to Dr. Johnson's letter, nor did he attend any subsequent workshops on the modeling. The District and WES continue to believe that the modeling performed for the proposed deepening represented a significant and serious commitment by the Corps of Engineers to comprehensively address questions and issues related to the proposed channel deepening.



I now serve as Chairman of the Board of Directors of the Partnership for the Delaware Estuary which is a non-profit group dedicated to assist in the public input in implementing the Delaware Estuary Management Plan. The Partnership has a diverse Board of Directors representing conservation organizations, regional planning organizations, industry, academic institutions, and local governments. Since the Partnership Board has just formed and has such a diverse background, I cannot represent this group with any opinions on the Deepening Project. However, I feel confident that I can represent the Partnership in calling for a more open review, discussion, and interaction by the Army Corps of Engineers with the local community before actual construction starts.

Again, I request that a more open forum be planned for interactive review and discussion of the project.

Sincerely,



Jonathan H. Sharp  
Professor of Oceanography



One Logan Square  
Philadelphia, PA 19103  
215-864-1200  
800-523-4511

**VIA HAND DELIVERY**

February 18, 1997

Mr. Robert L. Callegari  
Attn: Environmental Resources Branch  
U.S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390

RE: Delaware River Main Channel Deepening Project

Dear Mr. Callegari:

Maritrans Inc. ("Maritrans") transmits herewith the attached comments on the Draft Supplemental Environmental Impact Statement ("DSEIS") prepared by the U.S. Army Corps of Engineers-Philadelphia District (the "Corps") for the proposed Delaware River Main Channel Deepening Project (the "Project"). The Project generally provides for the deepening of main channel of the Delaware River from its existing depth of 40± feet to 45± feet. These comments are submitted in response to the Corps' Public Notice of the availability of the DSEIS dated January 3, 1997.<sup>1</sup>

As you may know, Maritrans is a Philadelphia-based maritime company which transports petroleum by barge and employs approximately 500 people. Maritrans owns and operates tugs and barges which carry petroleum in the Philadelphia harbor, the Delaware River and Bay, and along the U.S. Atlantic and Gulf coasts. Locally, Maritrans serves the refineries located along the Delaware River and knows the dynamics of the Delaware Valley refining industry. Maritrans' barges lighter (i.e., partially unload) crude oil tankers at the mouth of the Delaware Bay, which then proceed to the refineries along the Delaware River and off-load. Most importantly, Maritrans is a member of the Delaware River Port community, and wants the Ports of Philadelphia and Camden to succeed.

<sup>1</sup> As was confirmed with you in a letter from our attorneys dated February 7, 1997, the end of the comment period for the DSEIS is February 18, 1997, rather than the February 17, 1997 date listed on the Public Notice, due to a federal holiday falling on February 17, 1997.

Mr. Robert L. Callegari  
February 18, 1997  
Page -2-

Maritrans has engaged the firm of Manko, Gold & Katcher to assist us in this matter. As you know, they have submitted several Freedom of Information Act ("FOIA") requests to the Corps to review documentation associated with the Project. Although documentation has been supplied by the Corps in response to the FOIA requests, we do not believe that all records responsive to the prior FOIA request have been made available by the Corps for review. Therefore, by letter dated February 5, 1997, our attorneys have filed an administrative appeal of the Corps' FOIA responses. In addition, our attorneys have also recently submitted additional FOIA requests to the Corps, to which we are currently waiting for a reply. We reserve the right to supplement these comments with any information that will be provided to us by the Corps in the future.

Thank you for the opportunity to submit these comments.

Very truly yours,

John C. Newcomb

Enclosure

**COMMENTS TO THE  
DELAWARE RIVER MAIN CHANNEL DEEPENING PROJECT  
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT**

Submitted by Maritrans, Inc.  
February 18, 1997

**I. INTRODUCTION**

By Public Notice No. CENAP-PL-3-07-01 dated January 3, 1997, the Philadelphia District of the United States Army Corps of Engineers (the "Corps") gave notice of the completion of a Draft Supplemental Environmental Impact Statement dated January 1997 (the "DSEIS") for the Delaware River Main Channel Deepening Project (the "Project"). The Public Notice also stated that the DSEIS was being circulated to public and private organization for their review and comment. Included within the DSEIS circulated for public comment was a section entitled "Section 404(b)(1) Evaluation."

The Project proposes to modify the depth of the existing navigation channel from 40 to 45 feet at mean low water from Delaware Bay to Philadelphia Harbor and Beckett Street Terminal, Camden, New Jersey. The Project includes no changes in existing channel widths, excepting for channel bend widenings. The Corps estimates that the Project would create 33.4 million cubic yards of dredge material for initial project construction, with an additional 229,000 cubic yards of rock removed from the channel by blasting and mechanical methods in the vicinity of Marcus Hook, Pennsylvania. The Corps also estimates that the annual amount of maintenance dredging of the 45 foot channel would be 6,007,000 cubic yards, increased from the current 4,888,000 cubic yards for the 40 foot channel, for a net annual increase of 1,119,000 cubic yards of dredged material.

A key component of the Project is the provision for the disposal of the significant amount of dredged material the

Project will create. The Project includes the creation of four new dredged material disposal sites located on upland/wetland areas in New Jersey.

Maritrans, Inc. ("Maritrans") is a Philadelphia-based maritime company which transports petroleum by barge and employs approximately 500 people. Maritrans owns and operates tugs and barges which carry petroleum in the Philadelphia harbor, the Delaware River and Bay, and along the U.S. Atlantic and Gulf coasts. Maritrans' barges lighter (e.g., partially unload) crude oil tankers at the mouth of the Delaware Bay, which then proceed to the refineries along the Delaware River and off-load. Locally, Maritrans knows the dynamics of the Delaware Valley refining industry as the single largest lighterer in the Delaware Bay. Most importantly, Maritrans is a member of the Delaware River Port community, and wants the Port of Philadelphia and Camden to succeed.

Maritrans' comments on the DSEIS are divided into the following two sections.

- (A) The Corps Has Overestimated the Benefits of the Project, and Therefore Failed to Properly Consider and Evaluate the No Build Alternative.
- (B) The DSEIS Minimizes the Impact the Four Proposed Upland Disposal Facilities will have on the Environment.

## II. COMMENTS

- A. The Corps Has Overestimated the Benefits of the Project, and Therefore Failed to Properly Consider and Evaluate the No Build Alternative.

### 1. Regulatory Background.

Pursuant to Section 102 of the National Environmental Policy Act ("NEPA"), environmental impact statements prepared for major federal actions must include a description of alternatives to the proposed action. 42 U.S.C. § 4322(C)(iii). The regulations developed pursuant to NEPA state that the section discussing alternatives "is the heart of the environmental impact statement." 40 C.F.R. § 1502.14. These regulations further require that agencies must "rigorously explore and objectively evaluate all reasonable alternatives," "include reasonable alternatives not within the jurisdiction of the lead agency," and "include the alternative of no action." *Id.* at § 1502.14(a), (c) and (d). Similarly, the guidelines developed pursuant to the Section 404 regulatory program (the "Guidelines") of the federal Clean Water Act require a finding that there is "no practicable alternative" to a proposed discharge of dredged or fill material in waters of the United States which would have less impact on the aquatic ecosystem. 40 C.F.R. § 230.10(a). Therefore, for major federal projects involving the discharge of dredged or fill material into waters of the United States, NEPA requires that agencies "rigorously explore and objectively evaluate all reasonable alternatives," and the Guidelines require a showing that there is "no practicable alternative to the proposed

discharge which would have less adverse impact on the aquatic ecosystem."

As noted above, included within the DSEIS circulated for public comment was a section entitled "Section 404(b)(1) Evaluation." The inclusion of this section in the DSEIS is required by Section 404(r) of the federal Clean Water Act, which specifically exempts from Section 404 regulation "[t]he discharge of dredged or fill material as part of the construction of the Federal project specifically authorized by Congress . . . if information on the effects of such discharge, including consideration of the guidelines developed under subsection (b)(1) of this section, is included in an environmental impact statement for such a project." 33 U.S.C. § 1344(r). Likewise, the Corps own regulations specify that "[a]lthough the Corps does not process and issue [Section 404] permits for its own activities, the Corps authorizes its own discharges of dredged or fill material by applying all applicable substantive legal requirements, including public notice, opportunity for public hearing, and application of the section 404(b)(1) guidelines." 33 C.F.R. § 336.1(a).

With respect to the Project, both the dredging of the main channel, which includes the mechanical excavation of rock near Marcus Hook, and the filling of wetlands to create new dredged material disposal sites, require the consideration of alternatives pursuant to NEPA and the Guidelines. However, the Section 404(b)(1) Evaluation contained in the DSEIS only

considers the dredged material disposal sites, and not the dredging of the main channel. The following comments on the Corp's evaluation of the No-Build Alternative are therefore submitted pursuant to the consideration of alternatives required by NEPA and the Guidelines, as purportedly included in the Section 404(b)(1) Evaluation found within the DSEIS circulated for public comment.

2. **An Accurate Benefit-Cost Analysis of the Project Demonstrates Its Estimated Costs Exceed Its Anticipated Benefits.**

a. **Introduction.**

In a document dated March 1996 and attached hereto as Exhibit "A," Maritrans critiqued the benefit-cost ratio found in the Project Feasibility Report.<sup>1</sup> The Corps estimates that the reduction in crude oil lightering caused by the Project will generate 79% of the Project's purported benefits. However, the report attached as Exhibit "A" demonstrates that the growth in crude oil imports has not occurred as anticipated by the Corps, and will not occur in the future at the levels projected by the Corps. Therefore, a more accurate estimate of the benefit-cost ratio for the Project is 0.43, well below the "break even" ratio

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<sup>1</sup> In its Design Memorandum for the Project dated May 1996, the Corps slightly adjusted its estimate of the annual benefits and costs of the Project, but kept the benefit to cost ratio at 1.3 to 1.0. The Design Memorandum does not address the comments made herein regarding the Corps' analysis of the benefit to cost ratio.

of 1.0, and therefore insufficient to make the Project economically sound.<sup>2</sup>

b. The Corps Grossly Overstates the Growth in Crude Oil Imported for Use by Delaware River Refineries.

As described in the attached Exhibit "A" there are several errors in the Corps' benefit-cost calculations. First, the Corps grossly overstates the growth of crude oil to be imported for use by the refineries located along the Delaware River, particularly in the early years of the Project. In making its projections of growth of imported crude oil, the Corps did not consider that, during its study period, Delaware Valley refineries were running at or close to full capacity. Significant increases in crude oil volumes as projected by the Corps would require either substantial new refinery capacity (which would require the construction of additional refineries costing \$1 billion plus each), and/or increasing capacity by technological improvements to existing refineries (which, as acknowledged by the Corps' consultant, could only increase capacity modestly). There are no significant refinery capacity expansions planned for the Delaware Valley refineries, and in fact, recent sales of three refineries were concluded at a price equal to only 5 to 15% of their replacement cost.

In addition, the Corps' estimated current annual increase of 2.7% in crude oil imports into the Delaware Valley

<sup>2</sup> At a benefit-cost ratio of 0.43, every \$1.00 spent results in 43¢ worth of benefit.

refineries appears to be based, in part, on a projected 3.2% annual increase in crude oil imported into the United States. This percentage increase approximates the increases in crude oil imports on a national level primarily because imported crude oil has replaced domestic crude oil as a refinery feedstock, and not because of increased demand. Unlike the national situation, the Delaware Valley refineries which purportedly will benefit from the Project already run on 100% imported crude oil, so there can be no increase in imported crude oil based upon its use as a replacement to domestic crude oil.

Based on these factors, the proper escalator for crude oil imports into the Delaware Valley refineries after 1995 is 0.8% annually, rather than the Corps' estimate of 2.7% annually.

c. The Corps Used a Lightering Rate to Compute Project Benefits That Is in Excess of the Actual Lightering Rate.

The second error in the Corps' calculation of the benefit-cost ratio for the Project was its use of a lightering rate of 40¢ per barrel in computing benefits from reduced lightering. Actual lightering costs charged by Maritrans are proprietary. For the period between 1992 through 1994, inclusive, the actual weighted average for lightering costs was less than 40¢ per barrel. However, the Corps used the 40¢ per barrel lightering figure to obtain an estimate of benefits which were greater than what would be achieved.

- d. In Computing Project Benefits, the Corps Overestimated the Amount of Crude Oil That Is Currently Lightered.

In its estimates of Project benefits, the Corps assumed that 31% of the crude oil coming into the Delaware Bay is lightered. Based on Maritrans' lightering records for the period of 1992 to 1994, the proper figure for the percent of crude oil lightered is 29%. This actual number, which is lower than estimated by the Corps, would also reduce the purported benefits accruing from the Project.

- e. The Corps Has Overestimated the Number of Refineries Purportedly Benefitting From the Project, Thereby Significantly Exaggerating the Project's Benefits.

In determining the purported benefits of the Project, the Corps has overstated the number of benefitting refineries, thus overstating very significantly the lightering benefits of the Project to Delaware Valley refineries. The Corps has stated variously that five or six refineries would benefit from the Project. Maritrans believes that only three refineries would benefit; namely, Coastal-Eagle Point, Sun-Fort Mifflin, and Sun-Hogg Island.

The Corps also grossly understated the hookup costs to be encountered by the refineries to access the deepened main channel created by the Project. Although not included in its corrected benefit-cost ratio, the estimated hookup cost attributable to the Tosco refinery (formerly B.P. Marcus Hook) and Sun's refineries (e.g., for deepened private channels and docks, etc.) are in the \$73 million range, far more than the \$23

million projected in the Corps' calculations to be required from all Project beneficiaries. Further, Maritrans believes that the Corps has ignored the required costs associated with "benefits" accruing to non-petroleum users, which costs are associated with giant cranes and huge marshalling areas needed for super-container ships.

- f. The Corps Incorrectly Assumed the Project Would Result in a Time Savings to the Delaware Valley Refineries From a More Efficient Lightering System.

The Corps incorrectly calculated that the Project will result in time "savings" to the refineries by creating a more efficient lightering system, which savings the Corps calculated would result in benefits of \$1.7 million annually. The Corps' methodology mistakenly assumes that the same lightering system will exist after the completion of the Project as existed before, particularly with regard to the number of Maritrans' lightering vessels. Since lightering demand will be reduced by some percentage (which Maritrans estimates at 20%), Maritrans will be forced to reduce its lightering fleet by 20%, or one vessel unit. The ratio of lightering needs versus lightering vessels will therefore remain the same, and no "efficiencies" will materialize.

- g. The Corps Overstated the Purported Benefits of the Project to Non-Petroleum Containing Vessels.

The Corps has also concluded that the Project will not induce increased tonnage into the Ports of Philadelphia and Camden, a statement which is not disputed, due in part to the

limited depths of southern hemisphere ports and the need for vessels to be able to transit the Panama Canal. With regard to the trade in scrap metals, the Corps projected that 11½ of the Project benefits would be associated with increased scrap trade because the scrap ports in Turkey can receive vessels with up to 70 foot drafts. After checking the drafts of the six scrap-receiving ports in Turkey, along with five other scrap processing countries, it was determined that only one of the six ports in Turkey had a draft of 65 feet. Out of all the scrap ports in the world, the Corps must have based the entire benefit of the Project attributable to increases in the trade of scrap metals to this one port in Turkey. The benefit assigned by the Corps to any increases in scrap trade is therefore obviously overstated.

**h. The Benefit-Cost Ratio for the Project Is Less Than 1.0, Making the Project Economically Unsound.**

Therefore, as shown by the calculations contained in Exhibit "A," the growth in crude oil to be imported into the Delaware Valley has not materialized and will not materialize in the future to justify a \$300 million plus project. The actual ratio of combined benefits to petroleum and non-petroleum cargoes to the costs of the Project (not including more accurate and higher costs for refineries to hookup to the Project) is estimated at 0.43, well below the "break even" ratio of 1.0, and thus, insufficient to make the Project economically sound and worthwhile.

**3. The Corps' Economic Analysis Has Ignored Adverse Impacts to the Local Economy Created by the Project.**

In the documents prepared by a consultant to the Corps with regard to the Project, the Corps' consultant investigated the effect on the local economy from the reduction in lightering caused by the Project. In this report, entitled "DRPA Organization, Financial Capacity and Financing Options for Local Sponsor Cost Sharing and Local Impacts of the Delaware River Main Channel Deepening Project" (Draft) (December 28, 1995), the Corps' consultant assumed that there would be no change in the volume of transported cargoes with or without the Project.

Another assumption the Corps' consultant considered in this report was "who will be affected by the cost savings that result from the reduction in lightering." In determining who would be affected by a reduction in the demand for lightering services, the report stated the following:

If the present practice is that the recipients of lightered cargoes pay the full costs of the lightering, then a reduction in lightering is a reduction in costs for the firms whose cargoes are lightered less. Thus, in one view, the savings, which are really the avoided costs of lightering, are just a transfer of income from the lightering firms (barges and tugs) to the firms paying for the transportation of the cargoes. In this view there would probably be a small negative effect on the economy of the region because the lightering firms spend more of their receipts in the region than do the firms whose cargoes are lightered. In another view, and one which is adopted for



this analysis, the lightering firms' incomes will not be affected because they will adjust their prices on the balance of their services to restore their incomes to the levels prevailing before the reduction in lightering. The savings in transportation costs will affect the firms that no longer have to pay for lightering or shipping their cargoes, such as oil refineries and containerized shipping companies. (emphasis added).

(A copy of the title page, table of contents, and the specific section of this report containing the section quoted above is attached hereto as Exhibit "B.")

The analysis as quoted above recognizes the possibility of a negative effect on the regional economy created by the Project due to a reduction in the demand for lightering services. The report did not adopt this analysis, however, but instead assumed, unrealistically, that after completion of the Project lightering firms such as Maritrans would increase their lightering prices on the "balance of their services to restore their incomes to levels prevailing before the reduction in lightering." (It is interesting to note that the Corps has not considered, as a "cost" attributed to the Project, an increase in prices for lightering services as upon the completion of the Project, as this analysis suggests would occur.) The assumption made in this analysis is unrealistic given the market for lightering services, and shows that the Corps analysis has ignored adverse impacts to the local economy created by the Project. This situation further calls into question the validity

of the economic analysis performed by the Corps in support of the Project.

4. The Project Is Not Needed on the Basis of a Reduction in the Potential for Oil Spills During Lightering.

Section 12 of the DSEIS concerns oil spill coordination/contingency planning. This section generally describes the Philadelphia Area Oil Spill Contingency Plan and its adequacy for different size spills in the Delaware River. This section of the DSEIS acknowledges that the current main shipping channel of the Delaware River is "safe," with "few oil spills occurring in the waterway." DSEIS at 12-6. Similarly, the Final Environmental Impact Statement prepared for the Project states at page 99 that lightering transfer accidents in the Delaware River "occur at a rate one-half of the national average of 8 accidents per 1,000 transfers." The Corps also estimates that the national average for lightering spills is about 32 gallons.

However, the DSEIS implies that there are a large number of oil spills occurring during lightering in the Delaware River, by reporting that a Coast Guard representative stated that "there are approximately 600 spills reported annually. This number includes spills from lightering operations as well as smaller incidents such as recreational boaters reporting an oil sheen on the river." DSEIS at 12-6. The DSEIS thereafter incorrectly states that the Project will reduce the likelihood of oil spills because of the expected reduction in lightering

operations. (Both the Corps and Maritrans agree that the same number of vessels will be lightered after completion of the Project as are currently lightered, but each vessel will be lightered less.) As shown on the chart below, the lightering conducted by Maritrans in the Delaware River for the last seven years indicates an extremely safe and practically spill-free operation. In fact, according to these records, only five gallons of crude oil have been spilled into the Delaware River from Maritrans' lightering operations during a time period where Maritrans lightered over 668 million barrels of crude oil. (Since one barrel contains 42 gallons, the total gallons lightered by Maritrans over this time period is over 28 billion gallons.) Therefore, the statement found in the DSEIS that the Project is expected to reduce the "likelihood of oil spills" does not acknowledge the facts, shown by existing data, that lightering operations do not currently cause oil spills in the Delaware River.

**MARITRANS' LIGHTERING RECORD**

<u>YEAR</u>	<u>AMOUNT LIGHTERED</u>	<u>AMOUNT SPILLED</u>
1990	106,000,000 bbls.*	-0-
1991	96,000,000 bbls.	5 gallons
1992	96,000,000 bbls.	-0-
1993	98,000,000 bbls.	-0-
1994	95,000,000 bbls.	-0-
1995	92,300,000 bbls.	-0-
1996	84,800,000 bbls.	-0-

\* One barrel contains 42 gallons.

In fact, the Project will, in all probability, increase the likelihood that a major oil spill will occur, since the Corps estimates that large tankers, which historically have been a source of major oil spills, containing more crude oil will navigate directly to the Delaware Valley refineries. This situation could be worse, from an oil spill planning perspective, than the current system because the Corps admits in the DSEIS that, although the Coast Guard believes that the current oil spill plan is adequate to respond to the maximum most probable discharge, it is inadequate to respond to the worst case spill. A deepened Delaware River main channel created by the Project may, in fact, increase the probability that a worst case spill could occur.

**B. The DSEIS Minimizes the Impact the Four Proposed Upland Disposal Facilities Will Have on the Environment.**

**1. The Corps Incorrectly Concluded That the Contaminants in the Delaware River Sediments Do Not Pose Any Environmental Risks.**

In the DSEIS, the Corps concluded that the environmental risks associated with the contaminants in the dredged sediments are relatively low and that the disposal of these sediments in the proposed dredged material disposal facilities should not present a significant concern. In reaching this conclusion, the Corps compared the mean levels of contaminants in the channel sediments with the New Jersey Department of Environmental Protection's ("NJDEP") Residential Direct Contact Soil Cleanup Criteria and NJDEP's Impact to Ground Water Soil Cleanup Criteria. From its analysis, the Corps

determined that the mean concentration of sediment contaminants were, with two exceptions (cadmium and selenium), below NJDEP's Residential Direct Contact Soil Cleanup Criteria, and were, without exception, at levels below NJDEP's Impact to Ground Water Soil Cleanup Criteria. From this comparison, the Corps concluded that the contaminants in the sediments do not pose any environmental risks and that disposal of these sediments in the proposed dredged material disposal facilities would not impact groundwater.

The Corps' conclusion is flawed for a number of reasons. First, the Corps used mean concentrations when analyzing sediment quality data instead of the actual concentrations of contaminants detected in the sediment samples. This analysis masked any hot spots or concentrations of contaminants in the Delaware River channel sediments. Second, the Corp's analysis of the sediment contaminant's impact on groundwater relied upon NJDEP criteria which do not contain any standards for heavy metals. Therefore, the Corps failed to examine the impact that heavy metal contaminants in the sediments will have on groundwater when the sediments are placed in dredged material disposal facilities. Finally, the DSEIS did not consider a recent study which concluded that sediment contaminants have a significant impact on the environment. Accordingly, the Corps must re-evaluate its conclusion that the environmental risks posed by the contaminants in the Delaware River sediments are minimal.

a. The Corps Ignored the Environmental Risks Posed by Contamination in the Delaware River Channel Sediments by Using Mean Concentrations in its Analysis of Sediment Quality.

In analyzing sediment quality data to determine whether upland disposal of the dredged Delaware River sediments would pose any environmental risks, the Corps used mean concentrations rather than the actual concentrations detected in the sediments. By using a mean concentration for its analysis, the Corps successfully disguised many hot spots of contamination found in the sampled dredged sediments. The data provided in the DSEIS demonstrates that, for a number of samples from all five reaches of the Delaware River which the Corps investigated, the levels of contaminants exceeded NJDEP's Residential Direct Contact Soil Cleanup Criteria. Exhibit "C" attached hereto compares NJDEP's Residential Direct Contact Soil Cleanup Criteria with the maximum concentration of certain contaminants detected in the sediments from each of the five reaches as reported by the Corps in the DSEIS. (NJDEP's Residential Direct Contact Soil Cleanup Criteria were published in the April, 1994 NJDEP Site Remediation News at pp. 17-19. The Criteria are attached hereto as Exhibit "D".) From this comparison, it is apparent that the sediments contain significant levels of antimony, arsenic, beryllium, cadmium, lead, selenium, thallium, PCBs, benzo(a)pyrene, benzo(k)fluoranthene, and benzo(a)anthracene. The contaminants found in these hot spots in the Delaware River channel may significantly impact the environment when these sediments are

dredged and disposed of in dredged material disposal facilities. Accordingly, the Corps must reevaluate its conclusion that the dredging and disposal of Delaware River sediments will not impact the environment in light of these hot spots in the channel.

- b. The Corps Failed to Consider the Impact that Heavy Metals Present in the Delaware River Sediment Will Have on Groundwater When the Sediments are Disposed of in a Dredged Material Disposal Facility.

The Corps' conclusion that the disposal of the dredged material will not have an impact on groundwater is flawed because NJDEP has not yet calculated cleanup criteria for heavy metals. The Corps based its conclusion upon a comparison of the mean contaminant concentrations found in its samples with NJDEP's Impact to Ground Water Soil Cleanup Criteria. These criteria do not currently contain any standards for heavy metals. See Exhibit "D" at pp. 17-19 (noting in footnote H that impact to groundwater values for inorganics will be developed based upon site specific chemical and physical parameters). Therefore, with respect to the impact of heavy metals on groundwater, the Corps' comparison is meaningless. The proposed dredged material disposal facilities are in close proximity to recharge areas for potable water supplies serving southern New Jersey communities. In the DSEIS, the Corps did not evaluate whether heavy metals in the dredged material would pose a risk to ground water and, therefore, improperly concluded that the heavy metals in the sediments will not have an impact on groundwater and drinking water supplies when the dredged material is disposed of in the

disposal areas. Accordingly, the Corps must evaluate whether the heavy metals which are present in the Delaware River sediments will impact groundwater when they are placed in the proposed dredged material disposal facilities.

- c. A Recent Study Demonstrates that the Delaware River Sediments Contain Significant Levels of Contaminants which Pose Serious Environmental Risks.

In reaching its conclusion that the environmental risks posed by contaminants present in the Delaware River sediments are minimal, the DSEIS did not reference a recent study which demonstrates that the contaminants present in Delaware River sediments have a significant impact on the environment. A June 4, 1994 study entitled "Distribution of Chemical Contaminants and Acute Toxicity in Delaware River Estuary Sediments," completed by Arthur D. Little for the United States Environmental Protection Agency and the Delaware River Basin Commission concluded that acute sediment toxicity is more widespread throughout the Delaware River estuary than previously believed. (The executive summary of this report is attached hereto as Exhibit "E") The study found that amphipod mortality rates exceeded 50% when exposed to sediments from certain areas in Reaches A, B and C. The study found high levels of heavy metals, PCBs, pesticides and their metabolites, (including dieldrin, DDT, DDE, and DDD) and polycyclic aromatic hydrocarbons in sediments from Reaches A and B. The study concluded that PCBs, DDT and related pesticides are far more widespread in the Delaware River than previously believed.

The DSEIS makes no mention of these studies and, indeed, seems to draw a contrary conclusion.

As the Corps noted in the DSEIS, contaminants in the sediment can impact the environment in a variety of ways. First, turbidity at the point of dredging and in the areas where the dredged sediments are discharged can degrade water quality as the contaminants leach into the water from the suspended sediments. DSEIS at 4-1. Second, the contaminants in the sediments and/or released into surface waters may be ingested by plants and animals and bioaccumulate in the food chain. DSEIS at 4-1 to 4-2. Finally, the contaminants can impact groundwater quality as they leach from the sediments in the upland disposal areas. DSEIS at 4-1 to 4-2. By using mean levels of contaminants, rather than the actual levels sampled, and by ignoring published studies, the Corps has seriously underestimated the environmental risks posed by Project and by the disposal of dredged material in the proposed disposal facilities.

**2. The Corps Improperly Failed to Perform a Bioaccumulation Study for Sediments Dredged From Reaches A, B, C and D.**

In the DSEIS, the Corps did not sufficiently evaluate whether contaminants from the dredged material could bioaccumulate. As discussed in the preceding section, it is clear that there are significant levels of contamination present in the dredged material found in all reaches of the Delaware River to be affected by the Project. Although the Corps performed a bioaccumulation study on sediments from Reach E, the

Corps did not perform a bioaccumulation study for Delaware River sediments from Reaches A, B, C, and D. The Corps concluded that study of these sediments was not necessary because these sediments would be removed from the aquatic environment and disposed of at an upland disposal facility. However, the Corps failed to consider that the contaminants present in the sediments will be bioavailable for uptake by plants and animals both during the dredging process and after the dredged sediments are placed in a dredged material disposal facility. Given that a number of endangered and threatened species, including the bald eagle and the peregrine falcon, use the Delaware River estuary for breeding, nesting and feeding, the Corps needs to fully evaluate whether the contaminants from sediments in Reaches A, B, C and D will impact local wildlife thorough bioaccumulation. The bioaccumulation studies performed on sediments from Reach E are not useful for evaluating the impact of contaminants in sediments from Reaches A, B, C and D because these sediments contain higher levels of contaminants than sediments in Reach E due to their proximity to historically heavily industrialized areas.

Contaminants from the Delaware River sediments can be released into the local environment and made bioavailable by the Project in a number of ways. First, when the sediments are initially removed from the river bottom, the dredging activities will cause some of the sediments to become suspended in the river water. Contaminants can then leach from the suspended sediments into the water and are bioavailable in the local environment.

Second, when the dredged sediments are deposited in the rehandling basin, the sediments are again suspended in the water and contaminants will leach from the sediments into the waters of the rehandling basin. These contaminants would then be bioavailable and may have a significant impact on the local environment in and around the rehandling basin.

Third, when the sediments are placed in an upland disposal facility, contaminants would be released whenever water comes into contact with the dredged sediments. Runoff from the facilities will contain contaminants leached from the sediment and will impact surrounding surface water bodies. Several of the proposed dredged material disposal facilities have adjacent tidal marshes and streams that are of exceptional value to fish and wildlife resources, and that may be adversely affected by runoff from the disposal facilities and by changes in water quality in the rehandling basin.

Finally, the Corps intends to rotate disposal activities at the four proposed upland disposal facilities in order to create temporary wetlands in the areas which are not in use. These temporary wetlands will exist directly on top of the dredged material. The Corps expects that these temporary wetlands will provide a habitat for local wildlife. The contaminants present in the sediment may leach into the ponded water created on top of the dredged material and will therefore be bioavailable.

In sum, the Corps' conclusion that a bioaccumulation study of the contaminants present in sediments from Reaches A, B, C, and D is not necessary because these sediments will be removed from the aquatic environment is incorrect. Despite disposal in dredged material disposal facilities, these sediments contain significant levels of contaminants and these contaminants will have a significant impact on the aquatic environment both in the area of the dredging activities and in the areas surrounding the disposal facilities. Therefore, the Corps has incorrectly concluded the contaminants found in the dredged material will not have any impact on the natural environment.

C. The DSEIS Does Not Adequately Address the Net Loss of Wetlands That Will Occur as a Result of the Four Proposed Upland Disposal Facilities.

1. There Will Be a Net Loss of Wetlands in New Jersey From the Proposed Project.

The Corps proposes to build four upland disposal facilities in southern New Jersey which it acknowledges will result in the destruction of 396 acres of existing wetlands currently present at these sites. In the DSEIS, the Corps recognizes that portions of these sites provide an exceptionally valuable habitat for wildlife. The Corps, however, does not propose any permanent replacement of wetlands to mitigate for the loss of 396 acres of wetlands in New Jersey.<sup>3</sup>

<sup>3</sup> The Project does include a proposed "wetland restoration project" at Egg Island Point, New Jersey, a site at which the Corps proposes to place geotextile tubes filled with dredged material to protect the shoreline and create conditions in which wetlands may form. According to the United States Fish and Wildlife Service's Planning Aid Report dated August 1995, the

Although the Corps has proposed to create wetlands mitigation banks on the fringes of the four sites, these wetlands mitigation banks are not intended to mitigate for the Project's adverse impacts to the existing wetlands. Instead, the Corps has proposed that these wetlands mitigation banks be created to generate revenue for the local sponsor of the Project. The creation of these banks will generate "credits" which will be sold by the local sponsor to mitigate for the destruction of other wetlands filled by construction projects unrelated to the Project. Therefore, the wetlands mitigation banks cannot be counted as mitigation for the adverse wetlands impacts created by the Project.

Presently, the only wetlands replacement project proposed by the Corps in New Jersey is the creation of temporary shallow water wetlands on top of the dredged material disposal facilities. The Corps has proposed creating subcompartments in each of the four dredged material disposal areas. The Corps intends to rotate its use of the subcompartments and intends to allow temporary ponds to form on top of each subcompartment while it is not in use. Although the Corps believes that these temporary ponds will result in a net increase of wetlands, these temporary ponds will be periodically destroyed every several years over the life-span of the disposal sites by the repeated

proposed wetland restoration project "may adversely impact oyster beds through increased turbidity and sedimentation." There is no correspondence in the DSEIS from the United States Fish and Wildlife Service indicating acceptance and approval of Egg Island Point project.

dumping of additional dredged material. In addition, these ponds are not a permanent mitigation measure because, presumably, at some point in time, each disposal site will be full of dredged material and will dry. Accordingly, the Corps has not adequately addressed the impact that the loss of this wetlands habitat will have on the wetlands resources in New Jersey.

**2. Acquisition and Use of Site 17G as a Dredged Material Disposal Site Would Reduce Wetlands Restoration in Southern New Jersey.**

A privately owned wetlands mitigation bank is currently restoring 200 acres of wetlands for a mitigation bank within the proposed dredged material disposal site the Corps identified as Site 17G. The areas adjacent to and on the perimeter of Site 17G have been recognized by the United States Fish and Wildlife Service as exceptional value areas and include tidal marshes along the Woodbury Creek. Several endangered species, including the bald eagle and the peregrine falcon, utilize these areas for nesting and feeding. In addition, several species listed on NJDEP's protected list, including the osprey, the great blue heron, and the american bittern, nest and feed extensively in the areas in and adjacent to Site 17G.

The Corps apparently intends to displace the private wetlands mitigation bank's efforts to create a privately-owned wetlands mitigation bank and replace it with a dredged material disposal facility of approximately 300 acres in size. The Corps' proposed use of Site 17G would not only displace the currently approved, privately operated 200 acre wetlands mitigation bank,

but it would also preclude the planned restoration and creation of additional acres of wetlands along the Woodbury Creek and other nearby tributaries of the Delaware River. In the DSEIS, the Corps does not consider the significant impact that the siting of an upland disposal facility at Site 17G would have on wetlands restoration efforts in New Jersey.

**D. The DSEIS Does Not Address the Impact That Disposal of Out-of-Region Dredged Material at the Four Proposed Upland Disposal Facilities Will Have on the Environment.**

To finance the \$100 million local share of the Deepening Project, the Corps has proposed that the Delaware River Port Authority ("DRPA") acquire and operate the four proposed upland disposal facilities. The disposal capacity for each of the four sites is designed to accommodate dredged material in excess of the material generated by the deepening of the Delaware River. This excess capacity can be used for disposal of dredged materials from private users or from out of the region. The Corps has prepared a Business Plan for the Non-Federal Sponsor Cost of the Delaware River Main Channel Deepening Project (the "Business Plan") which sets forth its proposal that DRPA issue a bond backed, in part, by revenues generated from tipping fees (the fees charged to private or out-of-region users who are allowed to dump at the site) to purportedly raise a portion of the funds necessary to both operate the upland disposal sites and fund a portion of the local share of the Project. The balance of the revenue to back the bond would come from the DRPA entering

the wetlands mitigation banking business on certain of these sites.

As a significant source of revenue, the Business Plan relies on the annual disposal of 500,000 cubic yards of material dredged from areas other than the Delaware and Schuylkill Rivers.<sup>4</sup> This represents more than half of the material that the Business Plan estimates will be disposed of annually at the proposed dredged material disposal sites. The Business Plan contemplates that some of this material will come from the Ports of New York and New Jersey.

Recent sampling performed by the New York District of the Corps indicates that at least two thirds of the sediment for

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<sup>4</sup> The first indication in the Business Plan that DRPA had to rely on the annual disposal of 500,000 cubic yards of material dredged from areas outside the region is found in a December 22, 1995 letter to the Corps from its consultant, The Greeley-Polhemus Group. (The December 25, 1995 letter is attached hereto as Exhibit "F.") In this letter, the consultant notes that the then current draft of the Business Plan supported a bond issue of \$38 million, with a shortfall of over \$70 million. The methods described in the letter "for fixing some of the problem" were identified as follows:

We discovered that, by doubling DRPA's capacity, increasing inflows by 500,000 cubic yards/year, and raising fees by a factor of five, we can easily close the gap. Obviously, there are many possible permutations that can satisfy the objective. We can discuss these further after you have read the report.

Thereafter, future versions of the draft Business Plan contained an unsubstantiated assumption that DRPA could generate revenues from the disposal of 500,000 cubic yards of dredged material generated outside the region, including from the Ports of New York and New Jersey.



the Ports of New York and New Jersey are Category III sediments. See September 1996 Dredged Material Management Plan for the Port of New York and New Jersey prepared by the New York District of the Corps at 1-2, to 1-3 (hereinafter referred to as "Dredged Material Management Plan"). Category III sediments are not suitable for ocean disposal because they contain significant levels of contaminants. The contaminants found in Category III sediments from the Ports of New York and New Jersey include, among other things, dioxins, heavy metals (including cadmium, mercury, and lead), PCBs, pesticides and polynuclear aromatic hydrocarbons. Category I and II sediments contain much lower concentrations of these contaminants and are suitable for ocean disposal. Therefore, it would not be cost-effective for the Ports of New York and New Jersey to dispose of these cleaner sediments at the proposed dredged material disposal sites associated with the Project because of the high transportation costs associated with moving the large volume of dredged material. More likely, the Ports of New York and New Jersey would use the proposed dredged material disposal sites associated with the Project for the disposal of highly contaminated Category III sediments.

In the Dredged Material Management Plan, the New York District of the Corps stated that Category III materials must be disposed of at a facility with a liner and a storm water collection and treatment facility to ensure that surface water and ground water were not impacted by contaminants. Dredged

Material Management Plan at 5-1. Neither the Business Plan, nor the DSEIS, makes any provision for the construction of a lined dredged material disposal facility or for storm water management at any of the four proposed dredged material disposal facilities.

Although the DSEIS prepared by the Corps concludes that the disposal of dredged material at the DRPA sites will not significantly impact the environment, the DSEIS is premised on the assumption that only dredged material from the Delaware River will be disposed of at these sites. The DSEIS does not consider the adverse environmental impacts that would result from the disposal of contaminated dredged material from the Ports of New York and New Jersey or from other out-of-state ports (e.g. Baltimore) which do not want to dispose of contaminated dredged material within their own state.

# **DELAWARE RIVER: 45' CHANNEL PROJECT**

**CRITIQUE OF U.S. ARMY  
CORPS OF ENGINEERS  
PROJECT FEASIBILITY REPORT  
AND BENEFIT TO COST RATIO**

**PREPARED BY MARITRANS INC.  
MARCH 1996**

## **INTRODUCTION**

### **MARITRANS INC.**

- MARITRANS IS A PHILADELPHIA-BASED MARITIME COMPANY TRANSPORTING PETROLEUM BY BARGE. IT WAS INCORPORATED IN 1928 AND EMPLOYS APPROXIMATELY 500.
- MARITRANS OWNS/OPERATES TUGS/BARGES WHICH CARRY PETROLEUM IN PHILADELPHIA HARBOR, DELAWARE RIVER AND BAY, AND ALONG THE U.S. ATLANTIC AND GULF COASTS.
- MARITRANS SERVES DELAWARE VALLEY (PHILADELPHIA AREA) REFINERIES AND KNOWS THE DYNAMICS OF THE DELAWARE VALLEY REFINING INDUSTRY.
- MARITRANS' BARGES LIGHTER, I.E. PARTIALLY UNLOAD, CRUDE OIL TANKERS AT MOUTH OF DELAWARE BAY WHICH THEN PROCEED TO DELAWARE VALLEY REFINERIES AND OFFLOAD.
- MARITRANS IS A MEMBER OF PORT COMMUNITY AND WANTS PORT OF PHILADELPHIA TO SUCCEED.
- MARITRANS HAS ANALYZED ARMY CORPS OF ENGINEERS' ("COE") ECONOMIC BENEFITS OF 45' CHANNEL PROJECT AND CONCLUDED THAT THE GROWTH IN CRUDE OIL IMPORTS HAS NOT

REFINERIES WOULD BENEFIT FROM THE PROJECT,  
WHICH TOGETHER WITH MINIMAL NON-PETROLEUM  
BENEFITS DO NOT JUSTIFY THE \$329 MILLION  
PROJECT COST.

MARITRANS INC.  
CRITIQUE OF  
U.S. ARMY CORPS OF ENGINEERS  
BENEFIT/COST RATIO

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I. COE'S PROJECT COST DATA

\*TOTAL COST PER 1992 COE \$278,293,000  
FEASIBILITY REPORT

\*TOTAL COST IN 1992 WHEN COE  
SUBMITTED ITS REPORT TO 102ND \$294,931,000  
CONGRESS

\*CURRENT TOTAL COST (ASSUMING  
ORDINARY INFLATION):

FEDERAL SHARE	\$218,773,000
NON-FEDERAL SHARE	<u>\$110,818,000</u>
TOTAL COST	\$329,591,000

COE ANNUALIZED PROJECT COST  
(UNINFLATED-BASED ON  
\$278,000,000): \$32,113,000

PAYMENT OF NON-FEDERAL SHARE  
(CONGRESSIONAL INTENT)

HOUSE PUBLIC WORKS COMMITTEE STATED:

"The Committee believes that the non-federal  
cost of the Channel should be funded by water  
transportation users, not surface  
transportation users."

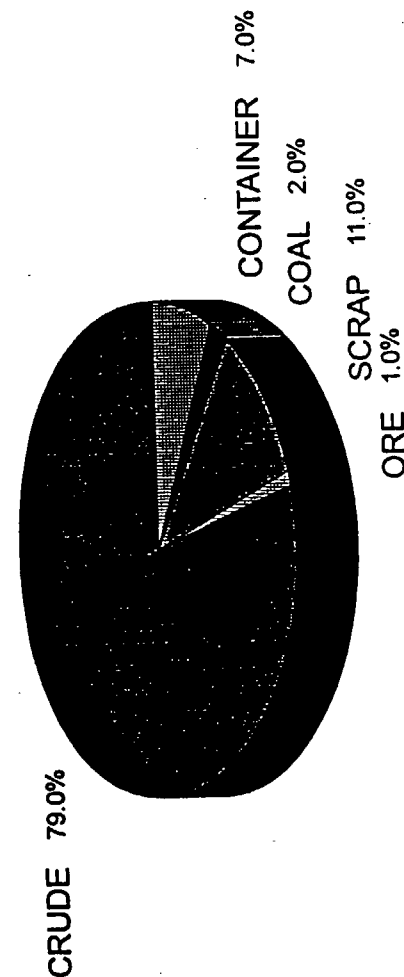
SINCE COE PROJECTS 79% OF BENEFITS ACCRUE TO  
DELAWARE VALLEY REFINERS, THIS SUGGESTS THAT  
THEY SHOULD BEAR 79% OF \$110 MILLION NON-  
FEDERAL COST. MARITRANS' ANALYSIS SHOWS THAT  
BENEFITS TO REFINERIES DO NOT JUSTIFY SUCH  
PAYMENT BY THE REFINERIES OR ANYONE ELSE OR  
THE \$218 MILLION FEDERAL COST.

## II. COE'S ANALYSIS OF PROJECT BENEFICIARIES

OIL REFINERIES (79%)	
VESSELS > 40 FEET DRAFT	\$25,430,000
VESSELS < 40 FEET DRAFT	8,390,000
COAL (1%)	311,000
IRON ORE (IMPORTS) (1%)	475,000
SOUTH JERSEY PORT CORP. (12%)	
SCRAP	4,917,000
COAL	160,000
CONTAINERS (7%)	<u>2,895,000</u>
TOTAL ANNUAL BENEFITS	\$42,578,000
TOTAL ANNUAL COSTS	\$32,113,000
COE BENEFIT/COST RATIO	1.34

COE'S BENEFIT COST ANALYSIS CONTAINED IN ITS 1992 FEASIBILITY REPORT IS THE BASIS ON WHICH CONGRESS AUTHORIZED PROJECT.

## SHARE OF COE PROJECT BENEFICIARIES



III. ERRORS IN COE'S BENEFIT/COST ANALYSIS:  
MARITRANS HAS UNCOVERED A NUMBER OF ERRORS  
IN COE'S BENEFIT/COST ANALYSIS WHICH  
REDUCES THE BENEFIT/COST RATIO TO  
MATERIALLY LESS THAN 1.0, THUS RENDERING  
THE PROJECT ECONOMICALLY UNSOUND.

ERROR #1

GROWTH OF CRUDE OIL IMPORTED INTO COE'S CLAIMED-  
BENEFITTING DELAWARE VALLEY REFINERIES IS GROSSLY  
OVERSTATED:

- COE'S JUSTIFICATION FOR ENTIRE PROJECT BASED  
ON SUBSTANTIAL PROJECTED INCREASE IN CRUDE  
IMPORTS, WHICH WOULD MEAN INCREASED LIGHTERING  
(COSTS OF WHICH THE 45' CHANNEL WOULD  
PRESUMABLY REDUCE).
- IN COE'S 1992 REPORT, COE'S CONSULTANT  
PROJECTED FRONT-END LOADED ANNUAL CRUDE OIL  
IMPORT GROWTH AS FOLLOWS:

1989 - 1995	3.9%/YEAR
1996 - 2000	2.7%/YEAR
2001 - 2005	1.428%/YEAR
2006 - 2015	1.383%/YEAR
2016 - 2030	0.638%/YEAR
2030 - 2055	- 0.398%/YEAR

- ACTUAL IMPORT VOLUME GROWTH (1987 THRU JULY  
1995) WAS .76%/YEAR.

SOURCE: AMERICAN PETROLEUM INSTITUTE DATA

- PIRA ENERGY GROUP STATES THAT FOR THE  
PERIOD 1995-2000, REFINERY RUNS FOR  
DELAWARE VALLEY REFINERIES WHICH RELY ON  
FOREIGN CRUDE ARE "LIKELY TO BE FLAT."

SOURCE: PIRA ENERGY GROUP

ALL WERE SOLD AT A PRICE EQUAL TO 5-15% OF THEIR REPLACEMENT COST. THE BRITISH PETROLEUM PHYSICAL PLANT JUST SOLD FOR \$75 MILLION. ITS REPLACEMENT COST WOULD BE APPROXIMATELY \$1.5 BILLION.

- IF REFINING IN THE DELAWARE VALLEY IS A GROWTH INDUSTRY, MAJOR OIL COMPANIES WOULD NOT HAVE VIRTUALLY GIVEN AWAY THESE THREE REFINERIES!
- THE RECENT PURCHASER OF ONE OF THESE REFINERIES HAS CLOSED IT, HARDLY AN INDICATION OF FUTURE GROWTH IN CRUDE OIL IMPORTS.
- BASED ON FOREGOING, PROPER ESCALATOR FOR IMPORT VOLUMES AFTER 1995 IS .8% ANNUALLY. IT IS SLIGHTLY MORE THAN WITH 1987 THRU 1995 ACTUAL FIGURE, AND IS SAME AS ACTUAL ANNUAL REFINERY CAPACITY INCREASE.<sup>2</sup>

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<sup>2</sup> THE ACTUAL FUTURE GROWTH RATE OF CRUDE OIL INTO THE DELAWARE VALLEY REFINERIES COULD BE LOWER THAN .8% ANNUALLY, BECAUSE THE CLOSED REFINERY REFERRED TO ABOVE REPRESENTED 16.5% OF DELAWARE VALLEY REFINING CAPACITY.

\*COE INCORRECTLY ASSUMED INCREASE OF CRUDE IMPORTS INTO U.S. WOULD APPLY TO DELAWARE VALLEY REFINERIES.

- IN MAY 1995 LETTER, DEFENDING 1992 PROJECTIONS, COE STATES CRUDE IMPORTS INTO U.S. HAVE INCREASED 3.2% ANNUALLY.
- WHILE CRUDE IMPORTS INTO U.S. HAVE INCREASED BY ABOUT 3.2%/YEAR, MOST HAS MERELY REPLACED DOMESTIC CRUDE AS SOURCE OF REFINERY RUNS.
- DELAWARE VALLEY REFINERIES ALREADY RUN ON 100% FOREIGN CRUDE, SO ONLY PROJECTED GROWTH (.8%/YEAR) COMES FROM INCREASE IN CONSUMPTION, WHICH IS EXPECTED TO BE MODEST.
- OTHER FACTORS LIMITING CRUDE OIL IMPORTS INTO DELAWARE VALLEY REFINERIES<sup>3</sup>:
  - COMPETITION FROM IMPORTED REFINED PRODUCTS.
  - REFINERIES HAVE LIMITED STORAGE CAPACITY.

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<sup>3</sup>Projected growth of .8%/year does not take into account the closure of one major Delaware Valley refinery (See p.10).



COE'S PROJECT BENEFITS CORRECTION #1

ORIGINAL COE BENEFIT/COST RATIO (PAGE 3)  
CORRECTED TO REFLECT ACTUAL CRUDE OIL IMPORT RATE  
IN 1995 AND .8% ANNUAL ESCALATOR OF CRUDE IMPORTS  
THROUGH LIFE OF PROJECT (SEE PAGES 5-11).

REFINERIES

VESSELS > 40 FEET DRAFT \$17,727,000

VESSELS < 40 FEET DRAFT 6,020,000

COAL 311,000

IRON ORE 475,000

SOUTH JERSEY PORT CORP.

SCRAP 4,917,000

COAL 160,000

CONTAINERS 2,895,000

TOTAL BENEFITS \$32,505,000

TOTAL COSTS \$32,113,000

BENEFIT/COST RATIO (corrected) 1.01

THE EXTENT OF THE COE'S CONSULTANT'S ERROR IN PROJECTING CRUDE OIL IMPORTS TO COE-CLAIMED BENEFICIARY REFINERIES IS SHOWN IN THE FOLLOWING TABLE:

COE BENEFICIARY REFINERY CRUDE VOLUMES  
(MILLIONS SHORT TONS/YEAR)

YEAR	COE PROJECTION	ACTUAL*	PROJECTION ERROR
1987	-	35.7	-
1988	-	35.7	-
1989	37.5	36.1	1.4
1990	39.0	38.0	1.0
1991	40.5	36.9	3.6
1992	42.0	36.7	5.3
1993	43.7	39.5	4.2
1994	45.4	37.2	8.2
1995 (7 mos.)	47.1	38.0 (projected)	9.1

\*SOURCE: AMERICAN PETROLEUM INSTITUTE

THE PROPER VOLUME FOR BASING FUTURE PROJECTIONS IS 1995 PROJECTED ACTUAL OF 38.0 MILLION S.T./YR.

## ERROR #2

COE USED LIGHTERING RATE OF 40¢/BARREL IN COMPUTING LIGHTERING BENEFITS FROM PROJECT, WHEREAS ACTUAL RATE IS LESS THAN THAT NUMBER.

- DUE TO SYSTEM IMPROVEMENTS AND REFINERY CONSOLIDATION/ECONOMIES, MARITRANS' LIGHTERING RATE TO REFINERIES IS NOW LESS THAN THAT NUMBER, NOT 40¢/BARREL USED BY COE IN 1992 REPORT.
- ACTUAL LIGHTERING COSTS, I.E. MARITRANS RATES DURING MORE RECENT PERIOD NOT REFLECTED IN LIGHTERING COST DATA USED BY COE SHOW THAT IN EACH OF THE YEARS 1992, 1993 AND 1994, THE ACTUAL PER BARREL COST WAS LESS THAN 40¢/BARREL.
- PROPER FIGURE FOR COMPUTING LIGHTERING COSTS IS NOT 40¢/BARREL, BUT A NUMBER LESS THAN THAT REPRESENTING THE ACTUAL WEIGHTED AVERAGE FOR THE PERIOD 1992-1994.

### ERROR #3

THE COE'S BASE CASE ASSUMPTION OF THE PERCENTAGE OF CRUDE OIL LIGHTERED IS TOO HIGH.

- THE COE USED A BASE CASE ASSUMPTION OF 31% AS THE PERCENTAGE OF CRUDE OIL LIGHTERED.
- THE ACTUAL PERCENT LIGHTERED WAS:

1992	31.4%
1993	29.1%
1994	28.9%

SOURCE: MARITRANS' LIGHTERING RECORDS

- THE PROPER FIGURE FOR PERCENT OF CRUDE OIL LIGHTERED IS 29%.

### COE PROJECT BENEFITS - CORRECTION #2

CORRECTED TO REFLECT PROPER GROWTH IN VOLUME OF IMPORTED CRUDE OIL (SEE PAGES 5 - 11) AND CORRECTED FOR PER BBL. LIGHTERING COSTS (SEE PAGE 13) AND PERCENTAGE LIGHTERED (SEE PAGE 14).

#### REFINERIES

VESSELS > 40 FEET DRAFT	\$15,059,000
VESSELS < 40 FEET DRAFT	6,020,000

COAL	311,000
------	---------

IRON ORE	475,000
----------	---------

#### SOUTH JERSEY PORT CORP.

SCRAP	4,917,000
COAL	160,000

CONTAINERS	<u>2,895,000</u>
------------	------------------

TOTAL BENEFITS	\$29,837,000
----------------	--------------

TOTAL COSTS	\$32,113,000
-------------	--------------

BENEFIT/COST RATIO <sub>(corrected)</sub>	0.93
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#### ERROR #4

COE OVERSTATES THE NUMBER OF BENEFITING REFINERIES AND THUS OVERSTATES VERY SIGNIFICANTLY THE LIGHTERING BENEFITS OF THE PROJECT TO THE DELAWARE VALLEY REFINERIES.

##### A. NUMBER OF BENEFITTING REFINERIES:

- IN 1992 REPORT, COE STATED SIX REFINERIES WOULD BENEFIT.
- IN 1995 LETTER, COE ADMITTED FIVE REFINERIES WOULD BENEFIT.
- CHARLES ZEIN AND ASSOCIATES ("CZA") CONCLUDED IN 1993 THAT ONLY THREE, (POSSIBLY FOUR) REFINERIES WOULD BENEFIT.
- SINCE 1993, ONE CZA-IDENTIFIED REFINERY BENEFICIARY (SUN - FT. MIFFLIN) STOPPED LIGHTERING DUE TO SOURCE OF CRUDE OIL ( BUT RECENTLY RESTARTED), AND A SECOND (BP-MARCUS HOOK, NOW TOSCO) CONFIRMED IT CANNOT USE PROJECT BECAUSE OF HIGH HOOK-UP COSTS.
- TOSCO HAS CLOSED THE FORMER BP REFINERY.
- THEREFORE, ONLY THREE REFINERIES WOULD BENEFIT FROM 45' CHANNEL (COASTAL-EAGLE POINT, SUN - FT MIFFLIN, AND SUN-HOG ISLAND) NOT SIX AS STATED BY COE.

##### B. LIGHTERING BENEFITS

- COE RECENTLY STATED "LIGHTERING REQUIREMENTS WOULD BE REDUCED BY WEIGHTED AVERAGE OF 42%."
- IN 1992 REPORT, COE STATED LIGHTERING WOULD BE REDUCED BY 33%.
- MARITRANS HAD CZA ANALYZE ALL VESSELS ACTUALLY CALLING IN 1992 ON REFINERIES WHICH COE HAS IDENTIFIED AS PROJECT BENEFICIARIES. CZA COMPUTED ACTUAL NUMBER OF BARRELS LIGHTERED WHICH WOULD BE AVOIDED WITH 45' CHANNEL.
- CZA CONCLUDED THAT SAME NUMBER OF VESSELS WOULD ARRIVE REGARDLESS OF CHANNEL DEPTH. VESSEL SIZE NOT DETERMINED BY RIVER CHANNEL DEPTH, BUT BY DEPTH AT BIG STONE BEACH ANCHORAGE (WHERE VESSELS ARE LIGHTERED), AND OTHER FACTORS SUCH AS CRUDE LOT SIZE AND FOREIGN PORT DEPTHS.
- COE GROSSLY UNDERSTATES HOOK-UP COSTS:
  - > SUN AND TOSCO'S HOOK-UP COSTS (E.G., PRIVATE CHANNELS/DOCKS, ETC.) ARE ESTIMATED \$73 MILLION, FAR MORE THAN \$23 MILLION PROJECTED FOR ALL PROJECT BENEFICIARIES BY COE IN 1992 REPORT.
  - > MARITRANS BELIEVES THE COE HAS IGNORED ASSOCIATED COSTS FOR NON-PETROLEUM USES SUCH AS GIANT CRANES AND HUGE MARSHALLING AREAS NEEDED FOR SUPER CONTAINER SHIPS.

- BASED ON CZA'S STUDY AND SUBSTANTIAL HOOK-UP COSTS, AND TOSCO REFINERY CLOSING MARITRANS CONCLUDES THAT LIGHTERING WOULD BE REDUCED BY ONLY 20%<sup>4</sup>.

### COE'S PROJECT BENEFITS CORRECTION #3

CORRECTED TO REFLECT PROPER GROWTH IN VOLUME OF IMPORTED CRUDE OIL (SEE PAGES 5 - 11) AND CORRECTED FOR PER BARREL LIGHTERING COSTS AND PERCENTAGE LIGHTERED (SEE PAGES 13 - 14) AND CORRECT NUMBER OF BENEFITTING REFINERIES (SEE PAGES 16-18).

#### REFINERIES

VESSELS > 40 FEET DRAFT	\$10,539,000
VESSELS < 40 FEET DRAFT	2,444,000
COAL (EXPORT)	311,000
IRON ORE	475,000
SOUTH JERSEY PORT CORP.	
SCRAP	4,917,000
COAL	160,000
CONTAINERS	<u>2,895,000</u>
TOTAL BENEFITS	21,741,000
TOTAL COSTS	32,113,000
BENEFIT/COST RATIO (corrected)	0.67

---

<sup>4</sup>Maritrans maintains that in the event TOSCO refinery reopens, it will not benefit from project because of high hook-up costs.

WHILE COE APPARENTLY DID NOT INCLUDE THE CONCEPT IN THEIR BENEFIT/COST RATIO, COE HAS INCORRECTLY STATED THAT USE OF DOUBLE-HULLED TANKERS AFTER 2000 WILL REQUIRE DEEPER CHANNEL.

- DOUBLE-HULL TANKERS ARE BEING BUILT TO CARRY SAME AMOUNT OF CARGO AS SINGLE-HULL TANKERS AT SAME OR LESS DRAFT. (OBVIOUSLY, WORLD'S NAVAL ARCHITECT'S UNDERSTAND NOT ALL WORLD'S PORTS CAN BE PERMANENTLY DEEPEMED FOR DOUBLE HULLS.)
- MARITRANS' ABOVE POSITION IS SUPPORTED BY COE'S CONSULTANT IN 1993 REPORT, CITING LLOYD'S SHIPPING LIST GREEN TANKER GUIDE.

#### ERROR #5

THE COE INCORRECTLY CALCULATED THAT DEEPENING THE CHANNEL WILL RESULT IN TIME "SAVINGS" TO THE REFINERIES FROM THE LIGHTERING SYSTEM OF \$1.7 MILLION ANNUALLY, WHEREAS THE PROJECT AS ENVISIONED BY THE COE WILL RESULT IN NO SUCH ACTUAL SAVINGS.

- THE COE'S METHODOLOGY MISTAKENLY ASSUMES THE SAME LIGHTERING SYSTEM WILL EXIST AFTER THE PROJECT AS BEFORE, PARTICULARLY THE NUMBER OF MARITRANS LIGHTERING VESSELS.
- SINCE LIGHTERING TO THE BENEFITTING REFINERIES WILL BE REDUCED 20% BY THE PROJECT (SEE P.18), MARITRANS WILL BE FORCED TO REDUCE ITS LIGHTERING FLEET BY 20%, OR ONE VESSEL UNIT.
- BECAUSE THERE WILL BE LESS LIGHTERING VESSELS IN THE LIGHTERING SYSTEM, THE COE'S "EFFICIENCY SAVINGS" WILL NOT MATERIALIZE, SO COE'S PROJECTED SAVINGS OF \$1.7 MILLION PER/ANNUM IS INCORRECT.

#### IV. NON-PETROLEUM ASPECTS OF PROJECT CONTAINERS

IN MAY 15, 1995, LETTER TO DELAWARE RIVER PORT AUTHORITY, COE STATED THAT: "THE CORPS' 1992 FEASIBILITY REPORT ANALYSIS CONCLUDED THAT THE CHANNEL DEEPENING WILL NOT INDUCE INCREASED TONNAGE INTO THE PORT (EMPHASIS SUPPLIED)."

- COE'S 1992 STUDY PROJECTS THAT CONTAINER TRAFFIC WILL RECEIVE ONLY 7% OF PROJECT BENEFITS. COE CONFIRMED IN ITS MAY 15, 1995 LETTER, THAT THE SOURCE OF THIS 7% NUMBER WAS DELAWARE RIVER PORT AUTHORITY.

BASED ON ITS ANALYSIS OF CONTAINER TRAFFIC DEVELOPMENTS, CZA PREDICTS THAT CONTAINER INTERESTS WILL NOT BENEFIT FROM PROJECT:

- MOST OF PRESENT CONTAINER LINES OPERATING IN DELAWARE RIVER ARE IN NORTH/SOUTH TRADE WHICH WILL CONTINUE TO USE <40' DRAFTS DUE TO NATURE OF TRADE, I.E. LIMITED DRAFTS OF SOUTHERN HEMISPHERE PORTS AND NEED TO TRANSIT PANAMA CANAL.
- NO MAJOR EAST/WEST OPERATOR WITH <40' DRAFT VESSELS NOW STOPS IN PHILADELPHIA. CHEAPER TO STOP IN NEW YORK AND DISTRIBUTE BY TRUCK TO PHILADELPHIA THAN STOP AT BOTH PORTS
- LARGER, DEEPER DRAFT CONTAINER SHIPS BEING BUILT FOR EAST/WEST TRADES (EUROPE TO U.S. E COAST), WILL BE LESS LIKELY THAN EVER TO STOP IN PHILADELPHIA. BIGGER SHIPS MUST STOP AT FEWER PORTS/SPEND MORE TIME AT SEA TO BE
- ECONOMICAL.

- NEW, LONGER EAST/WEST TRADE - S.E. ASIA TO U.S. EAST COAST VIRTUALLY CERTAIN TO BYPASS PHILADELPHIA FOR SAME REASONS.

#### SCRAP TRADE

- COE PROJECTS SOUTH JERSEY SCRAP TRADE WOULD RECEIVE 11% OF PROJECT BENEFITS BECAUSE TURKEY'S SCRAP PORTS CAN RECEIVE VESSELS WITH UP TO 72' DRAFTS.
- CZA CHECKED PORT DRAFTS IN SIX SCRAP-RECEIVING PORTS IN TURKEY AND 5 OTHER SCRAP-PROCESSING COUNTRIES AND FOUND ONLY ONE OF SIX PORTS IN TURKEY HAD DRAFT OF 65'.
- COE ASSIGNED ENTIRE SCRAP BENEFIT TO THAT ONE 65' PORT OUT OF ALL THE SCRAP PORTS IN THE WORLD.
- THE COE SCRAP BENEFIT FIGURE IS OBVIOUSLY OVERSTATED, BASED ON THE FOLLOWING DATA FOR 1995 FROM THE U.S. DEPARTMENT OF COMMERCE.

**SCRAP EXPORTS FROM  
PORT OF PHILADELPHIA  
(1/1/95 - 9/30/95)**

Source: U.S. Department of Commerce

DESTINATIONS	NO. SHIPMENTS OVER 3000 T.	TONNAGE
Turkey	3	68,267
Korea	6	209,845
India	2	43,457
Venezuela	1	43,591
Japan	2	21,124
TOTALS	14	386,284

- Shipments to Korea and Japan must traverse Panama Canal, so 45' Channel offers no benefit.
- Venezuela's and India's receiving ports are less than 40', so 45' Channel offers no benefit.
- Turkey, with less than 18% of scrap exports, has become a minor destination for scrap from Philadelphia.
- Turkey's one deep water receiving port, to which South Jersey Port Corp. and U.S. Army Corps of Engineers has ascribed all scrap exports, is irrelevant to 45' Channel Cost/Benefit analysis.

**COAL**

- IN MAY 15, 1995, LETTER TO DRPA, THE COE STATED: "COAL BENEFITS (CONRAIL), ANOTHER MINOR BENEFIT CATEGORY, ARE NO LONGER CLAIMABLE BECAUSE CONRAIL HAS MOVED ITS COAL OPERATIONS TO BALTIMORE."
- CZA ASSUMES THAT MINIMAL BENEFIT TO SJPC FROM COLOMBIAN COAL IMPORTS WILL CONTINUE.



# V. MARITRANS' PROJECTED ACTUAL BENEFICIARIES AND BENEFIT/COST RATIO

## REFINERIES

VESSELS > 40 FEET DRAFT	\$10,539,000
VESSELS < 40 FEET DRAFT	<u>2,449,000</u>

SUBTOTAL.....\$12,988,000

## NON-PETROLEUM

COAL	0
------	---

IRON ORE	475,000
----------	---------

SOUTH JERSY PORT CORP.

SCRAP	141,610
-------	---------

COAL	160,000
------	---------

CONTAINERS	<u>0</u>
------------	----------

SUBTOTAL.....\$ 766,610

TOTAL BENEFITS	\$13,764,610
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TOTAL COSTS	\$32,113,000
-------------	--------------

BENEFIT/COST RATIO (corrected)	0.43
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# VI. RECENT DEVELOPMENTS

- THE METRO MACHINE PROPOSAL FOR USING THE FORMER PHILADELPHIA NAVAL SHIPYARD WOULD NOT BENEFIT FROM A DEEPER RIVER CHANNEL, NOR WOULD IT BE AFFECTED BY THE CURRENT 40' CHANNEL.
- FAST SHIPS, A NEW OCEAN TRANSPORT CONCEPT, HAS DESIGN DRAFT OF 35', AND THUS CAN USE THE EXISTING 40' CHANNEL.
- AMERIPORT DOES NOT DEPEND ON A 45' CHANNEL.

## VII. OVERALL CONCLUSIONS

- THE GROWTH IN IMPORTED CRUDE OIL TO JUSTIFY THIS \$329 MILLION PROJECT HAS NOT MATERIALIZED, AND WILL NOT MATERIALIZE IN THE FUTURE.
- THE MINIMAL PROJECT BENEFITS TO THE DELAWARE VALLEY REFINING INDUSTRY WOULD ACCRUE TO ONLY THREE OIL REFINERIES, NOT SIX.
- NON-PETROLEUM BENEFITS (ASSUMED BY COE TO BE ONLY 21%) ARE MUCH LESS THAN PROJECTED, AND IN ANY EVENT ARE INSUFFICIENT TO MAKE THE PROJECT ECONOMICALLY SOUND, I.E., BENEFIT COST RATIO IN EXCESS OF 1.0.
- RATIO OF COMBINED PETROLEUM AND NON-PETROLEUM BENEFITS TO COSTS OF THE 45' CHANNEL PROJECT IS .43, WELL BELOW 1.0, AND THUS INSUFFICIENT TO MAKE PROJECT ECONOMICALLY SOUND.
- THE EXPENDITURE OF APPROXIMATELY \$329 MILLION IN FEDERAL AND NON-FEDERAL FUNDS COULD BE BETTER USED TO CREATE ADDITIONAL PERMANENT JOBS AND OTHER ECONOMIC BENEFITS IN CONNECTION WITH OTHER PORT OR AREA PROJECTS.

DACW72-94-D-0002  
Subcontract to DRI/McGraw Hill  
Task Order 0006

Prepared for the  
U.S. Army Corps of Engineers  
Philadelphia, Pennsylvania

*Draft:*

### DRPA ORGANIZATION, FINANCIAL CAPACITY AND FINANCING OPTIONS FOR LOCAL SPONSOR COST-SHARING AND LOCAL IMPACTS OF THE DELAWARE RIVER MAIN CHANNEL DEEPENING PROJECT

December 28, 1995



The Greeley-Polhemus Group, Inc.

105 South High Street  
West Chester, Pennsylvania 19382-3226  
(610) 692-2224

*Draft:*  
**DRPA Organization, Financial Capacity and Financing Options  
for Local Sponsor Cost-Sharing and Local Impacts of the  
Delaware River Main Channel Deepening Project**

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**5.3.2 Operations**

Once it is constructed, the improved navigation channel will benefit local businesses through transportation cost savings. Deeper draft vessels, which can hold more cargo, will now be able to navigate the 45-foot channel. The increased efficiency of transporting commodities (by allowing more fully laden ships to transit the waterway and by reducing costly light-loading procedures in the Delaware Bay reach of the channel) will result in annual cost savings estimated by the Corps of Engineers of \$40.1 million (1995 price levels).

The analysis assumes that there will be no change in the volumes of transported cargoes under without and with project conditions (the basis of the Corps' Project Feasibility Analysis). Another assumption involves who will be affected by the cost savings that result from the reduction in lightering. One effect of reduced lightering would be a reduction in the demand for lightering services. If the present practice is that the recipients of lightered cargoes pay the full costs of the lightering, then a reduction in lightering is a reduction in costs for the firms whose cargoes are lightered less. Thus, in one view, the savings, which are really the avoided costs of lightering, are just a transfer of income from the lightering firms (barges and tugs) to the firms paying for the transportation of the cargoes. In this view there would probably be a small negative effect on the economy of the region because the lightering firms spend more of their receipts in the region than do the firms whose cargoes are lightered. In another view, and one which is adopted for this analysis, the lightering firms' incomes will not be affected because they will adjust their prices on the balance of their services to restore their incomes to the levels prevailing before the reduction in lightering. The savings in transportation costs will affect the firms that no longer have to pay for lightering or shipping their cargoes, such as oil refineries and containerized shipping companies.

In order for these transportation savings to have any effect in the regional economy, some assumptions have to be made regarding what is done with them. One possibility could be that 100 percent of the savings would be passed on in wages and salaries to the employees of the firms with the reduced costs. This would

be an unlikely occurrence, however, because the managers of these firms would be motivated to do other things with the savings. They might pass some of the cost savings on to the firms' owners/shareholders (perhaps as increased dividends), many of whom live outside of the region. It is also possible that the cost savings would result in some additional capital expenditures which undoubtedly would have components that would have to be purchased from outside of the region. There are no data which one can use to predict with precision how any specific firm will treat cost savings. Based on experience in dealing with firms' and households' expenditures in the region over many years, and based on some plausible reasoning regarding the locations of the owners of firms, the location of capital equipment producers, and other factors, our analysis has assumed that 50 percent of the cost savings (or \$20.1 million)<sup>52</sup> would find its way into increased household expenditures in the region. This would come from increased incomes in the form of higher firm proprietor earnings, shareholder dividends, and employee wages at firms experiencing the savings.

#### 5.4 Economic Impacts (Outputs)

##### 5.4.1 Construction

Table 5-2 summarizes the direct and indirect effects over the four-year construction phase of the deepening project on industries in the three-state region in terms of employment, total wages paid, and the total value of output produced (total sales). Input-output tables, one for the Federal share of the construction costs (\$199 million) and one for the non-Federal share of the construction costs (\$97.8 million) describe the effects in the State of New Jersey (where the dredging firm and disposal sites are located). These tables are in Appendix C.

The channel deepening project will have a significant annual impact on the area economy during the four-year construction phase. Direct and indirect employment totals 1,475 jobs, wages are more than \$53 million and output is valued at approximately \$105 million. Multipliers (the ratio of total direct and indirect

<sup>52</sup> Other, alternative ways were proposed for calculating transportation cost savings (such as \$08 per barrel of oil shipped through the Delaware Main Channel) but the question remains concerning how much or what percentage of the savings will impact the regional economy.

COMPARISON OF NJDEP'S RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA  
WITH THE MAXIMUM CONTAMINANT LEVELS DETECTED  
IN EACH OF THE REACHES OF THE DELAWARE RIVER

Contaminant	NJDEP Residential Direct Contact Soil Cleanup Criteria	Maximum Concentration Detected in Reach A	Maximum Concentration Detected in Reach B	Maximum Concentration Detected in Reach C	Maximum Concentration Detected in Reach D	Maximum Concentration Detected in Reach E
Antimony	14	24	32	32.4	35	ND
Arsenic	20	26.6	18.4	52.8	17.5	6.5
Beryllium	1	0.82	1.5	1.5	1.5	0.84
Cadmium	1	5.24	4.0	4.8	5.2	2.8
Lead	100	146	120	173	102	25.2
Selenium	63	155	119	136	117	121
Thallium	2	0.19	9	0.32	10.5	ND
PCBs	0.49	ND	1.19	ND	0.19	ND
Benzo(a)pyrene	0.66	ND	1.12	0.49	0.37	ND
Benzo(k)fluoranthene	0.9	0.67	1.02	0.82	0.08	ND
Benzo(a)anthracene	0.9	ND	1.52	ND	0.11	ND

\* The soil cleanup criteria and sampling results are given in ppm. The sampling results are obtained from Tables 4-2 through 4-6 in the DSLIS.



# SITE REMEDIATION NEWS

April 1994

Volume 06 Number 1

## Future Land Use: A Key Consideration In Remedy Selection

By: Lance R. Miller, Site Remediation Program

Future land use is one of the most important criteria that must be considered when establishing the remediation standard and remedy to be implemented at a contaminated site. However, future land use is most effectively considered after two broader policy decisions are rendered. These policy decisions are defining "how clean is clean?" and determining how, or whether, to implement a preference for permanent remedies. These two policy issues establish the framework for making site specific decisions.

The answer to the question "how clean is clean?" is based on the level of risk which will, as a matter of policy, be appropriate at a site after remediation is completed. Once this risk reduction goal is established, different land use considerations may be incorporated into the development of remediation standards through consideration of exposure scenarios. Different land uses result in different human exposure pathways as well as different exposure durations, thus varying remediation standards that may be appropriate based upon land use.

The decision to establish a preference for permanent remedies and the degree to which the preference will be enforced is also of critical importance since it will define the scope of remedies to be considered at a contaminated site. The policy issues that need to be considered in evaluating such a preference include the technical perfor-

mance of the remedy and determining how much additional cost society is willing to pay for permanent remedies versus equally protective non-permanent remedies.

Only after consideration of these policy issues is it possible to turn to site specific considerations for establishing remediation standards. Determining what the future land use will be at the site is of critical importance. It is also a decision that the person remediating the site, be that the responsible party, developer, prospective landowner or government, cannot make alone.

The community in which the contaminated site is located must be involved in this decision, and, in order to be effective, involvement must occur early in the process. This will allow the investigatory work and the evaluation of alternatives to be based on the future land use scenarios for the particular site. To do otherwise risks the possibility that the investigatory and evaluation processes may have to be redone if the community's plans for the site have not been addressed.

When government is conducting a publicly funded remediation it must work with the community to determine their plans for the property after remediation. In these situations it is likely that the property will be the major asset to offset the public funds which were expended. Therefore, future land use decisions are important to the agency conducting the remediation as well as the community itself.

If both the state or federal government and the local community can agree on the future land use, then, generally, remediation will proceed undaunted. However, in situations where there is disagreement, negotiations are required. If a compromise is not reached through negotiations, the final decision must rest with the governmental agency that is paying for the cleanup. Of course any remedy selected by that agency must be protective of human health and the environment. However, the agency must also determine how much money it is willing to pay for the remediation of an individual contaminated site.

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(TCPA) information, marinas, schools, waste storage sites, docking facilities, airports, navigational aids, hospitals, clean-up strategies, location of boom, booming strategies, types of boom, who to contact, how much boom is necessary, who deploys it, what the currents are, who owns the property, and how to access the area. Eventually, the model will even be able to predict the movement of oil over water.

It is anticipated that by spring of 1994, an expanded, improved prototype of the plan will be computerized and operational. Future plans include mapping the entire river shoreline and the outer coastal areas, and developing a working model for use not only in the case of an oil spill, but also for use in planning, bird migration, and coastal mapping.

## Revisions to the Soil Cleanup Criteria

By: Barry Frasco, Hazardous Site Science Element

Soil Cleanup Criteria were first published in the April 1993 issue of the Site Remediation News (Volume 5, Number 1). Since this publication, there have been toxicity factor changes as well as the identification of computational and typographical errors for several contaminants. These changes and corrections have been incorporated into a revised Soil Cleanup Criteria list which is attached to the back of this newsletter.

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

Notwithstanding, where the criteria are based on human health impacts, the Department shall still consider environmental impacts when establishing site-specific cleanup levels. This, along with other site-specific factors, including background conditions, may result in site-specific cleanup levels which differ from the listed soil cleanup criteria. Therefore, the soil cleanup criteria shall not be assumed to represent approval by the Department of any remedial action or to represent the Department's opinion that a site requires remediation.

To obtain additional copies of the Soil Cleanup Criteria list, please contact your case manager or the Hazardous Site Science Element at (609) 633-6801.

## Use of Innovative Technologies For Remediation of ISRA Sites

By: Paul C. Kurisko, Bureau of Environmental Evaluation and Risk Assessment

P.L. 1993, c.139 (S-1070) was signed into law in June, 1993. This new law amended the Environmental Cleanup Responsibility Act (ECRA) and renamed it as the Industrial Site Recovery Act (ISRA). Since ECRA was passed in September of 1983, over 2000 cases have been issued Full Compliance Letters or Negative Declarations. Of these cases, however, only 11 have been remediated with the use of either Innovative or Alternative (I/A) technologies. This article will outline the status of the State's regulatory measures which affect the use of I/A technologies on ISRA sites; address the status of the use of I/A technologies in the New Jersey ISRA program, and show how the NJ ISRA program compares with the EPA Superfund program nationally.

DEPE has promulgated two major rules for the Site Remediation Program which effect ISRA cases and impact the use of I/A technologies for remediation. They are:

- Procedures for Department Oversight of the Remediation of Contaminated Sites, NJAC 7:26C
- Technical Requirements for Site Remediation, NJAC 7:26E

A third rule was proposed in February, 1992, but it has not yet been promulgated. This proposed rule was the Cleanup Standards for Contaminated Sites for soil. DEPE will work with the Environmental Risk Assessment and Risk Management Study Commission, established pursuant to P.L. 1993 c.139, to develop a new proposal for Cleanup Standards that will be consistent with the new ISRA legislation.

Although the Cleanup Standards will be the basis for the determination of site cleanup levels which I/A remediation technologies must meet, the Technical Requirements will play a major role in technology selection.

The use of I/A technologies for site remediation will be an important factor because permanent remedies are the first order of preference for remedy selection. Permanent remedies include the use of permanent treatment technologies, such as chemical or biological treatment to meet the determined site cleanup levels, or reuse of the contaminated material. The determination of an appropriate I/A

**Soil Cleanup Criteria (mg/kg)**  
(Last Revised — 2/3/84)

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

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

Contaminant	CASRN	Residential Direct Contact Soil Cleanup Criteria(a)(h)	Non Residential Direct Contact Soil Cleanup Criteria(a)(h)	Impact to Ground water Soil Cleanup Criteria(b)
Acenaphthene	83-32-9	3400	10000 (c)	100
Acetone	67-64-1	1000 (d)	1000 (d)	[50] 100 (i)
Acrylonitrile	107-13-1	1	5	[100] 1 (i)
Aldrin	309-00-2	0.040	0.17	50
Anthracene	120-12-7	10000 (c)	10000 (c)	[500] 100 (i)
Antimony	7440-36-0	14	340	(h)
Arsenic	7440-38-2	[2 (f)] 20 (e)	[2 (f)] 20 (e)	(h)
Barium	7440-39-3	700	47000 (n)	(h)
Benzene	71-43-2	3	13	1
3,4-Benzofluoranthene (Benzo(b)fluoranthene)	205-99-2	0.9	4	[500] 50 (i)
Benzo(a)anthracene	56-55-3	0.9	4	500
Benzo(a)pyrene (BaP)	50-32-8	0.66 (f)	0.66 (f)	100
Benzo(k)fluoranthene	207-08-9	0.9	4	500
Benzyl Alcohol	100-51-6	10000 (c)	10000 (c)	50
Beryllium	7440-41-7	1 (f)	1 (f)	(h)
Bis(2-chloroethyl) ether	111-44-4	0.66 (f)	3	[1] 10 (j)
Bis(2-chloroisopropyl) ether	39638-32-9	2300	10000 (c)	10
Bis(2-ethylhexyl) phthalate	117-81-7	49	210	100
Bromodichloromethane (Dichlorobromomethane)	75-27-4	[5] 11 (g)	[22] 46 (g)	1
Bromoform	75-25-2	86	370	1
Bromomethane	74-83-9	79	1000 (d)	1
2-Butanone (MEK)	78-93-3	1000 (d)	1000 (d)	50
Butylbenzyl phthalate	85-68-7	1100	10000 (c)	100
Cadmium	7440-43-9	1	100	(h)
Carbon tetrachloride	56-23-5	2 (k)	4 (k)	1
4-Chloroaniline	106-47-8	230	4200	(r)
Chlorobenzene	108-90-7	37	680	1
Chloroform	67-66-3	19 (k)	28 (k)	1
4-Chloro-3-methyl phenol (p-Chloro-m-cresol)	59-50-7	10000 (c)	10000 (c)	100
Chloromethane	74-87-3	520	1000 (d)	10
2-Chlorophenol	95-57-8	280	5200	[50] 10 (j)
Chrysene	218-01-9	9	40	500
Copper	7440-50-8	600 (m)	600 (m)	(h)
Cyanide	57-12-5	1100	21000 (o)	(h)
4,4'-DDD (p,p'-TDE)	72-54-8	3	12	[100] 50 (i)
4,4'-DDE	72-55-9	2	9	[100] 50 (i)

**Soil Cleanup Criteria (mg/kg)**  
(Last Revised — 2/3/84)

Contaminant	CASRN	Residential Direct Contact Soil Cleanup Criteria(a)(h)	Non Residential Direct Contact Soil Cleanup Criteria(a)(h)	Impact to Ground water Soil Cleanup Criteria(b)
4,4'-DDT	50-29-3	2	9	[100] 500 (i)
Dibenz(a,h)anthracene	53-70-3	0.66 (f)	0.66 (f)	[500] 100 (j)
Dibromochloromethane (Chlorodibromomethane)	124-48-1	110	1000 (d)	1
Di-n-butyl phthalate	84-74-2	5700	10000 (c)	100
Di-n-octyl phthalate	117-84-0	1100	10000 (c)	100
1,2-Dichlorobenzene	95-50-1	5100	10000 (c)	50
1,3-Dichlorobenzene	541-73-1	5100	10000 (c)	100
1,4-Dichlorobenzene	106-46-7	570	10000 (c)	100
3,3'-Dichlorobenzidine	91-94-1	2	6	100
1,1-Dichloroethane	75-34-3	570	1000 (d)	[1] 10 (i)
1,2-Dichloroethane	107-06-2	6	24	1
1,1-Dichloroethene	75-35-4	8	150	10
1,2-Dichloroethene (trans)	156-60-5	1000 (d)	1000 (d)	50
1,2-Dichloroethene (cis)	156-59-2	79	1000 (d)	[50] 1 (i)
2,4-Dichlorophenol	120-83-2	170	3100	10
1,2-Dichloropropane	78-87-5	10	43	(r)
1,3-Dichloropropene (cis and trans)	542-75-6	4	5 (k)	1
Dieldrin	60-57-1	0.042	0.18	50
Diethyl phthalate	84-66-2	10000 (c)	10000 (c)	50
2,4-Dimethyl phenol	105-67-9	1100	10000 (c)	10
Dimethyl phthalate	131-11-3	10000 (c)	10000 (c)	50
2,4-Dinitrophenol	51-28-5	110	2100	10
<u>Dinitrotoluene (2,4-/2,6- mixture)</u>	<u>25321-14-6</u>	<u>1 (l)</u>	<u>4 (l)</u>	<u>10 (l)</u>
Endosulfan	115-29-7	[3] 240 (g)	[52] 6200 (g)	50
Endrin	72-20-8	17	310	50
Ethylbenzene	100-41-4	1000 (d)	1000 (d)	100
Fluoranthene	206-44-0	2300	10000 (c)	[500] 100 (i)
Fluorene	86-73-7	2300	10000 (c)	100
Heptachlor	76-44-8	0.15	0.65	[500] 50 (j)
Hexachlorobenzene	118-74-1	0.66 (f)	2	[50] 100 (i)
Hexachlorobutadiene	87-68-3	[11] 1 (g)	[210] 21 (g)	[50] 100 (g)
Hexachlorocyclopentadiene	77-47-4	400	7300	100
Hexachloroethane	67-72-1	6	100	100
Indeno(1,2,3-cd)pyrene	193-39-5	0.9	4	500
Isophorone	78-59-1	1100	10000 (c)	[10] 50 (j)
Lead	7439-92-1	100 (p)	600 (q)	(h)
Lindane	58-89-9	0.52	2.2	[1] 50 (j)
2-Methylphenol	95-48-7	2800	10000 (c)	(r)
4-Methylphenol	106-44-5	2800	10000 (c)	(r)
Methoxychlor	72-43-5	280	5200	[500] 50 (i)
Mercury	7439-97-6	14	270	(h)
4-Methyl-2-pentanone(MIBK)	108-10-1	1000 (d)	1000 (d)	50
Methylene chloride	75-09-2	49	210	[10] 1 (j)
Naphthalene	91-20-3	230	4200	100
Nickel	7440-02-0	250	2400 (k) (n)	(h)
Nitrobenzene	98-95-3	28 520	[50]	10 (i)
N-Nitrosodiphenylamine	86-30-6	140	600	100
N-Nitrosodi-n-propylamine	621-64-7	0.66 (f)	0.66 (f)	[1] 10 (j)
PCBs (Polychlorinated biphenyls)	1336-36-3	0.49	2	[100] 50 (i)
Pentachlorophenol	87-86-5	6	24	100
Phenol	103-95-2	10000 (c)	10000 (c)	50

Soil Cleanup Criteria (mg/kg)  
(Last Revised — 2/3/84)

Contaminant	CASRN	Residential	Non	Impact to
		Direct Contact	Residential	Ground water
		Soil Cleanup	Direct Contact	Soil Cleanup
		Criteria(a)(b)	Criteria(a)(b)	Criteria(h)
Pyrene	129-00-0	1700	10000 (c)	[500] 100 (j)
Selenium	7782-49-2	63	3100 (n)	(h)
Silver	7440-22-4	110	4100 (n)	(h)
Styrene	100-42-5	23	97	100
1,1,1,2-Tetrachloroethane	630-20-6	170	310	1
1,1,2,2-Tetrachloroethane	79-34-5	34	70 (k)	1
Tetrachloroethylene	127-18-4	4 (k)	6 (k)	1
Thallium	7440-28-0	2 (f)	2 (f)	(h)
Toluene	108-88-3	1000 (d)	1000 (d)	500
Toxaphene	8001-35-2	0.10 (k)	0.2 (k)	[100] 50 (i)
1,2,4-Trichlorobenzene	120-82-1	68	1200	100
1,1,1-Trichloroethane	71-33-6	210	1000 (d)	50
1,1,2-Trichloroethane	79-00-5	22	420	1
Trichloroethene (TCE)	79-01-6	23	54 (k)	1
2,4,5-Trichlorophenol	95-95-4	5600	10000 (c)	50
2,4,6-Trichlorophenol	88-06-2	62	270	[50] 10 (i)
Vanadium	7440-62-2	370	7100 (n)	(h)
Vinyl chloride	75-01-4	2	7	[1] 10 (i)
Xylenes (Total)	1330-29-7	410	1000 (d)	10
Zinc	7440-66-6	1500 (m)	1500 (m)	(h)

**Footnotes**

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

Arthur D Little

**Final Report**

Distributions of  
Chemical  
Contaminants and  
Acute Toxicity in  
Delaware Estuary  
Sediments

Submitted to U.S. EPA and  
Delaware River Basin  
Commission

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June 4, 1994

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## Executive Summary

Arthur D. Little, Inc., performed a study in support of the following Delaware Estuary Program (DELEP) objectives:

- To determine spatial distributions of acute sediment toxicity throughout the estuary
- To compile and supplement existing data on toxic chemical contaminant concentrations in sediment, biota, and water
- To identify causative associations between chemical contaminants and acute sediment toxicity

The study objectives were addressed through two separate but related tasks. Historical data relevant to the DELEP study area were compiled for sediments and biota; data of acceptable quality were not available for water. In order to supplement the historical data and fill important data gaps, sediments were collected at 16 stations along the Delaware River and in Delaware Bay. Sediments were tested for acute toxicity to amphipods, and analyzed for a comprehensive suite of toxic chemical contaminants. Sediment from one of the Delaware River stations was used for a 28-day bioaccumulation test to assess the bioavailability of sediment-bound organic chemical contaminants.

### Sampling Design

The field sampling program featured a design strategy intended to (1) provide extensive spatial representation along portions of the Delaware River potentially influenced by industrial and municipal point and nonpoint sources of pollutants and (2) include sampling stations within the Delaware Bay that could serve as reference stations that reflect baseline conditions in the estuary. A total of four sampling areas, or "reaches" were established: Reach A spanning the Delaware River between River Mile 115 (Torresdale, Pennsylvania area) and River Mile 95 (south of the Walt Whitman Bridge); Reach B spanning the Delaware River from River Mile 95 to River Mile 80 (Marcus Hook); Reach C spanning the Delaware River from River Mile 80 to River Mile 60 (south of Pea Patch Island and north of the Chesapeake and Delaware Canal); and Reach D encompassing the mid-bay portion of the Delaware Bay from Stony Point, New Jersey, to Egg Island Point, New Jersey.

### Analytical Approach

The laboratory portion of this study consisted of static acute toxicity testing, a laboratory bioaccumulation test using field-collected sediments, and chemical characterization of field-collected sediments and organisms from the bioaccumulation test. A Quality Assurance Project Plan (QAPP) was developed for this study. The QAPP prescribed the methods to be used for all measurements, including quality

## Executive Summary (continued)

control measures, and established data quality objectives that were used to assure data quality.

Composited sediment samples, representing the upper 2 cm at each sampling station, were tested for acute toxicity (10-day static test) using amphipods, *Ampelisca abdita*, as representative benthic organisms. Separate aliquots of all sediment samples were analyzed for a comprehensive suite of environmental contaminants: polynuclear aromatic hydrocarbons (PAHs), including alkylated PAHs, polychlorinated biphenyls (PCBs) as specific congeners, priority pollutant chlorinated pesticides, priority pollutant metals, sulfide, total organic carbon, and grain size distribution.

Additional sediment representing the upper 10 cm of the sediment column was collected at Station 7 within Reach C (River Mile 70) for a 28-day bioaccumulation test. Two benthic marine species were used in the bioaccumulation test: the polychaete worm *Nereis virens* and the bivalve clam *Macoma nasuta*. Organism tissue samples were analyzed for the organic contaminants targeted in this study to document bioaccumulation.

### Results and Conclusions

#### *Spatial distribution of acute sediment toxicity*

This study greatly expanded the spatial characterization of sediment toxicity within the estuary. Acute sediment toxicity appears to be more widespread throughout the Delaware Estuary than previously indicated. Amphipod mortality exceeded 50 percent in two stations within Reach A, two within Reach B, one within Reach C, and one intended "reference" station within Reach D. Among-station differences in replicated toxicological variables (mortality to amphipods) were examined statistically using ANOVA and post-hoc pairwise comparison tests. Statistically significant acute toxicity was measured at four stations within sampling Reaches A and B, which correspond to the most highly urbanized and industrialized portion of the estuary.

#### *Associations of contaminant distributions with acute toxicity in sediments*

Contaminant concentrations in sediments were compared against sediment effects levels that have been shown to adversely affect benthic marine organisms. The No Observed Effects Level (NOEL)/Probable Effects Level (PEL) of MacDonald (1992), the Effects Range-Low (ER-L)/Effects Range-Median (ER-M) of Long and Morgan (1990), and recently published EPA Sediment Quality Criteria (EPA, 1993) were considered. Chemical contaminants that exceeded the lower effects values, i.e., NOELs or ER-Ls, were analyzed for correlation with toxicity across all stations. The following observations support our conclusions regarding chemical contaminants and sediment toxicity:

## Executive Summary (continued)

- Measured PCB concentrations exceeded sediment effects levels (NOEL) at 14 of 16 stations sampled, with the highest concentrations measured at stations within sampling Reaches A and B.
- Concentrations of DDT and its related DDE and DDD metabolites exceeded sediment effects levels (ER-L) at 15 stations, with the highest concentrations measured at stations within sampling Reaches A and B.
- Concentrations of dieldrin, another chlorinated pesticide, exceeded sediment effects levels (ER-L) at seven stations, with the highest concentrations measured at stations within sampling Reaches A and B.
- PAH concentrations, which were highly correlated with toxicity across the 16 stations, exceeded sediment effects levels (ER-L) at 10 stations, with the highest concentrations measured at stations within sampling Reaches A and B.
- Chromium, copper, mercury, lead, and zinc all exceeded sediment effects levels at stations within Reaches A and B.
- An SEM/AVS ratio greater than 1 appeared to provide a reasonable indication of acute sediment toxicity in the Delaware Estuary, but the ratio appeared to be very sensitive to accurate measurement of AVS.

In summary, acute sediment toxicity in the Delaware Estuary appears to be associated primarily with the presence of petrogenic PAHs, copper, and mercury at concentrations exceeding NOELs/ER-Ls, but not necessarily PELs/ER-Ms. The presence of zinc, the DDT-related pesticides, and PCBs at concentrations exceeding NOELs/ER-Ls appears to contribute to acute toxicity in sediments, but probably to a lesser extent.

### *Spatial distributions of chemical contaminants in Delaware Estuary sediments and implications of their bioavailability*

This study has expanded the Delaware Estuary Program database of high quality data for toxic chemical contaminants in sediments throughout the estuary. Several important conclusions pertain to distributions of contaminants and their bioavailability:

- PCBs are far more widespread than previously indicated in sediments throughout the estuary. This was determined as a result of using more sensitive analytical methods that quantify PCBs as individual congeners.

## Executive Summary (continued)

- PAH assemblages at stations within sampling Reaches A and B indicated considerable PAH inputs from up to several different petrogenic sources. A consistent background of pyrogenic, high-molecular-weight PAHs was evident throughout the estuary.
- PCBs, DDT-related pesticides, and to a lesser extent PAHs bound to sediments in the estuary are bioavailable to benthic organisms. Through food-chain transfer, the bioavailability of these toxic contaminants may result in adverse impacts to organisms that biomagnify these contaminants and may pose potential health risk to humans who consume fish from the estuary.

### Monitoring Recommendations

In anticipation that the Comprehensive Conservation and Management Plan for the Delaware Estuary will include provisions for monitoring the recovery of the estuary as management decisions are implemented, the following recommendations apply from the results of this study:

- Future chemical analyses should require (1) congener-specific quantification of PCBs to ensure quantification in the absence of identifiable Aroclor patterns and (2) a full complement of alkylated PAHs, in addition to those on the priority pollutant list, to document relative inputs of background nonpoint sources of pyrogenic PAHs and localized point sources of petroleum.
- Future toxicity testing in the estuary should consider sublethal responses in addition to mortality. Assays should include measurements of porewater salinity, and concentrations of unionized ammonia and hydrogen sulfide, which have been found to impart toxicity to sediments under conditions approaching anoxia.



The Greeley-Polhemus Group, Inc.

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December 22, 1995

Mr. Stan Lulewicz  
U.S. Army Corps of Engineers  
Philadelphia District  
100 Penn Square East, Wanamaker Building  
Philadelphia, PA 19107-3390

RE: Preliminary Draft Business Plan

Dear Stan:

I've enclosed four (4) bound and one (1) unbound copies of the Preliminary Draft of the Business Plan. Conceptually, the Business Plan is complete, but we are at a point where we need to make some decisions regarding our strategy for covering the debt service on the \$100 million non-Federal share of project costs. Given its status as a "working document", we expect to continue researching and consulting with you and your staff to ensure that we have a solid plan for DRPA to review.

At this point, the DRPA plan consists of two revenue producing business elements that look favorable:

- DRPA ownership of four dredged material disposal sites with disposal capacity of 17 million cubic yards.
- Wetland mitigation bank operations with 510 acres of land.

The other elements we considered - sale of sand and rock, and re-use of dried dredged material for landfill cover and other uses, do not appear to be viable because of transportation costs.

Based on our first-cut at the Plan, with conservative or cautious estimates and assumptions related to utilization of costs and prices (\$1.00 to \$2.00 per cubic yard), the capacity of the disposal areas is filled in 22 years. Also, the mitigation areas are fully utilized at \$150,000/acre in eight (8) years. At this point, after our "first-cut", we have a shortfall and can only support a bond issue of \$38 million. The bond shortfall is approximately \$74 million when we rely only on these sources.

The transportation and handling costs appear to limit the range of potentially interested customers for dredged material to five miles from the disposal sites. The rock, according to Chuck Woods at U.S.G.S., is probably Wissahickon Schist with little value. It would probably be good for airport runway substrate, but timing is wrong and other Corps sources will apparently be used.

We think it is probably a good time to have a brain-storming session, to see where we are:

- Does the plan look promising conceptually?
- What areas do we want to timber with to support the full \$100 million?

Several issues affect the disposal area revenues directly: the size of sites, the \$/cubic yard charged; and the mix of disposal area vs. wetland mitigation. These are issues that are best resolved face-to-face.

Mr. Lulewicz  
Page Two

December 22, 1995

The big problem is the capacity of the sites. Initially, we were anticipating the excess capacity of the four sites to be around 50 million cubic yards (based on analysis of information in the Feasibility Study). Increasing the capacity from your current estimate of 17 million cubic yards is one method for fixing some of the problem. This could be done by raising dikes, acquiring additional contiguous sites, and/or changing the mix of disposal and wetland mitigation at the sites (i.e., is there some optimum mix that will maximize our Business Plan's revenue potential?).

Perhaps we might want to recommend in the Plan that DRPA acquire the A.D. Company site and make DRPA into a regional monopoly. Raising disposal fees is another way to fix the revenue need, but there are obvious limitations. What will the Corps pay when current contract arrangements are for \$1.25/cubic yard? Equity from the states is a possibility as well as charging other project beneficiaries, but these ideas need to be well thought out and discussed first.

At this point, we have described the Plan and taken a cut at balancing the budget (sort of like President Clinton and the House of Representatives) but the budget is not balanced yet and we aren't sure how much to liberalize our costs (or if it matters), or what to do with the site capacity issue, and some other assumptions.

In order to explore the shortfall, we have developed Section 7.0 in the report to look at some options. What is the shortfall? What price do we have to charge to cover the total debt requirement? And, how would changes to some of the constraints we face work to balance our budget?

An interesting analysis presented in Section 7.0 varied some of the important disposal parameters (capacity, price, and inflows) to see if the shortfall can be eliminated. We discovered that, by doubling DRPA's capacity, increasing inflows by 500,000 cubic yards/year, and raising fees by a factor of five, we can easily close the gap. Obviously, there are many possible permutations that can satisfy the objective. We can discuss these further after you have read the report.

Although we are using Section 7.0 now to test the feasibility of the Business Plan and for the purpose of discussing where we are with you, this analysis will later support the recommended plan.

We would like to get together as soon as possible to discuss our approach. I think this Business Plan has the potential to be a powerful document as we continue to explore alternatives and expand our technical and market research.

Thanks for your help. Have a Happy Holiday!

Very truly yours,  
The Greeley-Polhemus Group, Inc.

*Van Dyke Polhemus*  
Van Dyke Polhemus  
President

IN MAKING ITS PROJECTION OF CRUDE IMPORTS, COE IGNORED RESULTING NEED FOR VERY SUBSTANTIAL NEW REFINING CAPACITY TO MEET COE'S IMPORT PROJECTIONS

- USING THE COE'S ORIGINAL PROJECTIONS, GROWTH ASSOCIATES ESTIMATES THAT FOUR (4) NEW 150,000 BBL REFINERIES (COST \$1.5-2.0 BILLION EACH) OR \$6-8 BILLION WOULD HAVE TO BE BUILT TO MEET COE'S FORECASTED CRUDE OIL IMPORTS (FIRST ONE WOULD HAVE OPENED IN 1990 AND THE SECOND IN 1994).
- USING THE 1995 ACTUAL FIGURES AS A BASE, BUT RETAINING THE COE'S GROWTH IN IMPORTS, WOULD REQUIRE ONE NEW REFINERY WHICH MUST OPEN IN 1997.
- THIS \$6-8 BILLION COST WAS NOT INCLUDED IN COE'S BENEFIT ANALYSIS. THEREFORE, IF COE'S IMPORT FIGURE IS CORRECT, ITS PROJECT COST FIGURE IS UNDERSTATED BY \$6-8 BILLION.
- IF ACTUAL 1995 IMPORTS ARE USED, BUT RETAINING THE COE'S GROWTH IN IMPORTS, THE PROJECT COST IS UNDERSTATED BY \$1.5-2.0 BILLION.
- IN FACT, DELAWARE VALLEY REFINERIES ARE RUNNING AT OR CLOSE TO FULL CAPACITY.

SOURCE: COE'S CONSULTANT'S 1993 REPORT<sup>1</sup>

- LOCAL REFINERIES CAN INCREASE CAPACITY MODESTLY BY TECHNOLOGICAL IMPROVEMENTS.

SOURCE: COE'S CONSULTANT'S 1993 REPORT.<sup>1</sup>

- SIGNIFICANT INCREASES IN CRUDE VOLUMES PROJECTED BY COE WOULD REQUIRE SUBSTANTIAL NEW REFINING CAPACITY (SEE GROWTH ASSOCIATES' ESTIMATE ABOVE).

SOURCE: COE'S CONSULTANT'S 1993 REPORT.

- CLAIMED BENEFITTING REFINERIES' ACTUAL PRODUCTION CAPACITY INCREASED AT ABOUT .8% ANNUALLY FOR THE PERIOD 1984- JULY 1995. THIS DID NOT REQUIRE CONSTRUCTION OF ANY NEW REFINERIES.

SOURCE: Oil and Gas Journal, Annual Refining Capacity Survey

- NO SIGNIFICANT REFINERY CAPACITY EXPANSIONS PLANNED FOR DELAWARE VALLEY REFINERIES. (ANY SUCH EXPANSION WOULD LIKELY FACE PROBLEMS UNDER TITLE V OF THE CLEAN AIR ACT.)
- THREE REFINERIES (ATLANTIC, CHEVRON AND BRITISH PETROLEUM) HAVE RECENTLY BEEN SOLD.

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<sup>1</sup>The COE's consultant on the channel deepening project also did a later study for the COE on deepening Big Stone Anchorage.

**RESPONSES TO MARITRANS' LETTER DATED FEBRUARY 18, 1997**

**RESPONSE TO COMMENTS CONTAINED IN SECTION II- SECTION A (1.).**

**Response to 1. Regulatory Background Pages 3-5.**

The *Final Interim Feasibility Report*, dated February, 1992 contains a discussion of alternatives, including the "no build" alternative, as well as a Clean Water Act Section 404 (b) (1) analysis, as required.

Responses to Comments Raised in Exhibit "A" :Delaware River: 45' Channel Project, Critique of U.S. Army Corps of Engineers, Project Feasibility Report and Benefit to Cost Ratio, Prepared By Maritrans, Inc., March 1996. and reiterated in Maritrans Letter, February 18, 1997, Section II-Section A(2.), A-H Pages 5-12.

**RE: ERROR #1 (Pages 5-11)**

Recent actual historic tonnage of total crude oil imports through the port calibrates closely with the DRI/McGraw-Hill projections in the Corps 1992 feasibility report. The Waterborne Commerce Statistics data for actual total crude oil imports through the port in 1995, is 55.675 million tons. Also, the Corps applied tonnage figures only for the specific subset of benefitting refineries in the economic analysis. The tonnage closely matches the Maritrans estimate, so there is not a projection error by the Corps. This compares closely to the DRI/McGraw-Hill 1995 estimate of 56.96 million tons. Thus, the projections are not overstated and the historic tonnage refutes the need for two refinery openings (1990 and 1994) to handle this tonnage.

Six facilities will benefit from the channel deepening with the deepening of their berths. This includes the Tosco refinery was re-opened in May 1997. The Corps anticipated a moderate increase in throughput capacity during the 50 year project life to handle the ultimate level of projected tonnage; this is considered reasonable through either implementation of a long-term capital investment program or future technological improvements.

**RE: ERROR #2 (Page 13)**

The per barrel lightering rate could not have been overestimated as stated since Maritrans provided the Corps with the rate. Maritrans also provided a lower lightering rate during the recent extensive coordination effort with the Corps. This rate was incorporated into the Corps updated benefit analysis.

**RE:ERROR #3 (Page 14)**

The percentage of lightering was established through coordination with the oil companies. Also, the difference between the Corps' 31% and Maritrans' 29% is relatively minimal and would

not affect project justification.

**RE: ERROR #4 (Pages 16-18)**

There has been consolidation of refinery facilities in the study area. After the consolidation, which included Sun Oil purchasing the Atlantic Pipeline (BP) and Chevron refineries in Philadelphia, and Tosco purchasing the British Petroleum refinery at Marcus Hook, a total of six refinery locations are still expected to benefit. This determination involved a combination of discussions with the refineries and consideration of present and future tanker characteristics and operations for both with and without the proposed channel deepening. Tosco corporation purchased the BP Marcus Hook refinery and temporarily shut it down in January 1996. currently, Tosco is completing, in 1997, a \$60 million upgrade and is reopening the facility under a new name, the Trainer refinery. The large magnitude of this capital investment clearly verifies Tosco's intent to continue refinery operations in at least a similar manner to BP's. Tosco has affirmatively indicated in recent discussions with the Project Sponsor, that it believes that it will benefit from the proposed project. Charles Zeien and Associates in its work effort for Maritrans, assumed that only three refinery locations could benefit. The Corps disagrees with this assessment.

Associated costs for these six oil refinery facilities (estimated at about \$20 million) have been included in the Corps benefit-cost analysis. The estimated associated costs for all project beneficiaries were based on interviews conducted by the Corps or Corps consultant, updated hydrographic surveys at the berths, rock surveys at Sun Oil and Tosco (formerly BP) berths, and cost data provided by the beneficiaries. This information or data was used in estimating the associated costs for each of the beneficiaries.

Lightering requirements will be reduced by a weighted average of 42%. For example, a 55 foot sailing draft tanker into Big Stone Anchorage will be able to reduce lightering requirements by 33% (the percentage to which Maritrans may be referencing from the Corps 1992 feasibility report). However, 50 foot sailing draft tankers, will reduce lightering requirements by 50%, and 45 foot sailing draft tankers by 100%. The weighted average is 42%. Regarding tankers size, the Corps has conservatively applied the same tanker fleet mix over the project life. If the Corps had projected larger tankers, benefits would be greater for the proposed channel deepening project.

**RE:ERROR #5 (Page 21)**

This position appears to have evolved from the coordination meeting that was held with Maritrans in early 1996. At that meeting, it was indicated to the Corps that Maritrans intends to reduce its lightering fleet if there is a 45 foot channel. If this should occur, other lightering companies, in the long run,

could be expected to serve as an alternative resource in the marketplace to assure that the most efficient lightering procedure continues to take place. The Corps' evaluation of project benefits incorporates this expectation.

#### **NON-PETROLEUM ASPECTS OF PROJECT BENEFITS (Pages 22-25)**

The Corps anticipates that container and dry bulk commodities will benefit from the deeper channel. The Corps feasibility study, applying detailed data directly provided by the Delaware River Port Authority (which involved coordination with shippers and nationally recognized consulting experts), included the introduction of post-Panamax container vessels for East-West trade routes through the port as a result of significant landside investments to include the Regional Intermodal Transfer Facility and the use of double-stacking by the three major railroads. Local port officials and shippers also support the result that steel scrap, iron ore, and coal imports will benefit from the deeper channel.

The Corps did conservatively assume that no induced tonnage would be incorporated into the economic analysis for the channel deepening. The potential for induced tonnage is very significant, however, and would result in additional project benefits, which have not been claimed.

Scrap tonnage services Turkey through the available deep-water port. Scrap tonnage to Turkey has dropped in recent years and the updated benefit analysis has incorporated this factor. However, conversely, the Korean trade route was conservatively not included in the benefit analysis. Although the shipper believed that a shift from the present Panama Canal route to the Suez Canal route with largest chartered vessels is very possible. This would result in additional project benefits which have not been claimed.

#### **RECENT DEVELOPMENT (Page 27)**

To reiterate, the Corps, applying Delaware River Port Authority data anticipates that container vessels will benefit from the channel deepening.

#### **OVERALL CONCLUSION (Page 28)**

Maritrans position of a 0.43 benefit-cost ratio is based on a drastic set of cumulative pessimistic assumptions including: only 50% of the beneficially impacted refineries can be included, and no scrap or container benefits are realized. The Corps does not agree with these pessimistic interpretations of the port's existing and future cargoes and vessel utilization. The extensive investigation process included input from shippers, the Delaware River Port Authority, pilots, and the nationally recognized economic consulting firm, DRI/McGraw-Hill. Data from this investigation was placed into the Corps conservative benefit

methodology; the 45 foot project is assessed to be economically justified.

**RESPONSE TO SECTION II-SECTION A (3.), PAGES 11-12.**

Once constructed, the 45 foot channel will benefit the local community through transportation cost savings promoting port competitiveness. The existing Delaware River Federal navigation project, which provides for a 40-foot channel, restricts efficient movement of both present and future tankers, dry bulk carriers, and container vessels. These conditions result in significant light loading and lightering costs and vessel delays. The oil refineries, container, and bulk cargo facilities along the Delaware River handle more than 70 million tons of cargo annually. This sector of the regional economy generates \$3.5 billion dollars in revenues, more than \$1 billion in wages, \$150 million in state and local taxes, and more than 30,000 jobs. The Delaware River port system is the last major East Coast port to consider improving its channel. Deepening the Delaware River main channel from 40 to 45 feet is essential to guarantee the future competitiveness of the local region's port facilities. The referenced December 1995 report provided a generalized analysis of the possible local and regional impacts of the channel deepening. The analysis from this consultant report was not used in the benefit analysis for the project. The lightering rate provided directly by Maritrans to the Corps was applied in the analysis.

**RESPONSES TO COMMENTS IN SECTION II-SECTION A (4.), PAGES 13-15**

The potential reduction of oil spills with the 45 foot channel deepening, although a positive project aspect, was only addressed qualitatively and was not included as part of the benefit analysis to determine project justification. In their letter of March 17, 1997, the EPA concurred that the Marine Spill Analysis System that has been developed by the Corps, NJDEP, USFWS, and the Environmental Systems Research Institute, as well as the oil spill response network that is in place, are adequate.

**RESPONSES TO COMMENTS IN SECTION II-SECTION B (1.), PAGES 15-16**

Cadmium and thallium were the only two contaminants detected in channel sediments that had mean concentrations above New Jersey Residential Surface Soil Standards in some reaches. Mean concentrations of selenium were below Residential standards in all reaches. See responses to the following comments.

**RESPONSES TO COMMENTS IN SECTION II-SECTION B (1.) paragraph a, PAGES 17-18**

Mean concentration of sediment contaminants along with the detection range were provided in the DSEIS as a means of displaying the results of a large sampling effort that produced a voluminous data set. The New Jersey Soil Cleanup Criteria were



used as a means of placing the sediment data in perspective because the New Jersey Department of Environmental Protection has indicated that they use the criteria for this purpose. The compliance requirements for achieving these standards indicate that the arithmetic mean of the concentrations of the contaminant in all soil samples in the area of concern is to be used for comparison to the standard (Site Remediation Program Cleanup Standards for Contaminated Sites Proposed New Rules: N.J.A.C. 7:26D from the New Jersey Register, February 3, 1992). There is no established procedure for evaluating sediment data. The data included in the DSEIS was also reviewed by the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service. These agencies have concurred with the conclusions reached in the DSEIS.

**RESPONSES TO COMMENTS IN SECTION II-SECTION B (1.) paragraph b, PAGES 18-19**

There are no Federal bulk sediment standards for evaluating impacts to groundwater. As part of the sediment quality investigations presented in the DSEIS, the bulk sediment data was compared to the NJDEP impact to groundwater soil cleanup criteria, again as a means of placing the data in perspective. All available standards were used, which did not include heavy metals. In addition to the chemical data collected for this project, the District has undertaken studies of the potential impact that dredged material disposal may have on groundwater resources (See Section 7 of the DSEIS). These studies have not identified any significant concerns relative to groundwater contamination.

**RESPONSES TO COMMENTS IN SECTION II-SECTION B (1.) paragraph c, PAGES 19-20**

The Final SEIS includes additional data that compares the PCB results generated by the Arthur D. Little study with PCB concentrations in the navigation channel. This information is presented in Section 4.6 of the Final SEIS. This data was collected at the request of the Delaware Department of Natural Resources and Environmental Control. While other contaminants were adequately addressed by the data presented in the DSEIS, a concern was expressed that PCBs should be evaluated using new state of the art high resolution techniques. As can be seen in Section 4.6, concentrations of PCBs in shallow water areas of the river are much higher than concentrations in the navigation channel. This is likely due to the fact that the navigation channel is regularly maintained, and contaminants have not been allowed to accumulate in the sediments over time. These results serve to confirm the previous conclusion that channel sediments are clean. In addition to the bulk sediment analyses, bioassays were run using channel sediments. No mortality was observed in any reach of the river. The amphipod *Hyalella azteca* was used as one of the test organisms.

**RESPONSES TO COMMENTS IN SECTION II-SECTION B (2.), PAGES 20-23**

Bioaccumulation tests were run on Reach E sediments because sediment from Delaware Bay will be placed in the aquatic environment for various beneficial uses. These tests were run at the request of several Federal and State resource agencies. These agencies did not request bioaccumulation tests on sediment that would be removed from the river and placed in dredged material disposal sites. In accordance with Section 7 of the Endangered Species Act, the District prepared Biological Assessments to evaluate the potential impacts of the project on Federally threatened and endangered species, including the bald eagle and the peregrine falcon. The U.S. Fish and Wildlife Service responded by preparing a Biological Opinion. The Service concurred with the District's position that the proposed project would not impact the bald eagle or peregrine falcon. As part of their opinion they stated: "Results of chemical analyses provided within the BA indicate that contaminant loads in the sediments are low. The mean and range of contaminant concentrations were provided for each reach of the proposed project area. Mean contaminant concentrations fell within ranges considered to be background for soils and sediments in New Jersey. Maximum concentrations that exceed background appear to be in isolated samples, and are, therefore, limited in spatial distribution. Additionally, no demonstrable acute toxicity or bioaccumulation of sediment-associated contaminants were demonstrated in laboratory tests."

**RESPONSE TO COMMENTS IN SECTION II-SECTION C (1.), PAGES 23-25**

The management of the new CDFs has been supported by the FWS, EPA, and NJDEP (See comment letters to the DSEIS). Most of the existing wetlands in the proposed CDFs are poor quality phragmites marsh. Please see the following responses: Oldman's 7 Responses 15, 22, and 37. In regard to mitigation banking, the Corps is not building any mitigation banks as part of this project. The sponsor is investigating the possible use of mitigation banking on land adjacent to the CDFs that they will own in order to generate revenue. Before these banks are constructed, they would need to receive approval from the NJDEP, and would need to demonstrate that it is beneficial to the wetland/wildlife habitat of the area.

**RESPONSE TO COMMENTS IN SECTION II-SECTION C (2.), PAGES 25-26**

The private mitigation bank is located adjacent to this proposed CDF. We will not impact the ongoing private wetland mitigation bank efforts. As described in the SEIS, the management of the CDFs as wetlands will be generally beneficial to most wildlife species.

**RESPONSE TO COMMENTS IN SECTION II-SECTION D, PAGES 26-29**

As a possible revenue source, the disposal of out-of-region

dredged material at the proposed sites it being evaluated by the sponsor. The concerns that are raised in this section are being evaluated by the Delaware River Port Authority to see if this option is environmentally and economically viable. The current plan presented in the Supplemental Environmental Impact Statement does not include use of the dredged material disposal areas for disposal of material dredged from places other than the Delaware River. Additional regulatory review and permitting would be required if the sponsor chose to pursue this option.



## WATERSHED ASSOCIATION

February 11, 1997

Mr. Robert L. Callegari,  
ATTN: Environmental Resources Branch  
U. S. Army Corps of Engineers  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390  
Via Certified Mail

RE: Delaware River Main Channel Deepening Project - Draft  
Supplemental Environmental Impact Statement

Dear Mr. Callegari:

On behalf of the Raccoon Creek Watershed Association, Inc., a non-profit New Jersey Corporation, I am requesting that a public hearing be held to consider the information set forth in the Supplemental Environmental Impact Statement prepared in connection with the proposed Delaware River Main Channel Deepening Project.

As you requested, the reasons for our request that a public hearing be held, in detail, are:

1. To discuss the impact of the creation of the four upland sites on surrounding uplands and wetlands.
2. To discuss the specific nature of the adverse environmental impacts which have not been avoided but allegedly have been "minimized."
3. To discuss the details on the impacts to water quality that will be created by the project.
4. To discuss and obtain information on the impact of the disturbance and release of toxic substances deposited in the dredged material over the years by, among others, Monsanto Co., Bridgeport; DuPont, Deepwater, Salem County; BP Exploration and Oil, Inc., Trainer Pa.; Mobil Oil, Paulsboro Refinery, Greenwich Twp.; Franklin Smelting and Refining, Philadelphia; Coastal Eagle Point Oil Co.. How will the disturbed toxins affect the water quality of the Raccoon Creek and the Delaware River, and the users of the sites where the dredged material will be deposited, human, animal and plant? How will the contaminants be measured? What containment measures will be implemented? PCBs, DDT and industrial solvents no longer in use, and substitutes for DDT such as malathion and other organophosphate pesticides will be able to

In regard to the request for a public hearing, please see response the Honorable Shirley Price, Delaware State Representative.

1. Impacts of the construction of the four new CDFs are discussed in detail in Sections 1.0, 3.2, 4.0, 6.0, and 7.0.
  2. The Philadelphia District believes that the nature and extent of all impacts that are expected to occur as a result of this project have been adequately discussed in the final EIS (1992) and this SEIS.
  3. Chemical and geotechnical investigations conducted during the PED phase of project development have supported the feasibility level conclusion that project construction and maintenance would not have an adverse impact on water quality. These investigations are presented in Sections 4 and 7 of the Supplemental Environmental Impact Statement.
  4. A hazardous, toxic and radioactive waste (HTRW) investigation was performed on the four new disposal sites. No evidence was uncovered to suggest that any of the sites have been used for industrial purposes, or that any HTRW has ever been generated, disposed of, stored or treated at any of the sites. Several localized areas of concern were tested and indicated minor exceedance of cleanup criteria. The areas were selected based on the presence of solid waste or debris in the vicinity. In addition background tests were performed in non-debris areas. During the pre-construction phase (Plans and Specification) additional testing at the proposed dredge sites will be performed in areas of concern to ensure that potentially contaminated soil is identified. Any soil found to exceed the regulatory levels will be removed prior to construction of the disposal sites.
- Bulk sediment testing in Reach B (the reach of the river that includes Raccoon Creek) did not identify contaminant concentrations that would be of concern to aquatic or terrestrial biota. High resolution PCB tests showed that PCB concentrations in the sediments are extremely low in comparison to what is found in shallow water shoal areas of the river. The highest detected concentration of PCBs was 0.15 parts per million, which is well below the New Jersey residential standard of 0.49 parts per million. Pesticides including DDT and malathion were not detected in the sediments. Water column bioassays did not show any mortality to aquatic organisms. Pursuant to the Federal Endangered Species Act, the U.S. Fish and Wildlife Service reviewed the sediment data and concluded that the proposed dredging and dredged material disposal plan would not have an adverse effect on endangered species including the bald eagle and the peregrine falcon. Concerns associated with bioaccumulation of contaminants, egg shell thinning and low hatching rates are unfounded.

Mr. Robert L. Callegari,  
ATTN: Environmental Resources Branch  
February 11, 1997  
Page 2

migrate up the food chain from the sediment introduced into the wetlands causing eggshell thinning, low hatching rates, etc. of endangered species currently nesting in the area, including waterbirds, eagles and other raptors, that might move into the new dredge-fill areas. Biological and aquatic test results of the proposed project to be discussed in detail.

5. To discuss the effect of the planned dredging on the 25-year estuary restoration and protection plan supported by the governors of Pennsylvania, New Jersey and Delaware on September 19, 1996.
6. To discuss the findings of reports commissioned by local and state environmental organizations prepared by NJ Audubon and Paul Kerlinger, Ph.D., ornithologist and former director of the NJ Audubon Society's Cape May Bird Observatory evaluating the condition of the Raccoon Creek, its wetlands and uplands, and the diversity of wildlife living on the creek, especially in the vicinity of the proposed new dredge sites, and the effect on them of creating new dredge sites and adding to existing sites. NJ Conservation Foundation and NJ Audubon Reports consider the location of the proposed new dredge sites as especially important for preservation.
7. To discuss stream monitoring results on the Raccoon Creek.
8. To discuss the introduction of non-native species, such as phragmites, into existing wetlands areas of the Raccoon Creek where they do not now exist as a result of the dredging and filling.
9. To discuss the impact on drinking water drawn from the Delaware River to service municipal and individual supplies.

Sincerely yours,

  
JO ANN A. LAUGHLIN  
President, Raccoon Creek Watershed Association, Inc.

5. Section 1.2.1 has been added to the final SEIS to discuss the effects of the project on the Delaware Estuary Plan.

6. A report by Dr. Kerlinger reviewing the draft SEIS is attached to a comment letter from Ms. Carole Brodtkin and is included in the "Comment and Response" section of the SEIS. Dr. Kerlinger's report is generally supportive of the proposed management of portions of the new CDFs as wetlands.

7. Coordination is on-going with the New Jersey Department of Environmental Protection regarding the scope of water quality monitoring that will be required in association with operating the dredged material disposal areas.

8. Phragmites exists in portions of all the new CDFs. It will be controlled with herbicides. This description has been added to Section 3.2.3 of the final SEIS.

9. Direct withdrawal of Delaware River water for municipal drinking water supply occurs upstream of River Mile 98, at about RM 110. At RM 98, the Delaware River Basin Commission (DRBC) has established standards for maximum allowable 30-day average chlorinity, presently set at 180 ppm. It is the zone at and upstream of RM 98 that the Delaware River directly recharges the PRM aquifer underlying the Camden (NJ) metropolitan area. Historic heavy withdrawal of ground water in this area has depressed the potentiometric surface as much as 100 feet below sea level, reversing the natural hydraulic gradient between the river and the aquifer.

The salinity model investigation demonstrated that even under a recurrence of the drought of record, chlorinity at RM 98 does not exceed the DRBC standard. It is concluded that there will be no adverse impacts on fresh water supplies, either direct withdrawals or ground water supplies, accompanying the proposed channel deepening.

Mr Robert L Callegari  
Planning Division  
Dept of the Army  
Philadelphia District of Engineers  
100 Penn Square East  
Philadelphia. PA 19107-3390

FEB 13, 1997

Dear Mr Callegari,

The Delaware River and Bay Shoreline Council has received a copy of the Draft Supplements Comprehensive Impact Statement, Delaware Navigation Study, Main Channel Deepening, January 1997. We thank you for this opportunity to explain why we oppose the deepening of the Main Delaware River Channel.

The Shoreline Council began it's work in 1972 as a citizen's resource committee of the First State Resource, Conservation and Development Program, Department of Agriculture. We have continued since 1988 as an independent council operating with the following major goals:

- 1). to promote public awareness and environmentally sensitive land use policies so as to protect and improve water quality of rivers and bays in Delaware.
- 2). to encourage public access to water-based recreation and shorelines.
- 3). to provide opportunities for exchange of information among citizens and public agencies.

In recent years the Delaware River has been "hailed as one of the world's top water quality success storys". This has been the result of three and one half decades of extreme effort by national, regional and state authority. And in addition, substantial investments from local governments, the general public and private industry.

During the past six years, the national, regional and state governments focused on developing a Comprehensive Management Plan (CCMP Sept 1996) for the Delaware Estuary to build consensus by citizen participation and local government input. It's purpose will be to further enhance river quality and protect natural resources. It envisions achieving a sustainable society for future generations. We know the Corps of Engineers has been a part of this endeavor, as has been the Delaware River and Bay Council.

Despite all this astounding support and progress, tremendous challenges still lie ahead. Such as-decades of unregulated discharges into the river that have left heavy metals, volatile organic chemicals and other chronic toxicity in bottom sediments. However, major efforts are now underway to control and remedy new discharges. In 1992 the Delaware River Basin Commission established a common set of water quality goals for the estuary.

A Toxic Action Plan is now adopted within the CCMP which has already included the development of a detox model to assess the effect of toxic pollutants on the achievement of water quality criteria to protect human health and prevent chronic impacts on aquatic life. With all this conscientious effort how can the Corps possibly propose to operate a major project of the sheer magnitude of the main channel deepening project under an exemption on water quality certification? The channel dredging imposes an inherently severe impact on the river and it's resources through redistribution of the bottom sediments, disturbance within the water column and impact along shorelines where silt is deposited. Further more, we have not seen any evaluation of environmental impacts or increased safety issues on the presence of supertankers within the river channel.

- 1.
  - 2.
  - 3.
- Another clear deficiency in your EIS is not addressing actions needed to protect historic Ft Delaware on Pea Patch Island. Fort Delaware is located within yards of the existing ship channel. The island is presently subjected to severe erosion due to surge from the existing ship traffic. Larger and heavier ships will require the Corps to build expensive jettys. You should be aware that Ft Delaware is on the list of National Historic Sites. I am sure that you personally admire the historic naval military value of Ft Delaware. As a State Park it hosts over 25,000 visitors a year.

These are some of the concerns of the Delaware River and Bay Council in reviewing the Corps EIS draft on the Main Channel dredging proposal. There are many people who have not yet received your proposal. It would seem appropriate at this time to call a public meeting.

Thank you for your kind attention-

Leah Roedel  
Delaware River &  
Bay Council  
6 Crestfield  
Wilm. DE 19810

*Leah R. Roedel*

1. Please refer to Delaware Audubon Society Response 4. Sediment contamination with the Federal navigation channel and port facility berthing areas that would benefit from the deepening project has been intensively studied over the last several years. Testing has included bulk and elutriate analyses, water column and whole sediment bioassays, bioaccumulation test, and most recently high resolution, congener specific PCB analyses. The results of these investigations are presented in Section 4.0 of the SEIS. To date, there has been no indication that dredging and dredged material disposal operations would have and adverse effect on aquatic resources in the Delaware River estuary. This conclusion is supported by the U.S. Environmental Protection agency, the U.S. Fish and Wildlife Services and the National Marine Fisheries Service. In additions, while the project is exempt from water quality certification, the states of Pennsylvania, New Jersey and Delaware did evaluate sediment contamination concern as part of their Coastal Zone Management Program consistency reviews. These State consistency determinations are required for project construction.

2. Please see response to Ms. Elaine DuBois, Oldman's Creek Watershed Association Response 63.

3. The erosion problem on the shoreline of Pea Patch Island is being addressed and will be resolved by the Corps of Engineers and Delaware DNREC as an issue independent of the proposed Main Channel Deepening.

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

EDNA S. LINK  
43 MORRIS AVENUE  
MANTUA, NEW JERSEY  
08057-1909

JANUARY 17, 1999

UNITED STATES ARMY CORPS OF ENGINEER  
MR. ROBERT L. CALLEGARI - CHIEF - PLANNING DIVISION  
PHILADELPHIA DISTRICT  
ENVIRONMENTAL RESOURCES BRANCH  
WANAMAKER BUILDING  
100 PENN SQUARE - EAST  
PHILADELPHIA, PENNSYLVANIA 19107-3390

MR. CALLEGARI,

I AM WRITING TO YOU ABOUT THE DELAWARE  
RIVER MAIN CHANNEL DEEPENING PROJECT (PUBLIC  
NOTICE NO. CENAP - PH - E - 99 - 01)

WILL YOU BE KIND ENOUGH TO SEND ME  
MORE INFORMATION, MAPS, ~~AND~~ ETC. ON THE FOLLOWING  
SITES 17G/15D/15G/RACCOON ISLAND

ALSO DREDGED MATERIAL FROM INITIAL PROJECT  
CONSTRUCTION WOULD BE USED FOR WETLAND RESTORA  
TION AT EGG ISLAND POINT, NEW JERSEY, AND KELL  
ISLAND DELAWARE / STOCKPILING OF SAND FOR  
LATER BEACH NOURISHMENT WORK AT SLAUGHTER  
AND BROAD KILL BEACHES IN DELAWARE

I AM INTERESTED IN WETLAND  
RESTORATION AND WILDLIFE HABITAT

WHAT IS THE EFFECT OF DREDGE

Ms. Link was sent a copy of the draft SEIS.



Jan. 23, 1997

Mr. Robert L. Callegari,

I am writing to you to request the Army Corps. of engineers hold a public meeting to discuss the issues concerning the Draft Supplemental Environmental Impact Statement for the Delaware River Main Channel Deepening Project.

I would like to see copies of the Draft Supplemental Impact Statement in some of our local libraries, such as the Gloucester County and West Deptford Libraries. I have concerns regarding the safety of this highly contaminated dredged material and its impact on the ground water.

One of the areas that is listed for disposal for the dredged material is the Pedricktown South and North sites also a new proposed site is listed at 15G, on the southern border along Oldman's Creek. A report was put out by the New Jersey Audubon Society for the New Jersey Conservation Foundation entitled the DELAWARE BAY AND RIVER TRIBUTARIES GREENWAY PROJECT. It states, "The Pedricktown Complex is a site extending from the Delaware River east to Route 295 along the lower reaches of Oldman's Creek. The site is well known and well reported as an endangered bird species site, one of the premier waterfowl sites in the state, an important migratory shorebird sites, and important raptor site. It is also one of the very best examples of tidal marsh habitat in the entire study area. It is the home for an incredible population of muskrats. With federal and state endangered species, with critical migrant populations, and abundant food, it is a critical migratory and wintering stopover site for many birds. It is threatened by a 350 acre development parcel on Route 130. The best outcome would be to acquire the large 350 acre fill for sale at Route 130 and let it undergo succession."

Thank-you,  
Elaine Nelson  
P.O. # Bx 174 Rt 130  
Swedesboro, NJ 08085

1. Please see response to Ms. Elaine DuBois, Oldman's Creek Watershed Association. Six additional libraries in Gloucester and Salem counties were sent copies of the draft SEIS.

2. The District has evaluated the potential for groundwater contamination from the disposal areas along the Delaware River and found the impact to be negligible. Models and investigations were conducted at National Park and Oldman's Disposal Areas and concluded that disposal operations will have a negligible effect on the groundwater in the vicinity of these areas. The proposed Site 15G is located adjacent to Oldman's Disposal area. The material to be disposed of is not "highly contaminated". In fact the material is essentially considered "clean" as measured against state and federal standards. This determination is supported by the U.S. Environmental Protection Agency (See comment letter dated March 17, 1997).

3. Please refer to Response 2 for the New Jersey Conservation Foundation.

In regard to a need for a public hearing, please refer to the response to the Honorable Shirley A. Price, Delaware House of Representatives.

Hamilton G. Pedrick Jr.  
6 West Mill Street,  
Bridgetown, NJ 08001

1-20-87

Mr. Robert L. Callegari  
Attn: Environmental Resources Branch,  
U.S. Army Corps of Engineers,  
Wannamaker Building, 100 Penn Square East,  
Philadelphia, Pa. 19107-3390  
Dear Mr. Callegari:

Living in the area which will receive most of the disposal material I feel that a Public hearing should be held. Pennsylvania and Delaware state will not be receiving a great amount of disposal material. You have covered the libraries of Pennsylvania, Delaware and North Jersey but not South Jersey. (Bridgton) Missing are the following:  
City of Salem, 120 West Broadway, Salem, NJ  
PennsGrove-Carneys Point Library, PennsGrove, NJ  
Woodstown-Pilesgrove Library, 14 School Land, Woodstown, NJ  
Elmer Public Library, South Main St, Elmer, NJ  
Swedesboro Public Library, 42 Kings Highway, Swedesboro, NJ  
Paulsboro Library, Off Broad St, Paulsbor, NJ  
Was it an oversight not covering our libraries in South Jersey.  
We have a RIGHT TO KNOW the details of the spoils to be dumped on our arears.

Sincerely,

*Hamilton G. Pedrick Jr.*  
Hamilton G. Pedrick Jr.

Please see response to Ms. Elaine DuBois, Oldman's Creek Watershed Association. Six additional libraries in Gloucester and Salem counties were sent copies of the draft SEIS.

**James S. Zimmerman**  
363D Bay Ave., Slaughter Beach  
Milford DE., 19963  
February 12, 1997

US Army Corps of Engineers  
Wannamaker Bldg  
100 Penn Square East  
Philadelphia, PA 19107-3390

Attention: Mr. Robert Callogori, Environmental Research Branch  
Subject: Delaware Bay Channel Dredging & Dune Replenishment

Dear Sir,

I am writing on behalf of several interested residents of the Slaughter Beach community. It is our understanding, through reports in the local newspapers, that the COE is preparing preliminary plans and justifying the deepening of the navigation channel in the Delaware Bay and River. Obviously, for economic and environmental purposes, we are totally in agreement with this initiative.

Our particular local interest is in the proposed rebuilding of the dunes, along the bay shore. We are interested in any of the following activities which may commence:

- o Timing of planning, authorization, funding and implementation of the dredging & dune replenishment.
- o Newsletters (please put me on your distribution list for further dissemination within the community).
- o Public hearings (Please advise in advance, so interested citizens may attend).
- o Anything that would be newsworthy or requiring grass-roots support--for our citizens.

I want to assure you that our interest is positive, that we are very favorably in support of this worthwhile expenditure of Federal and State funds. In other words, we want to help in the process if there is anything we can do. Please advise your initial schedule of pursuit. I can be reached via internet: JimZimmie@AOL or by fax or phone: 302-422-3213. Thanks for your interest.

Sincerely,



James S. Zimmerman

363D Bay Ave. Slaughter Beach, DE. 19963

The sand material from the proposed project will be stockpiled offshore in the vicinity of Slaughter Beach. Sand from this site, will be directly placed on Slaughter Beach by the State of Delaware. This office and State of Delaware will keep you abreast of any future efforts.

John C. O'Herron, II

220 Washington Street

Mount Holly, New Jersey 08060-1646

Voice and facsimile (609) 261-0711; e-mail JOHERRON@VOICENET.COM

February 15, 1997

Mr. John Brady  
Environmental Resources Branch  
Department of the Army  
Philadelphia District, Corps of Engineers  
Wanamaker Building, 100 Penn Square East  
Philadelphia, Pennsylvania 19107-3390

Re: U.S.A.C.O.E. 1997. Draft supplemental environmental impact statement. Delaware River comprehensive navigation study. Main channel deepening project.

Dear Mr. Brady:

At long last, I have reviewed the above-referenced document. The document contains much material that I could, and probably should, remark upon. However, my time for that is limited and I will restrict my comments to the federally endangered shortnose sturgeon (*Acipenser brevirostrum*).

The basic information (i.e. original research material) that was utilized in the document regarding shortnose sturgeon in the Delaware Estuary is not only dated (studies ended in 1987), but also does not reflect the current circumstances of shortnose sturgeon occurrence. The organic pollution of the Delaware Estuary has become less and less of a problem since the last shortnose sturgeon studies were conducted and the area of the 'Philadelphia pollution block', so often referenced, no longer prevents the passage of fishes; in fact it is good fish habitat on a year-round basis in many places. To be succinct, today's watery world of the tidal Delaware River and Bay is not that of the 1980's - not for sturgeon, not for us. Our understanding of Delaware Estuary shortnose sturgeon is quite limited, because those studies in this system are so few. Also, it is erroneous to assume that the behavior of shortnose sturgeon in the Delaware Estuary is wholly comparable to that of this species in other systems due to differences in latitude and system characteristics. Hence, it is necessary to learn (*learn anew*, not extrapolate from dated, non-targeted, geographically removed studies) about the seasonal movement patterns of shortnose sturgeon in the middle and lower estuary. The studies conducted in the upper estuary (essentially the tidal Delaware River upstream of Marcus Hook) can only hint at what occurs elsewhere in the estuary. To date, no one has resolved, or even touched upon, the temporal and spatial occurrence aspects of shortnose

O'HERRON BIOLOGICAL AND ENVIRONMENTAL CONSULTING

On November 26, 1996 the National Marine Fisheries Service (NMFS) issued a "Biological Opinion" for all dredging projects permitted, funded, or conducted by the District, including the channel deepening project. The Opinion stated that dredging projects within the Philadelphia District may adversely affect sea turtles and shortnose sturgeon, but are not likely to jeopardize the continued existence of any threatened or endangered species under the jurisdiction of the NMFS for dredging activities within the District. The draft SEIS was reviewed by the National Oceanic and Atmospheric Administration (NOAA), the parent agency of the NMFS. Please refer to their comments and NOAA Responses 11, 12, and 13. In addition, Mr. O'Herron's letter was sent to the National Marine Fisheries Service for review, in light of his concerns. NMFS responded (Karen Green, Personal Communication, February 24, 1997) that:

1. The Delaware Basin Fish and Wildlife Management Cooperative's restrictions on dredging were sufficient to protect the shortnose sturgeon.

2. The behavior of juvenile shortnose sturgeon is still not known.

3. The finding of the "Biological Opinion" are valid. If their recommendations are followed, there will be no jeopardy to this species. However, consultation may be reinitiated if conditions change, or the take authorized by the Incidental Take Statement is exceeded.

4. Additional studies of the age structure and sex ratios of shortnose sturgeon populations in the Delaware River, feeding habits, and areas of significant habitat would provide insight into the behavior of this species in the Delaware River, especially the juveniles. However, these studies are not required under the terms of the Biological Opinion; they are considered conservation recommendations.

sturgeon young (young-of-the-year and older juveniles) in the Delaware Estuary. The protection of this life stage(s) is critical to the survival of the population. There is every reason to believe that these young are to be found along the freshwater side of the oligo/mesohaline transition boundary within the federally maintained navigation channel. This puts the young at considerable risk, especially since they likely occur on a seasonal basis in the vicinity of Marcus Hook where both dredging and blasting are planned to occur.

Some basic aspects of shortnose sturgeon behavior have not been fully exposed in the document. Shortnose sturgeon is the only federally listed endangered species that is virtually restricted in its occurrence to the federally maintained navigation channel and associated comparable depths from Trenton to below the Walt Whitman Bridge. I have received anecdotal accounts from commercial fishermen that shortnose sturgeon also inhabit the deeper waters (read navigation channel and anchorage areas) within the lower estuary. Certainly I questioned such reports as they may suffer from misidentification with the juvenile Atlantic sturgeon (*Acipenser oxyrinchus*) that are often abundant in the lower estuary. However, shortnose sturgeon do frequent the lower estuary and occurrence within the deeper waters is consistent with their behavior elsewhere in the estuary. With this information, one must recognize that the proposed dredging project will impact a great deal of shortnose sturgeon habitat in one fell swoop, and then again and again as needed to maintain the proposed additional five feet of project depth. We now know that adult shortnose sturgeon can be entrained by hydraulic dredges (incident of 1996 in the Trenton-Roebling area), and so, all life stages in the immediate vicinity of dredging activity are potential entrainees. What other federal or state protected species within the Delaware Estuary will endure such impact to members of its population and disruption to its habitat when, truly, so little is known about its occurrence from Philadelphia to the sea (yes, they do enter coastal oceanic waters without a problem). How does one protect the young, one of the critical early life history stages for which precious little is known from any system? Where and when are the young in the Delaware Estuary? I have provided an educated guess, but without reproducible field documentation it is only a surmise and when dealing with an endangered species that is not enough upon which to base any project.

The shortnose sturgeon of the Delaware estuary are very frequently found in aggregations ranging in numbers of a few to thousands (in this latter occurrence, greater than 50% of the adult population may be present) of individuals. Such aggregation behavior is also known of shortnose sturgeon from other systems. The predisposition to occur in aggregations makes a large number of individuals vulnerable to negative impacts at any one place or time. So much so, that when one encounters a dead shortnose sturgeon the first question to ask is, "How many others?", and not, "Were there any others?".

My more specific comments are directed to the page(s) of occurrence:

**Page 1-17. Section 3. Shortnose Sturgeon**

The recommended dredging windows of the Delaware Basin Fish and Wildlife Management Cooperative (DBF&WMC) were not designed to protect shortnose sturgeon, rather they are

**O'HERRON BIOLOGICAL AND ENVIRONMENTAL CONSULTING**

better geared to protecting more fully-anadromous species such as American shad (*Alosa sapidissima*), river herrings (*Alosa* spp.), and striped bass (*Morone saxatilis*). The reasons as to why the dredging restrictions do not protect shortnose sturgeon are:

1. Dredging (hydraulic and bucket), blasting, and overboard disposal can be conducted year-round from the Delaware Memorial Bridge (River Mile 68.7) at Wilmington, Delaware to the mouth of Delaware Bay/Atlantic Ocean (River Mile 0.0); thusly, there are no protective measures in place there for shortnose sturgeon. This area frequently encompasses the oligo/mesohaline transition boundary (presumed location of the young), the position of which is governed by the interplay of seasonal and tidal influences. Atlantic sturgeon sampling efforts in the general vicinity of the Chesapeake and Delaware Canal (River Mile 58.6) during recent years have produced a number of shortnose sturgeon as well. This is not unexpected since shortnose sturgeon have an historic occurrence in the middle and lower estuary.

2. Hydraulic dredging is prohibited only from mid-May to mid-June from the Delaware Memorial Bridge to upstream beyond the terminus of the proposed depth increase. Unfortunately, adult shortnose sturgeon and the oligo/mesohaline transition boundary are present during the remainder of the year when unrestricted hydraulic dredging is permitted. Blasting is permitted here from 1 December to mid-March, a period when the oligo/mesohaline transition boundary should be well-displaced downstream from the Marcus Hook area (ca. River Mile 79.5) and when *most* adult shortnose sturgeon *should be* in the Florence-Trenton, New Jersey (ca. River Miles 121-133) vicinity or in the lower estuary. However, the wintertime occurrence of young and adult shortnose sturgeon between Cherry Island Flats (River Mile 73.5) and Little Tinicum Island (River Mile 85.5) has never been assessed and no assumption can be made that shortnose sturgeon will not be present during blasting operations at Marcus Hook. Marcus Hook is centered in the suggested area and the involved distance is comparable to that covered by shortnose sturgeon overwintering in the upper estuary. However, the overwintering dynamics of shortnose sturgeon in the Marcus Hook area may be different - no one knows.

#### Page 10-16 and 10-17. Section 10.1.2.3 Shortnose Sturgeon

**Paragraph #1. The shortnose...** The field data that was utilized to author *A biological assessment of shortnose sturgeon (Acipenser brevirostrum) population in the upper tidal Delaware River: Potential impacts of maintenance dredging* was gathered prior 1985 and, though informative in many regards, is not wholly relevant to the impacts of navigation dredging from Philadelphia to the sea upon shortnose sturgeon. It is a useful document, when connected with later work, for considerations of dredging impacts upon shortnose sturgeon from Philadelphia to Trenton. The great improvement in tidal Delaware River water quality since 1986-87, as measured by dissolved oxygen concentrations, obviates some of the thought contained in that document. To be exact, the document is somewhat out-of-place and out-of-time.

**Paragraph #2. Shortnose sturgeon spawn...** In actuality, spawning activity in the Delaware may occur as early as late March and extend into the first week of May. There is considerable year-to-year variability and in some years environmental factors (current played against

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temperature) may confound successful spawning. When this happens, the unspawned fish leave the spawning grounds and absorb the ova over the course of many months. Needless to say, annual recruitment levels are variable in response to ambient conditions on the spawning grounds.

**Paragraph #3. Shortnose sturgeon range...** With the advent of the Delaware Estuary Program, it is correct to consider all areas of the Delaware Watershed that are flowed by the tide as being the 'Estuary'. This even includes areas of appreciable gradient, a hundred or so miles from the sea, where purely freshwater backs-up on the high tide and the presence of oceanically-derived salts is more of a theoretical consideration than an analytical fact. Therefore, what is true is that the greatest proportion of an watershed system's shortnose sturgeon population occurs on the freshwater side of the oligo/mesohaline transition boundary.

**Paragraph #4. Sampling by...** Yes, we did locate a dense and populous overwintering aggregation of shortnose sturgeon in the federal navigation channel within the Trenton area during Winter 1985-86. Moreover, this occurrence has been reliably predictable on an annual basis. This information does not speak of the remainder of the population, which is at least equally important, that could just as easily occur at the same dense and populous levels in the federal navigation channel where project deepening is proposed. The problem with this paragraph is that it directs attention away from the proposed project area, does not address the meaningfulness of the calculated numbers of overwintering individuals versus calculations of the adult population size, and fails to ask as to where the remainder of the population is. I will ask that, "Where is the remainder of the population during the wintertime?". It has not been studied and so it is not known.

**Paragraph #5. In the...** The cited Hastings (1983b) document should be reread. Hastings had cited some works by Dadswell and Dadswell et al. regarding the Saint John River, New Brunswick, Canada, but concluded that a downstream movement in August would seem to be precluded by the pollution block. He did state that catches in the Duck Island area were consistently high in Fall, 1983, but fell off in the winter after November and indicated that the population begins to leave the area for the winter. He did not say where to, as we did not have a clue to the actualities, but stated that the use of ultrasonic telemetry should provide information on this problem. It was not until December, 1984, that we began to get clear evidence that shortnose sturgeon were overwintering in the upper tidal Delaware River. Later, through the use of gillnet sampling and telemetric observations, we were able to demonstrate the existence of highly populous, dense overwintering populations in discrete areas. These overwintering aggregations can become so well-defined that gillnets set mere meters away will not recover a single individual. This was why it appeared that the shortnose sturgeon migrated from the Duck Island area in the wintertime.

According to the best information available (remember, field work stopped in 1987), immediately after spawning shortnose sturgeon speedily migrate into the Philadelphia area (certainly at least slightly below the Walt Whitman Bridge at River Mile 96.8) where they move about very little and then, in a matter of days (few individuals) and weeks (most individuals), to a few months (few individuals), return to the Duck Island area (Florence-

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Trenton). Up until 1986-87, the pollution block was pretty much in place, but since that time there has been no persistent pollution barrier to the passage of fishes through the Philadelphia area. The movement patterns of shortnose sturgeon during the 1990's and beyond is likely quite different from that observed during the 1980's when most of the population was pollution-locked into the upper tidal Delaware River. With that in mind, shortnose sturgeon occurrence within the federal navigation channel from Petty Island (River Mile 103) to the sea may be far more persistent than earlier imagined.

**Page 10-18. Section 10.3 Section 7 Consultation**

The biological assessment of impacts to shortnose sturgeon as a result of the proposed channel deepening project used dated material that is out-of-place and some of its assertions are incorrect. Furthermore, that assessment cannot speak to the occurrence of shortnose sturgeon young. It is more than likely that the young are negatively impacted (this connotes negative impact to the entire population and lessens its' survivability) by routine maintenance dredging conducted from the oligo/mesohaline transition boundary to upstream. The proposed project will require dredging in the presumed area of greatest young shortnose sturgeon occurrence for an extended period of time. The impact will be chronic and acute. A *no impact* conclusion is inappropriate until the temporal and spatial occurrence of these young has been clearly documented and it is demonstrated that the project can be accomplished without jeopardy to the species. Loss of an indeterminate number of young constitutes jeopardy to the species, until such time as provisions to safeguard the young are put in place. It is impossible to conduct this project with a lack of knowledge regarding the whereabouts of the young and at the same time guarantee no negative impact/jeopardy to the Delaware Estuary's shortnose sturgeon population.

**Pages 10-19 and 10-20. National Marine Fisheries Service (NMFS)**

**Paragraph #1. In September...** The document *A biological assessment of shortnose sturgeon (Acipenser brevirostrum) population in the upper tidal Delaware River: Potential impacts of maintenance dredging* is, for the larger part, wholly inappropriate for addressing the impacts to be realized from the proposed Philadelphia to the sea navigation channel project. Please see my prior comments under Page 10-16 and 10-17. Section 1.2.3 Shortnose Sturgeon: Paragraph #1.

**Paragraph #2. Second sentence. The area,...** This statement was appropriate 10 and more years ago. However, in recognition of the removal of the pollution block since that time it is now without basis and incorrect. Within the past ten years, shortnose sturgeon have been captured well-within the Philadelphia area between River Mile 103 at Petty Island and Fort Mifflin, Pennsylvania at River Mile 91 during late May. At the present time, there is no reason to think that many shortnose sturgeon, along with multitudinous other fish, do not utilize the federal navigation channel in the Philadelphia area during the summer months.

**Paragraph #2. Third sentence. South of...** All else being equal, shortnose sturgeon occurrence should lessen not as one passes south of Wilmington, but rather as the distance within saline water increases from the oligo/mesohaline transition boundary, a seasonably

O'HERRON BIOLOGICAL AND ENVIRONMENTAL CONSULTING



variable boundary. The very infrequent occurrence of young should be expected on the seaward side of the transition boundary.

**Paragraphs #3. Although ... and #4. The Philadelphia...** The dredging restrictions are not protective of shortnose sturgeon within the proposed project area. Please see my prior comments under Page 1-17. Section 3. Shortnose Sturgeon.

**Page 10-29. Section 10.4.2.4 Shortnose Sturgeon**

**Sentences #1-4 and #6.** Please refer to all of my prior commentary as regards these sentences.

**Sentence #7.** Shortnose sturgeon in the upper Delaware Estuary have demonstrated a strict affinity to the federal navigation channel and comparable depths, as previously discussed herein. If this behavior holds true, even in part, within the middle and lower estuary, then the dredging project will also acutely impact shortnose sturgeon habitat on a large scale.

**Sentences #8 and #9.** Firstly, the dredging did not encompass the area between Philadelphia and Trenton, rather it was a small stretch (River Miles 129.1 to 130.5) of federal navigation channel in the Duck Island and Perriwig Ranges between Bordentown and Trenton that also included the dredging of the PSE&G Mercer Generating Station's barge bay (River Mile 130.4). The studies by Rutgers did not identify any shortnose sturgeon remains for any one of a number of reasons. Yes, it is very possible that no shortnose sturgeon were entrained by the hydraulic cutterhead dredge that was working the study area. However, we only observed 12 fish (white perch, *Morone americanus*, and catfish, *Ameiurus/Ictalurus* spp.) over the course of 50 days. We thought that to be peculiar, considering that the entrained species were two of the most populous fishes in the study area (in the upper estuary as well), are benthically-oriented and not fast, powerful swimmers. Possibly the negatively buoyant victims sank in the pumped slurry and only a few of them rose to the surface upon decomposition. Keep in mind that the observations were conducted from 15 September through 3 December, a time when fish activity goes from high to low, but not so low as to prevent relatively rapid escape movement. During the period of dredge spoil observations, we also captured more shortnose sturgeon away from the working dredge than we did near it, suggesting their active avoidance of the device. Until February-March, 1996, when two dead adult shortnose sturgeon were found in the Biles Island dredge spoil disposal area (River Mile 130.5) there seemed to be no reason since 1983 to think that adult shortnose sturgeon would, or could, not avoid a hydraulic dredge. During the wintertime, shortnose sturgeon are unpredictably capable of sudden and rapid movement even though metabolic rates are lowered during the winter months. Although shortnose sturgeon are relatively fast and powerful swimmers, that is apparently not enough to protect them from hydraulic dredge entrainment and our thinking must be realigned to acknowledge that fact.


**Page 10-31. Section 10.5.2.3 Shortnose Sturgeon**

The dredging restrictions are not protective of shortnose sturgeon within the proposed project area. Please see my prior comments under Page 1-17. Section 3. Shortnose Sturgeon.

O'HERRON BIOLOGICAL AND ENVIRONMENTAL CONSULTING

In conclusion, it is my opinion that the gaps in knowledge regarding the temporal and spatial occurrence and use of the Delaware Estuary, from Philadelphia to the sea, by all free-swimming life stages of shortnose sturgeon are as massive now as they were a century ago. Routine navigation channel maintenance dredging has likely been impacting shortnose sturgeon young since the advent of hydraulic dredging on the freshwater side of the oligo/mesohaline transition boundary. The dredging has certainly created and destroyed shortnose sturgeon habitat; not a mixed blessing since the shortnose sturgeon's affinity to the deepest water available in a given area subjects them to chronic negative impacts from dredging. The presentations within the above-referenced draft supplemental environmental impact statement that indicate *no impact/jeopardy* to shortnose sturgeon as a consequence of the proposed channel deepening or that suggest the protective efficacy of the DBF&WMC dredging restriction are ill-founded at best; because they are based upon a lack of knowledge, rather than upon facts that are consistent with the present day environmental conditions/quality of the Delaware Estuary. The gaps in knowledge need to be resolved in order to satisfactorily ensure that the proposed project will be conducted in such fashion that the rare (extremely so, relative to the other fishes of the Delaware Estuary) and endangered shortnose sturgeon remains protected from negative impacts that will destroy its young and reduce its numbers thereby jeopardizing this species' continued existence.

Sincerely yours,



John C. O'Herron, II

att: Qualifications statement.

O'HERRON BIOLOGICAL AND ENVIRONMENTAL CONSULTING

John C. O'Herron, II  
220 Washington Street  
Mount Holly, New Jersey 08060-1646  
1-609-261-0711

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## QUALIFICATIONS STATEMENT

Over twenty years experience with fishes of New Jersey, Pennsylvania, and Delaware. Published authority on the biology and ecology of the federally endangered shortnose sturgeon in the Delaware River estuary. Advisor to state and federal agencies on issues involving shortnose sturgeon and other fishes. Has conducted investigations of water quality, ichthyoplankton, fish, benthic invertebrates, wetlands, and terrestrial and aquatic habitats. Designed mitigation projects for wetland and aquatic habitat losses. Conducted studies of impacts of hydraulic dredging upon shortnose sturgeon. Has monitored and written about the impacts of bucket dredging upon water quality. Within the past fourteen years, have conducted over twenty field studies in the Delaware River system in which fish, invertebrates, water quality, and/or aquatic habitats were the major topics. Within the last three years has co-authored three publications for the EPA's Delaware Estuary Program regarding fish, habitat, and/or toxic substances; the most recent being *A Scientific Characterization of the Delaware Estuary*.

### Education:

Rutgers University, The Graduate School: Master of Science, Biology, 1976.  
Widener College: Bachelor of Science, Biology, 1975.  
PMC Colleges: Bachelor of Science, Business Administration (Economics), 1969.

### Experience:

1993 to present. O'Herron Biological and Environmental Consulting.

1988 to 1993.

T. Lloyd Associates: Assistant director of a firm that conducted aquatic and terrestrial field studies, evaluated biological conditions for environmental impact and assessment statements, performed literature surveys, and advised individuals and agencies at all levels in both the public and private sectors.

1974 to 1976 and 1980 to 1987.

Department of Biology and Center for Coastal and Environmental Studies, Rutgers University: Instructor and Graduate Research Assistant. Conducted research on the biology and ecology of shortnose sturgeon in the Delaware River; duties included responsibility for daily operations, budget, personnel, maintenance, and reports. Conducted water quality sampling and analysis for the Batsto River pilot study. Lectured general ecology course. Instructor of laboratory sessions for general biology and general ecology courses. Verified identifications and documentation of herbarium specimens.

1977 to 1980.

Esschem Company, Division of Sartomer Industries, Inc.: Shift Production Supervisor. Directed production and maintenance personnel of a multi-million dollar firm in the production of highly specialized resins.

### Affiliations (Professional, Institutional and etc.):

Academy of Natural Sciences of Philadelphia	Ecological Society of America
American Fisheries Society	New Jersey Academy of Sciences
American Littoral Society	New Jersey Audubon Society
Delaware Riverkeeper Network (Board of Trustees)	Philadelphia Botanical Club

O'HERRON BIOLOGICAL AND ENVIRONMENTAL CONSULTING

4595 Painted Sky Road  
Reading, PA 19606  
June 26, 1997

Mr. John Brady  
U.S. Army Corps of Engineers  
District 100  
Penn Square East  
Philadelphia, PA 19107-3390

RE: Dredge Dumping in the Del. Bay

Dear Mr. Brady:

Our names are Mr. Edward & Theresa Maciejewski, and our son & daughter, Mark & Michele Maciejewski. We are writing to you in regards to the dumping idea into the Del. Bay w/or Del. water ways. We are a few of the thousands whom believe this is a extremely unwise choice on your part. My family are current recreational fisherman of the Del Bay water ways; and have been for many, many years; & want it to stay that way for years to come. We, as well as the signed enclosed names, feel this plan to proceed with dumping into those water ways would be a horrible injustice to those water ways, the natural wild life that lives there, & the overall consideration for the environment involved.

We do purpose an alternative method to your dumping plan. We purpose that you dump into fields far away from the water ways. The benefits are a plus to the soil over time and will not harm the ecological cycle.

I have always thought the Army Corps of Engineers were of extreem, upmost intelligence, however after reading the article in the "Fisherman" magazine of the May 29, 1997 issue, page 8; I (as well as others), have some doubt & question your logic behind this so called, "idea" to dump into Del. Bay waters.

We mean, who ever heard of taking mud & sludge from one body of water and dumping it into another body of water that is vibrant, and full of natural, living, wildlife; anyone knows that if you were to dump into the Del. water ways, ie) the Bay, you are going to KILL the natural, living, eco-cycle. It's not good for any water life form in the Reef beds. This is a natural breeding grounds for ALL kinds of water life in Delaware area, and surrounding water ways.

We, the enclosed list of names STRONGLY encourage you to reconsider your choice of dumping sites. Thank You for your time and consideration in the particular matter.

Sincerely,

Mr. Edward W. Maciejewski  
Mr. Edwards Maciejewski

Mrs. Theresa Maciejewski  
Mrs. Theresa Maciejewski

Mr. Mark Maciejewski  
Mr. Mark Maciejewski

Ms. Michele Maciejewski  
Ms. Michele Maciejewski

(see enclosed sheets for others whom disagree with your choice of dump site).....

Please refer to response to the Delaware Mobile Surf Fishermen

We, the following do agree with the Maciejewski family, & protest the dumping site of the Del. Bay &/or any of it's water ways:

Nancy Donchak  
 Corinne Ryan  
 Margaret Cunningham  
 Sandra Wilson  
 Robert Lee  
 Maria Lopez  
 Sheri Marx  
 Tracey A. Bergler  
 Cindy Hovine  
 Lawrence J. Johnson  
 Joan S. P. Jordan  
 Kathleen Heiges  
 Diane Anst  
 Jill Shideman  
 Carol Reber  
 Charlene Fingle  
 Jim Davis  
 Andy Puch  
 JOVANS  
 Althea Eisenhardt  
 Joan Fennell  
 John Hinkle  
 Emma Mae Spoklin  
 Lisa A. Haltski  
 Lois Brown  
 Earl Brenkle  
 Joanne Lukes  
 Joe Lukes  
 Markin Leppley  
 Dan Kennedy  
 Barry Montoya  
 Margaret Montoya  
 Jess Hartman  
 Freddy Harner  
 Dorothy M. Jenkins  
 Joyce M. Jenkins  
 Ann Leber  
 Chde W. Grace  
 Bernard M. Jenkins  
 Pat M. Jenkins  
 Marion Nichols  
 Rudy Raymond  
 Paul Raymond  
 Elsie Rylic  
 Barbara Hillier  
 Ruth E. Fry  
 Rose M. Brown  
 Susan Schaeffer  
 Patricia Hilgert  
 Joanne Sedicino  
 Christine Cronce  
 James J. Snyder  
 Edna Rose  
 Carl Rose  
 Shirley Weaver  
 Tine Glantz  
 Irene Gallash  
 Chet Ziemba  
 Janis Ziemba  
 Lester John, II  
 Lisa John  
 Megan John  
 Amy Wojtaske  
 Cindy Wojtaske  
 Elizabeth Wojtaske  
 Dave Camp  
 Marcella Camp  
 Leon M. Stork  
 Mike Chaseman

We, the following do agree with the Maciejewski family, & protest the dumping site of the Del. Bay &/or any of it's water ways:

Donald J. Racer David M. Wolgan

Joseph M. Cavanah Edward L. Miller

Benny J. Woodling Helen F. Miller

James A. Grice

John L. Grice

Scott M. Gruel

Elwood Truitt

John Reside

Amy Hoover

Michael Reller

James H. Bittling

Robert C. Haller

Beverly Haller

Kevin Mullen

Paula Hert

Pavel Babich

Bong Nef

Kenneth R. Eck

Michael A. C.

Harold Miller

John C. C.

5/1/97

DEAR MR. BRADY:

AS A LIFELONG RESIDENT, AS WELL AS AN AVID,  
CONSERVATION MINDED, CARING, SALT WATER SPORTS FISHER-  
MAN. I WOULD LIKE TO EXPRESS MY PROTEST  
CONCERNING THE DREDGING PROJECT OFF SLAUGHTER  
BROADKILL BEACHES, IN THE DEL. BAY.

I DO REALIZE THE IMPORTANCE OF SHIPPING IN  
THIS AREA, BUT YOU MUST UNDERSTAND THE RIGHTS  
AND OPINIONS OF US - THE RESIDENTS AND TAX-  
PAYERS OF THE STATE OF DELAWARE. TRUE, LARGE  
CORPORATIONS PROVIDE JOBS AND A LIVING US ALL -  
BUT, WE MUST ALL LAY ASIDE OUR GREED AND  
LURE OF THE DOLLAR, AND START CARING ABOUT TOMO-  
ROW, AND "OUR CHILDREN'S FUTURE".

IT IS CLEARLY VISIBLE, THAT THE PEOPLE RUNNING THIS  
PROJECT CARE, ONLY ABOUT THEIR OWN INTERESTS  
WITH LITTLE REGARD FOR WHAT LITTLE WILDLIFE/  
AQUATIC TREASURES WE HAVE IN DELAWARE.

ONCE AGAIN, FROM A SPORTFISHERMAN WHO HAS FISHED  
DEL. BAY WATERS FOR OVER 40 YEARS - STOP  
THESE PEOPLE FROM DESTROYING OUR STATE  
RESOURCES !!!

SINCERELY,  
SUE RALPH

Please refer to response to the Delaware Mobile Surf Fishermen.

JUNE 14, 1997

DEAR *Mr Brady,*

As a fisherman of forty plus years, I am concerned about the proposed Delaware River Main Channel Deepening Project.

After reading an article in the Fisherman magazine about the dredging and dumping in the Delaware Bay and what it would do in the future to The Coral Beds, I would like to voice my opposition to this project.

There is no doubt that this will have disastrous effects on the natural chain of animal life in the Bay, not only for the recreational fisherman, but for the commercial fisherman as well.

I am extremely opposed to this project and I believe that as necessary as the dredging of the canal is, it should continue in the trench off Cape May and not dump the sledge into the Bay. Please consider the surrounding environment and what it will do to our future. This project will result in the destruction of ecological stability.

I appreciate you taking the time to investigate and consider all alternatives and hope a satisfactory solution can be found for all involved and that the solution will be ecologically and economically sound.

Please preserve our future.

Sincerely

*Henry M. Parker*  
*18 E. Greenwing Dr.*  
*Milton, D.E., 19968*  
*PO Box 533*

Please refer to response to the Delaware Mobile Surf Fishermen.



To: Senator Joseph Biden Jr, Senator Wm Roth Jr, and Representative Michael Castle

From: Delaware Mobile Surf-Fisherman and concerned Citizens

Re: Delaware River Main Channel Deepening Project (Delaware, Pennsylvania, New Jersey)

Lead Agency: U.S. Army Corps of Engineers, District Philadelphia.  
Environmental Resources Branch (215) 656-6555

c/o John Brady  
U.S. Army Corps Engineer District  
100 Penn Square East  
Philadelphia, Pa 19107-3390

Honorable Sirs:

You are asked to investigate the above project and give consideration to our request.

We the undersigned request that any sand stockpiling related to dispersal of dredged material from the deepening of the Delaware River Main Channel not be dumped and stockpiled off of or near the water areas of Slaughter Beach and Broadkill Beach.

This area is know as "The Coral Beds." These beds are a primary feeding and spawning area for both fin fish and shell fish.

Our main concern is the adverse effect of the dumping of over 4 million cubic yards of sand/dredged material (according to the ACE) on approximately 750 acres off of these beaches. This material will smother all aquatic life on which fin fish and other aquatic life feed. Environmentally, this decision does not appear to be sound. In addition, this could seriously affect commercial and recreational fishing and other related business enterprises in the Lower Delaware Bay. Tourism could also be affected.

This material will also reduce the mean low water level of 8' to a mean low of 3' (according to ACE).

We would like to request a public hearing on this project so our questions and concerns can be addressed. The Biden Environmental Educational Center, Cape Henlopen State Park is a suggested location for this meeting.

Thank you for your attention to this matter.

Please refer to response given to Delaware Mobile Surf Fishermen to their letter dated March 16, 1997.

- 1 BIAZZO Giordano JR Rt1 B496 Delmar DE 19940  
William Arnold Rt3 Box 99 Millsboro DE 19966  
Ted Snyder JR Rt1 Box 239B Georgetown DE 19945  
Frank Wells RD1, Box 2537 Georgetown DE 19947  
Bill Wells RD3 Box 234 Millsboro 19966  
Don Roca 35575 Tingle Rd. Willkams, MD 21874  
Steve Bradford 35515 Tingle Rd. Willkams MD 21874  
Frank J Clark Rt. 1 24B Frankford, DE. 19945  
DAVID CLARK Rt1 24B Frankford DE 19945  
DAVID C BUNDICK Pres DAVIS PAINTING RD3 Box 381-D Millsboro  
Tom Dukes Rd1 Box 1824 Laurel DE  
Sharon DiTrani 1404 Eagles Landing Rehoboth, DE 19971  
Ray L. Zuber LAUREL DE 19916  
Phillip Lowe Georgetown DE 19947  
Rose Lowe Georgetown DE 19947  
Charles C. Thibault Millsboro DE 19966  
Denise E Evans Lewes DE 19958  
Ralph R. Lingo Greenboro DE 19966  
Michael Todd Laurel, DE 19956  
Kenneth Wescott Seaford DE 19973  
Buffy Hamaly Delmar DE 19940  
Em Busch Rt. 1 Box 446 Delmar DE 19940  
L. Hopkins 29193 P.O. Leiby Easton MD 21601  
George G. Adams AD1 Box 1180 Seabrook 19939  
Darryl C. Fisher Box 47 Possum Point Millsboro DE 19966  
John C. Lippitt RPR Box 529 D Millsboro DE 19966  
Jeff Baker 21 Ewing Dr Georgetown DE  
Stewart Medina R. 8 Box 901 Millsboro DE  
James S. Saker RD1 Box 276A Georgetown DE 19945  
Parish Alexander Route 3 B411 Millsboro DE  
H. H. Moseick Rt 2 Box 309 Millsboro DE

Daniel C. Morritt Rt 3 box 229-D Frankford DE

Paul Sady RD 2 Box 295R, Millsboro DE.

Steve D. Nite 110 Adams Ave, Lewes, DE 19456

Betsy 900 W 20<sup>th</sup> Wilmi DE

H. Mink 1910 Linden St Wilmi DE 19408-

Vern S. Hays RD 2 Box 300L Millsboro DE

Mark Faulkner 701 East St. Millsboro DE 19966

Mark Faulkner

Robert Cornell 95 Carey St Millsboro, DE 19966

Larry W. Zylko RD 2 BOX 300L MILLSBORO, DE 19966

Donald E. Wright 1805 Duncarton Pk Georgetown, DE 19947

Dwight A. RD 5 Box 125E-D Georgetown, DE 19947

Bill Dora RD 9 BOX 902 Millsboro DE

Allen Rogers RD 3 Box 192 Millsboro Del. 19966

Charles W. Kts BK 282 MILLSBORO DEL 19966

Ray E. Hays Rt 2 Box 325 Millsboro DE 19966

Ray E. Hays Rt 2 Box 325 Millsboro DE 19966

Frank Fuller RT 1 Box 190 D Laurel 19956

Jennifer Rowe RD 1 Box 755 Georgetown, DE 19947

Scott Rogers RD 3 Box 192 Millsboro, DE 19966

Thomas Zimmerman  
11 E. Edinburgh Dr  
New Castle, DE 19720  
Tel. (302) 328-1326

John Brady  
U.S. Army Corps of Engineers District  
100 Penn Square East  
Philadelphia, PA 19107-3390  
May 3, 1997

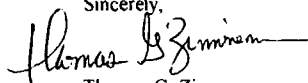
Dear Mr. Brady,

After reading the April 3, 1997 issue of *The Fisherman*, I felt obliged to express my concerns about the proposed Delaware River Main Channel Deepening Project. As an avid recreational surf fisherman I am concerned about the effect the dredging will have on the "The Coral Beds" and the surrounding environment. There is no doubt that this will have disastrous consequences on the natural chain of animal life in the Bay, but it could also have substantial economical significance for commercial fishermen.

I am extremely opposed to this project and I believe that while maintenance dredging may be necessary, it should continue in the trench off of Cape May. Unfortunately, I feel that too often there is little thought given to the long term effects of our present actions. This project will result in the destruction of ecological stability because we insist on looting the future for the sake of present convenience.

I appreciate you taking the time to investigate other alternatives and look forward to a satisfactory solution for everyone involved. I trust that the solution will be an ecologically and economically wise decision.

Sincerely,

  
Thomas G. Zimmerman

cc: Senator Joe Biden  
Senator Bill Roth  
Congressman Michael Castle  
*The Fisherman*

Please refer to response to the Delaware Mobile Surf Fishermen.

Dear Sir

Just a note to let you know I do  
not think Slaughter on Broadkill Beach  
is the place to pump dredging material  
why not use area off Cape May, in  
Trench you have used before?

If you use area off Slaughter's beach  
it will kill all sea life there.

*Thank you  
A.L. Wright*

A.L. Wright  
4311 Vernon Road  
Harrington, DE 19952

Please refer to response to the Delaware Mobile Surf Fishermen.

April 29, 1997

Dear Mr. Brady

As a longtime Delaware resident and an avid Delaware Bay recreational fisherman, I find the proposal for the dumping of the Delaware River and Bay dredging spoils into the area known as the "Coral Beds" totally unacceptable!

Frankly, I don't know how the Delaware officials who are in charge of protecting our natural resources, could even consider this area as a viable dumping site.

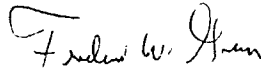
This area is historically a prolific breeding ground and harbor of refuge for every species of fish and shellfish that inhabits the Delaware Bay.

Not only would this function, as it now exists, be virtually brought to an end, but the contaminants in the spoils, ( such as PCB's ), would be distributed throughout the entire Bay.

I think I can speak for other Delaware Bay fishermen when I say that we have no intention of allowing this atrocity to take place!

Please give this matter your utmost attention.

Sincerely,



cc:

K. Kaufman  
J. Brady  
Gov. Carper  
Sen. Roth  
Sen. Biden  
Con. Castle

Please refer to response to the Delaware Mobile Surf Fishermen.

June 21, 1997

13 Lawndale Ave.  
Morristown, NJ 07960-3512

Robert L. Callegari  
U.S. Army Corps of Engineers  
Philadelphia District  
100 Penn Square East  
Philadelphia, PA 19107-3390

Re: Pea Patch Island, Delaware River

Dear Mr. Callegari,

Regarding the above referenced subject, what is the status of including Pea Patch Island in a revision of your January 1997 released Environmental Impact Statement on dredging of the Delaware River? My understanding is that the Corps of Engineers is also responsible for a seawall on the southeast corner of the island which was damaged by a storm in the 1960s has caused continuous erosion on the island. Can this be repaired as part of the Delaware dredging project?

It is understood that the Delaware River dredging is important to the economy of the Delaware Valley. Fort Delaware and Pea Patch Island are a proud heritage of the Delaware Valley Region as well as a wonderful natural wildlife area. Consideration, in my opinion, should be given to these historic and natural resources.

Your earliest response is appreciated.

Sincerely,



Michael Pietsch

Please refer to response to Delaware Parks and Recreation Council.

6.12.77

FREDERICK A. MOSSEMER  
Sons of Union Veterans  
Col. Louis R. Francine  
Camp #7  
Hammononton, NJ

Dear Mr. Calligari:

Greetings! I hope this letter finds you in excellent health. Mr. Calligari, I have a few concerns about the channel deepening project of the Delaware River. My main concern is the impact such a project would have on the Fort Delaware. I am acquainted with people who had relatives die while serving as POW's during the Civil War there and the ramifications of this project's effect on Pea Patch Island is more than disconcerting to them. As a preservationist, I'm alarmed at what could happen to a valuable part of our history!

At the risk of sounding critical (and I do not mean to), could you include Pea Patch Island in your E.I.S.? Would the Army Corps of Engineers consider repairing and/or restoring the seawall?

Thank you for your kind attention, Mr. Calligari. I hope a viable solution for all concerned may be found.

Respectfully yours,  
F. A. Mossemer

Please refer to response to Delaware Parks and Recreation Council.



## ALERT

Fort Delaware survival threatened  
by government river-deepening proposal

**PEA PATCH ISLAND, DELAWARE RIVER**--A recent channel dredging proposal by the U.S. Army Corps of Engineers will sound the death-knell of Pea Patch Island --and Fort Delaware--according to Fort Delaware Society Chairman William E. Craven, and the Corps does not appear to be listening.

In January, 1997, the Philadelphia District, Corps of Engineers, released an Environmental Impact Study (EIS) favorable to a Corps proposal to dredge and deepen the main shipping channel of the Delaware River, to allow larger ships to reach the ports of Wilmington and Philadelphia. The proposal never addressed the environmental impact on Pea Patch Island and Fort Delaware, which lie just a few hundred yards from the channel and are suffering serious shore erosion from ship wakes. According to Craven, the Society, though in constant contact with the Corps about the Island's erosion problems, was never notified of the EIS, to give them time to comment. No public hearings were held.

In the 1960's a riprap seawall on the southeast corner, the only part of the Island still "owned" by the Corps of Engineers, was breached by a storm, allowing for a 30-year process of erosion to begin. According to Craven, the Society and the State of Delaware have been asking the Corps to repair or replace the wall ever since. But in spite of acknowledging the problem and it's solution, the Corps has refused to do anything. Subsequent ship wakes and storms have eroded the shore so severely as to destroy several artifact sites and now threaten to eat away the island until the Fort itself is exposed.

"The total loss of artifacts known to be in the eroded area is unknown," Craven remarked in a recent letter to Robert L. Callegari of the Corps' Philadelphia District. "We do know that a searchlight base has been destroyed, and a building site, believed to be a blacksmith shop, has also been destroyed."

Craven asked Callegari to not close the EIS, but expand it to include Pea Patch Island, Fort Delaware, and the Island's heronry at the opposite end, the largest such heronry north of Florida, which would also be threatened. He also called upon the Corps to repair/restore the seawall, which should prevent further problems.

### WILL YOU HELP?

Call or write your **Senator** or **Congressman** and ask him/her to help force the Corps of Engineers to do the right thing:

- include Pea Patch Island in their Environmental Impact Study
- repair/restore the seawall

Then write to **Robert L. Callegari** and tell him the same thing. The address is U.S. Army Corps of Engineers, Philadelphia District, 100 Penn Square East, Philadelphia, PA 19107-3390. For further information call the Society at (302)834-1630.

Mr. ROBERT L. CALLEGARI 1304 RADFORD RD.  
CHIEF, PLANNING DIVISION WILMINGTON, DE 19803  
U.S. ARMY CORPS OF ENGINEERS JAN. 30, 1997  
PHILADELPHIA DISTRICT COPY TO REP.  
ENVIRONMENTAL RESOURCES BRANCH JANE MARONEY,  
WANAMAKER BUILDING DELAWARE  
100 PENN SQUARE EAST LEGISLATURE  
PHILADELPHIA, PENNSYLVANIA 19107-3390

DEAR Mr. CALLEGARI;

THANK YOU FOR SENDING ME THE DRAFT OF THE DELAWARE RIVER MAIN CHANNEL DEEPENING PROJECT. IN VIEW OF YOUR REQUEST FOR COMMENTS BY FEB. 17, 1997 I MADE SEVERAL VISITS TODAY AND HAVE THESE COMMENTS:

1. THE 1997 DELAWARE FISHING GUIDE SEVERELY LIMITS FISH CONSUMPTION DUE TO PCBs, ETC. AS I UNDERSTAND YOUR REPEAT DREDGING CAN REDUCE PCB CONTAMINATION.
2. THE KALMAR NYCKEL SHIP BEING BUILT WILL DRAW 12 1/2 FEET. HER BUILDER, ALAN RAWL, ENDORSES DREDGING, THE SOONER THE BETTER.
3. THE TOW BOAT AT DELAWARE CITY MARINA, OUT OF WATER FOR SEVERE PROPELLOR DAMAGES LOOKED LIKE A SEA MONSTER HAD CHOMED UP THE PROPELLOR BLADES. A WORKER THERE SAID THEY BREAK UP ICE FOR BOATS AND MAKE RESCUES OFF ROCKS, AND FAVORS DREDGING.
4. I BUILT A SAILING SKIFF AND ONE MAN DINGHY LAST YEAR WITH MORE FREEBOARD TO REPLACE 2 KAYAKS, A ROWBOAT AND A SUNFISH SAILBOAT. FOR LARGER WAVES EXPECTED FROM SHIPS. THE SKIFF WITHOUT 4 LEE BOARDS, SAILED IN VERY SHALLOW WATER AND THE DINGHY ROWED WELL. TOWARDS IMPROVEMENT IN DESIGN IS MORE VEE BOTTOM AND DOUBLE END HULL, BUT IN PLYWOOD, FOLLOWING SOME PRECEDENT IN DELAWARE DUCKER "LAP STRAKE" BOATS ONCE USED FOR SAFETY IN HUNTING, BUT TO HELP KEEP WIND IN THE SAIL.

5. I VISITED CONGRESSMAN MICHAEL N. CASTLE'S OFFICE IN WILMINGTON, DELAWARE AND TALKED WITH HIS PRESS SECRETARY, CHRISTINE NOLT, ENDORSING DREDGING AND SUGGESTING 2 IDEAS:

A. THAT SHIPS TRAVELING THE CHANNEL BE EQUIPPED WITH DOWNWASH PLATES TO HELP KEEP THE CHANNEL CLEAN BETWEEN DREDGINGS. I LEARNED OF THESE FROM THE ATOCHA EXHIBIT OF THE TREASURE HUNTER, MR. FISHER AT THE DELTECH CAMPUS, RT. 18, GEORGETOWN, DELAWARE, WHO MODIFIED MISSISSIPPI RIVER TUG BOATS TO DIRECT PROP WASH DOWNWARD AND REMOVE SEDIMENTS STORM LAID ON THE ATOCHA WRECK IN THE GULF OF MEXICO.

B. THAT ALL VEHICLES TRAVELING ROADS BE EQUIPPED WITH VACUUM CLEANERS TO CLEAN UP ROADS. EVERY BIT COUNTS. MS. NOLT ASKED WHAT ABOUT GETTING AID OF THE DIRT? I SUGGESTED YOU HAVE FOUND SUITABLE DISPOSAL SITES.

JAN. 31, 1997

6. READING THE DELAWARE STATE NEWS 1/30/97 OF A PROPOSAL TO TAX BEACH AREAS FOR COSTS OF BEACH REPLENISHMENT, I TURNED TO STEVE NESTYBA'S OCEANOGRAPHY TEXT, PUZZLED, FOR EXAMPLE, THAT ASSATEAGE, IS. BEACH BUILDS UP & BETHANY'S NEEDS REPLENISHMENT.

- 3 -

THE EXPLANATION OF LITTORAL TRANSPORT OF WAVES WASH UP AT ANGLES YET RUNOFF IS STRAIGHT WOULD ALSO APPLY, I THINK, TO THE AIR FLOWS ALONG THE COAST. THE ISLANDS LOW LONG AND SLOPING WHILE BUILT UP BEACHES ARE LIKE WIND SWEEP CITY STREETS.

IT SEEMS CLEAR MUCH TRANSPORT IS ALSO CAUSED BY WINDS. THAT IS TO SAY WITH SUFFICIENT FLOW AREA OVER LOW & WIDE BEACH & MARSH & VEGETATION WIND VELOCITIES WOULD BE GENERALLY TOO LOW TO MOVE SAND. SO THEN THE PROPER AERODYNAMIC DESIGN OF STRUCTURES AT THE BEACH COULD HELP REDUCE THE LOSS OF SAND.

IT IS SAID STORMS BREAKING RESULT IN SHOALS FORM OFFSHORE. ONCE AGAIN A SHALLOW SLOPE IS MUCH LESS LIKELY TO BREAK UP AND MUCH MORE LIKELY TO CARRY SAND FURTHER IN THAN STEEPER SHORES.

I HAVE NOTICED IN FLORIDA THAT BEACHES NOT CLEANED BY MUNICIPAL WORKERS ARE FULL OF DRIFTWOOD, ETC. AND ARE MUCH WIDER BEACHES AS WELL AS WHERE TURTLES LAY EGGS. (DEL RAY BEACH & ENVIRONS) LIKELY TEST MATTS OF PLENTIFUL PHACELITES COULD DO A SIMILAR RETENTION JOB IN DELAWARE. AT THE OUTER BANKS FISHING IS ENHANCED BY HAVING SHOALS

CHESAPEAKE BAY  
MAGAZINE  
DEC. 1994

OFF SHORE, WITH THE LAGOONS & CHANNELS IN BETWEEN.

7. IN READING ABOUT CHESAPEAKE BAY, SILT FROM HURRICANE AGNES REDUCED THE UNDERWATER PLANT LIFE & CANVASBACK DUCKS DECLINED, AS DID ROCK. THE DUCKS HAD TO CHANGE THEIR DIET & BECAME DEPENDENT ON CORN, ALSO. YET A BOOK BY DR. BARRY SEARS "THE ZONE" SUGGESTS THERE IS MORE TO IT THAN THAT, FOR MAN & DUCK ALIKE. FOR CANVASBACK DUCKS DIET USED TO BE 80% PLANT & 20% ANIMAL MATERIAL, BUT (DEC. 1994) 80% ANIMAL, CHIEFLY CLAMS & 20% PLANT. (MACOMA BALTHICA) BUDS OF HYDILLA & CORN FED BY WATER FRONT OWNERS. THE AUTHOR, JOHN PAUL WILLIAMS SAYS THEY EAT 2 TO 3 TIMES THEIR WEIGHT IN SOFTSHELL CLAMS EACH DAY, GIVING ENOUGH PROTEIN, BUT NOT ENOUGH FUEL TO KEEP BODY WEIGHTS UP. DR. SEARS SAYS PEOPLE ON THE HIGH CARBOHYDRATE DIET TEND TO BE TOO FAT, AND THAT THERE IS A PROPER BALANCE BETWEEN PROTEINS AND CARBOHYDRATES AND EXERCISE. HIS FINDINGS PRODUCED RECORD-BREAKING SWIMMERS. CLEARLY THEY APPLY TO CANVASBACK DUCK POPULATIONS, TOO, WHERE SURVIVAL OF THE FITTEST WOULD BE RELATED TO NUMBERS THAT SURVIVE.

I GUESS NO ONE TOLD THE DUCKS THEY COULDN'T EAT THE SHELLFISH. THEY HAD TO LEARN THE HARD WAY. NOW WE'VE BEEN TOLD NOT TO EAT THE FISH, WHAT DOES THAT HARD WAY MEAN TO US?

DR. BARRY SEARS TALKS OF A BALANCE OF GLA, GAMMA LINOLENIC ACID, WITH EPA, EICOSAPENTAENOIC ACID, TO STAY IN THE "ZONE". GLA IS MADE BY THE BODY, EXCEPT AT BIRTH WHEN MOTHER'S MILK FURNISHES IT AND LATER IN LIFE <sup>DIMINISHED</sup> WHEN <sup>3 TO 5</sup> BOWLS OF COOKED OATMEAL <sup>HELP</sup> SUPPLY IT. (DR. SEARS RELATES HOW HE TRIED TO CORNER THE MARKET ON GLA BY EXTRACTING IT FROM BORAGE<sup>IN</sup> WHICH IT ACTS AS A SEED "ANTI-FREEZE" IN SASKATCHEWAN & NEW ZEALAND.)

MACKEREL, SALMON & SHADINES ARE LISTED AS RICH SOURCES OF EPA.

HAVING TO TAKE ZOCOR<sup>®</sup> FOR REDUCTION IN CHOLESTEROL, I WAS VERY INTERESTED IN DR. SEARS RELATE THE ACCOUNT OF A MAN TAKING SUCH MEDICINE ADOPT HIS RECOMMENDATIONS WAS ABLE TO LOWER CHOLESTEROL AND STOP TAKING THE MEDICINE & GOT HIS WEIGHT UNDER CONTROL.

BIOASSAYS RUN ON THE ESTUARY NEED TO CONSIDER THESE FACTORS TOWARDS FIGHTING THE

#1 KILLER OF PEOPLE, HEART DISEASE. BUT BIOASSAYS ALONE CAN'T DO IT. SINCE EXERCISE IS INVOLVED LIFE STYLES THAT ALLOW THAT ARE ESSENTIAL. FOR A SOCIETY HIGHLY DEPENDENT ON USING FUELS FOR TRANSPORT & HEAT & WORK, THE THERMOSTAT IS SET OVER NARROW LIMITS, SO THAT WE GET INTO TROUBLE OUT OF SUCH LIMITS, OBSTRUCTIONS IN HIGHWAYS, ARTERIES OR SHIP CHANNELS BRING MAJOR CONSEQUENCES, TAKING LONG TIMES IN RECOVERY AS NEW CHANNELS ARE BUILT, GROWN, OR DUG.

a. DNA RESEARCH SHOULD CONTINUE SO AS TO EXPLAIN HOPEFULLY INDIVIDUAL DIFFERENCES AND SUSCEPTIBILITY TO DISEASES AND ACCIDENTS OR OBSTRUCTIONS. THERE IS EVERY INDICATION THAT CLEAR THINKING ITSELF IS DEPENDENT UPON STAYING IN THE "ZONE". SO THEN UTILIZING PROPER BODY FUELS AND PROTEINS AND EXERCISE MAY BECOME THE MAIN WEAPON AGAINST CRIME AND ITS HIGH COST TO GOVERNMENT AND SOCIETY. DR. SEARS SAYS THE BRAIN IS COMPOSED OF FATTY TISSUE. STAYING IN THE "ZONE"

(HIGHLY COMPETITIVE SWIMMERS)  
SAY IT IS A MIND  
GAME.

- 7 -

MEANS FAT MAY BE UTILIZED, GIVING TWENTY TIMES MORE ENERGY THAN THAT WHICH THE BODY CAN STORE AS CARBOHYDRATE. THE ROLE OF BROADER INTERMITTENT-STATIC CAPABILITY IS OBVIOUS IN MORE ENERGY UTILIZATION. CLEARLY IF IN FORMATIVE YEARS A BODY IS NOT TESTED SUCH MEANS MAY NEVER DEVELOP.

B. SINCE RECOVERY FROM INJURIES CAN BE VERY RAPID FOR OLD PEOPLE, BONES KNIT MORE QUICKLY MY DOCTOR SAID THAN YOUNGER PEOPLE WHERE MORE NEW BLOOD VESSELS MUST FIND THEIR WAY, THEN MATTERS OF AGE BIAS NEED TO BE REPLACED BY INDIVIDUAL FREEDOM FOR BETTER ATTENTION.

AS A PLANNER, I KNOW YOU ARE LOOKING FOR CREATIVE WAYS TO SOLVE PROBLEMS. MY EXPERIENCE IN RESEARCH AND DEVELOPMENT IN INDUSTRY WAS JUST ONE IDEA WAS OFTEN NOT ENOUGH. SOMEHOW IT WOULD TAKE ABOUT 19 IDEAS ON A PARTICULAR

(AS A SUBSTITUTE TEACHER I FOUND STUDENTS NEEDED A LOT OF PERSUASION TO DO THEIR WORK. SUCH MATTERS WERE MUCH UNDER STUDY BY TEACHERS WHEN I GOT MY MASTERS IN OCCUPATIONAL EDUCATION.)

- 8 -

PROBLEM TO ENCOURAGE GOING AHEAD AND TRY OUT TO SEE WHAT WORKS. I UNDERSTAND NOW THAT THIS 19 IDEAS + 1 PROBLEM AMOUNT SEEMS MORE RELATED TO DR. SEARS COMPARISON TO THE ENERGY FROM FAT THAN THE ENERGY FROM A CARBOHYDRATE.

SO IT IS THAT YOU MAY NEED MORE MOTIVATION THAN JUST MY LETTER TO CONFRONT SINGLE-MINDED OFFICIALS.

ABOUT THAT I HAVE TWO THINGS TO SAY, SINCE THE PRESIDENTS ARE TO COME TO ENCOURAGE VOLUNTEERS THIS SPRING IN PHILADELPHIA, AND MY EXPERIENCE AS A VOLUNTEER LEADS TO TWO EFFECTIVE SUGGESTIONS:

1. FIND OUT BEFORE HAND THE TASK TO BE DONE.

2. TAKE YOUR OWN TOOLS.

AND INDEED I HOPE YOU ASK FOR VOLUNTEERS. IT OCCURS TO ME THAT YOUR METHOD OF DREDGING IN CONJUNCTION WITH PRESSURE NOSES COULD BE

(IN ESSENCE, HERE TECHNICAL ATTRIBUTES ARE LATE TO A PERSON.)

USED AT LOCAL SITES OF PCB CONTAMINATION & THE SPOILS DEPOSITED AT YOUR DISPOSAL SITES.

FROM WHAT I'VE READ OF LEAD RESIDUES CLEANED UP FROM A SHIPYARD SITE, MUCH HAND WORK, RAKING, INVOLVED, SIMILAR TO THE TREASURE HUNTERS USING SUCTION NOZZLES TO REMOVE SEDIMENTS, OR LEAVES RAKED INTO A VACUUM PICKUP.

I REALIZE ITS NOT ALL THAT SIMPLE, BUT I HAVE SHOVELS & RAKES AND AM WILLING TO HELP VOLUNTEER. NOW MR. CALLEGARI I END THIS 2 DAY LETTER TO GO FOR A REGULAR SWIM AT THE YMCA POOL. I WEAR RX GOGGLE AND ON TRIPS SWIM AT MANY OF THE U.S. ARMY CORPS OF ENGINEERS SITES WHERE I CAN SEE OR TOUCH BOTTOM AND WISH TO CONVEY MY THANKS FOR THEIR LEADERSHIP IN THESE MATTERS AND INTEREST AND ACTIONS IN OVERCOMING PROBLEMS. SO I HAVE NO COMPUCTIONS TO RAKE, DIG OR SWIM TO WALKING DEPTHS

AND RETAIN MY ACTIVE 1<sup>ST</sup> AID, CPR LIFE SAVING & BOATING COURSE CERTIFICATIONS AS WELL AS A CONTINUING HOBBY IN BUILDING BOATS THAT I DESIGN. IT IS NOT MY INTENTION TO OBSTRUCT THE SHIP CHANNEL. I LEARNED EARLY IN ROWING ACROSS THE DELAWARE THAT IF A MOVING SHIP WAS IN SIGHT TO WAIT UNTIL IT PASSED BEFORE CROSSING THE SHIPPING LANE.

HAVING OBSERVED THE LAST MAJOR OIL SPILL AND ATTENDED THE COAST GUARD INQUIRY HEARING OF THE SLITS IN THE HULL MADE BY THE SIDES OF THE CHANNEL NEAR HERE AS THE SHIP SWUNG AROUND AND HIGH PRESSURE GAS FORCED OIL OUT THAT THEN COAGULATED IN CLUMPS I STAND READY TO ASSIST WITH MY BOATS SHOULD SUCH A MISHAP RE-OCCUR. I DON'T LIKE GETTING MY BOATS MESSED UP BY OIL, LIKE MY ROWBOAT USED TO HAVE A BLACKENED WATER LINE FROM BILGES DUMPED THEM AS DID THE SHORE. NOW THAT HAS

- 11 -

CHANGED FOR THE BETTER &  
I DO NOT FEAR THE CHANNEL  
WIDENING NOR SHIPS DESIGNED  
BIGGER & MORE CAPACITY. BUT  
IF I REPLACE MY LEEBOARDS  
WITH WHEELS TO ASSIST  
GETTING MY BOAT FROM WATERS  
EDGE TO CATOP I THINK  
IT BEHOVES SHIP DESIGNERS  
TO PUT ROLLER TYPE FENDERS  
WITH BACKUP PLATES SPREAD  
THE LOAD BETWEEN BULKHEAD  
SUPPORTS ALONG THE SIDES  
OF SHIPS IN DANGER WITH  
PRESENT CHANNELS, SO AS  
NOT TO GET SLIT BY ROCK.

ALTERNATIVELY WOULD BE  
TO LINE THE SHIP SIDE WITH  
SKIIS UNDER WATER. THEIR  
TOUGH PLASTIC CAN TAKE  
ROCK GOUGES WITH REDUCED  
WEAR, ALSO. I BELIEVE THE  
PLASTIC USED IS LINEAR  
POLYETHYLENE TO HANDLE ROCK.

GOOD LUCK!  
THANK YOU!

SINCERELY,  
James R. Hodges

AND BY  
HODGES INC.

AS I  
DO.

- 12 -

POST SCRIPT:

ANY ESTIMATE IS INCOMPLETE WITHOUT  
SOME MEASURE OF NUMBERS. DELAWARE  
IS NOTABLE FOR ITS INVENTIONS, BUT  
MANY INVENTIONS PROVE IMPRACTICAL FOR  
ONE REASON OR ANOTHER. IF INDEED  
TO USE DUE DILIGENCE OF SOME 19  
PROBLEMS TO REPLICATE A PROCESS  
OF TRYING OUT IDEAS, THE "WORK"  
WOULD BE  $(1+19)(19) = 380$  TIMES,  
FOR CAPITAL ITEMS, ONCE IN 380  
YEARS.

1997  
- 380

1617 IS BEFORE THE SWEDES  
1638 SETTLED IN WILMINGTON. JOHN A.  
MUNROE'S HISTORY OF DELAWARE DATES  
HENRY HUDSON'S DISCOVERY 1609  
SAMUEL ARGALL'S TAKING  
REFUGE FROM A STORM 1607  
AND A WALLOON SETTLEMENT ON  
BURLINGTON ISLAND 1624  
& ABANDONED  
SWANENDAM 1631  
& NEW CASTLE 1651.

PROF. MUNROE GIVES AS THE REASON  
OF DIFFICULTY WITH INDIANS AT  
SWANENDAM A METAL COAT OF ARMS STOLEN  
FROM THE DUTCH WHO COMPLAINED & THE  
INDIANS KILLED THE THIEF, BUT FRIENDS  
RETRALIATED AGAINST THE DUTCH FOR THE  
INSULT. INDIANS LIVED IN A STONE AGE  
CULTURE & METAL NEW TO THEM. I'VE READ  
OTHER DIFFICULTIES EVIDENTLY WITH ALCOHOL,  
SOCIAL CUSTOMS AND DISEASES FOR WHICH  
THEY HAD NO IMMUNIZATIONS.

IF WE ASSUME THAT DA. SEARS THESIS APPLIES, ONE MIGHT EXPECT THE INDIAN DIET OF FISH, SHELLFISH & CORN WHICH IS SIMILAR TO CANVASSBACK DUCKS POTENTIALLY AT FAULT, AS WELL AS THE DIET OF SAILORS AT SUCH TIMES, A LITTLE MEAT, FISH MOSTLY BISCUIT & RARE FRUIT. COMPLICATING THE PROBLEMS WOULD BE AN ENERGY LIMITATION FOR THE SAILORS ON HIGH CARBOHYDRATE DIET COMPARED TO SKINNY INDIANS ON HIGHER PROTEIN DIET.

SO THE DIFFICULTY WAS OVER STEERING TOOLS.

PERHAPS THERE WAS ALSO DIFFICULTY IN FINDING OUT BEFORE HAND WHAT WORK ONE MIGHT VOLUNTEER FOR SO ONE COULD BRING TOOLS TO FIT THE TASK.

LACKING THEN THE TWO CRITERIA FOR VOLUNTEERING, THE RESULT IS COMPUSSION ON ONE HAND OR THE OTHER BETWEEN TWO GROUPS WHICH FOR VARIOUS DEFICIENCIES HAD TO ACT IN GROUP FASHION.

WHAT LESSONS DOES THIS HISTORY HAVE FOR US TODAY?

WE HAVE A GOVERNMENT THAT WILL NOT RECOGNIZE INDIVIDUAL PROBLEMS UNLESS THEY ARE OF A GROUP. FOR EXAMPLE, IN THE DELAWARE STATE NEWS THE FLIGHT OF FARMERS HAVING TO PAY HIGH INHERITANCE TAXES TO KEEP FARMING

FALLS TO OUR CONGRESSMAN'S PLEA TO BALANCE BUDGETS. IN SPITE OF MUCH EFFORT, MORE & MORE FARMLAND GOES INTO HOMESITES & DESCENDANTS OF FARMERS PAY TAXES INSTEAD OF TUITIONS.

THE OATH OF OFFICE THE GOVERNOR TAKES FOR PRESERVATION FOR FUTURE GENERATIONS IS NOT MATCHED BY A SIMILAR PRESIDENTIAL OR CONGRESSIONAL OATH.

SO IN SOUTHERN ILLINOIS I READ FARMERS FILLING IN POTHOLES STOLE NESTING SITES THAT HAD SOME PROTECTION AGAINST PREDATORS FROM CANVASSBACK DUCKS.

THE DUTCH INTENT ON TRADE OCCUPIED GLOUCHESTER, N.J. WAS THAT A FACTOR IN WALLOONS LOSS OF SETTLEMENT? CLEARLY THE BATTLE BETWEEN WALLS & SETTLEMENTS SWEEPS THE COUNTRY EVEN TODAY, THE MODIFICATION OF A WALL IN HOUSTON KILLING CUSTOMERS THERE AS IT COLLAPSED ON OPENING PER TV.

THE CORPS OF ENGINEERS HAS VIEWED HISTORICAL MATTERS ON A BASIS OF STATISTICAL RE-OCCURANCE WITH 100 YEARS AN APPROXIMATE VALUE ASSOCIATED WITH FLOODING.



THE ASSUMPTION OF A SINGLE PARAMETER MAY CHEAT THE OPPORTUNITY OF RISING TO THE OCCASION TO MEET CRISIS.

IF 100 YEARS CORRESPONDS TO CROPS I.E. CARBOHYDRATES OR EVEN TO PROTEINS, SUCH AS AVAILABILITY OF FISH & GAME & HERDS THEN THE RELATION BETWEEN ENERGY FROM FAT & ENERGY FROM CARBOHYDRATES WOULD BE OF THE ORDER OF 10/1, INSTEAD OF 20/1, FROM BOTH PROTEIN & CARBOHYDRATE ENDANGERED. TITHES OF 1/10 WERE EXACTED BY THE MONGOLS IN CONQUEST TRIBUTES, FOR EXAMPLE

WOULD THEN CALAMITIES OF 100 YEARS ACTUALLY BE OF THE ORDER OF  $10(100) = 1000$  YEAR OCCURRENCE, SOMETHING TO WORRY ABOUT?

OUR GOVERNMENT IS SEEKING TO ADJUST THE CONSUMER PRICE INDEX TO REALITY OF 1.1% LESS. AS A SOCIAL SECURITY RECIPIENT THAT IS A 1.1% PAY CUT. FOR GOVERNMENT CONTRACTS TIED TO INFLATION IT MAY ALSO REPRESENT A PAY CUT.

NEVERTHELESS, IN ORDER TO SAVE TO MEET CALAMITIES, SUCH CUTS IN PAY SEEM APPROPRIATE, NOT JUST TO HELP OURSELVES, BUT ALSO OTHERS TO WHOM WE MAY ASSIST IN CALAMITIES.

HOW THEN MAY THIS BE ACHIEVED? VOLUNTEER EFFORTS OF 1.1%/YEAR, DOUBLED TO ACCOUNT FOR DUTY ARE APPROXIMATELY  
 $(.022)(2000 \text{ HOURS/YEAR})$   
 $= 44 \text{ HOURS/YEAR}$ .

I NOTE THIS APPROXIMATES THE WEEK OR SO NATIONAL GUARD & OTHER RESERVES TRAIN. THAT SEEMS BUT ONE OPPORTUNITY.

HOW MANY OTHERS MIGHT THERE BE? LIKELY BETWEEN

$\frac{1}{.011}$  AND  $\frac{1}{.022}$ , OR

91 AND 46. THE DIFFICULTY, IN PREPAREDNESS IN KNOWING WHAT OCCUPATIONS MAY BE NEEDED. THE DEPT. OF LABOR HAS SOME 40,320 OCCUPATION TYPES AND THE

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CURRENTLY PROPOSED HEAD IS UNDER INVESTIGATION IN REGARD TO CONNECTIONS WITH THE PRESIDENT'S CAMPAIGN.

FITTINGLY ENOUGH, OF 8 QUESTIONS I.E. IF? WHO? HOW? WHY? WHEN? WHERE? WHICH? & WHAT? THE NUMBER OF DIFFERENT ARRANGEMENTS ARE  $8! = 40,320$ .

SO THE CHANCES OF BEING CALLED TO VOLUNTEER IN  $91+1$  &  $46+1$  DIFFERENT WAYS ARE

$$\frac{92}{40,320} \quad \text{AND} \quad \frac{47}{40,320}$$

$$= .00228 \quad \text{AND} \quad .00116$$

ASKING ASSISTANCE OF ONE SERVING 44 HOURS/YEAR AT SUCH RATES IS SUCH A PERSON LEAD BETWEEN

$$\frac{1}{.00228} \quad \& \quad \frac{1}{.00116}$$

$$= 439 \quad \& \quad 862 \text{ VOLUNTEERS.}$$

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THE SIZE OF SUCH LEADERSHIP WOULD BE THEN

$$\frac{40,320}{439} \quad \text{TO} \quad \frac{40,320}{862}$$

$$= 92 \quad \text{TO} \quad 47 \text{ PEOPLE.}$$

THIS IS APPROXIMATELY THE SIZE OF THE ORGANIZATIONS IN RELIEF OF HURRICANE AGNES THAT I PARTICIPATED IN. WHILE I HAVE NOTED THE RUNOFF, THERE WERE TWO LEVEES SCoured OUT, & BURST, ONE IN WILKES-BARRE & THE OTHER IN KINGSTON, PA. I AM GLAD THAT WHEN THE BRIDGE WAS THREATENED RECENTLY YOUNG PEOPLE VOLUNTEERED TO SAND BAG IT.

I UNDERSTAND YOU HAVE AT YOUR DISPOSAL OTHER ASSESSMENTS OF RESPONSES TO DISASTERS FROM A GROUP AT THE UNIV. OF DELAWARE. I HAVE NOT SOUGHT THEIR EVALUATIONS AS I AM CONTENT TO VOLUNTEER WHERE I MAY BE OF ASSISTANCE, AND I

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HOPE THIS LETTER HELPS BY WAY OF ITS MORE OR LESS INDEPENDENT VIEW.

I AM PUZZLED THE STATE OF DELAWARE WOULD PUT OUT A FISHING GUIDE WITHOUT SOME INFORMATION ON THE NUTRIENTS OF VARIOUS SPECIES.

I AM STILL PUZZLED THAT WE EVIDENTLY DON'T KNOW ENOUGH ABOUT METABOLISM TO DETECT BUT A FEW CANCER SITES BY MODERN DIAGNOSTIC MEANS. DR. FAELICH, WHO TRIES TO TRACK MATTERS DOWN LOOKS FORWARD TO RESULTS FROM DNA MAPPING TO EXPLAIN WHY ONE PERSON WHO SMOKES MAY GET CANCER AND ANOTHER NOT.

THIS LETTER THEN IS SENT IN IGNORANCE, AND IF I, A TEACHER DOESN'T KNOW, CAN I EXPECT MORE OF STUDENTS? WELL, YES, BY WAY OF ENCOURAGEMENT, WITHIN BUDGET AND WITH AWARENESS OF OPPORTUNITY TO VOLUNTEER AND WITHOUT GIVING UP ON FUTURE GENERATIONS.. THANK YOU.

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I AM SENDING A COPY OF THIS LETTER TO REP. JANE MARONEY DELAWARE LEGISLATURE, WHO HAS LONG BEEN ACTIVE IN MATTERS OF CONCERN ABOUT FAMILIES & SOCIAL ISSUES, WHICH INDEED ARE ENVIRONMENTAL ISSUES. FOR MANY YEARS INFANT MORTALITY RATES HIGH IN DELAWARE & NOT ALL THE REASONS YET KNOWN.

OUT OF CONCERN FOR SOME NEIGHBOR'S CHILDREN CRAWLING UNDER A CAR TO RETRIEVE A BALL I HELD BACK OF THE LEASH OF OUR LATE GERMAN SHEPHERD & HIS PULL CAUSED ME TO SLIDE ON THE MUDDY SIDEWALK & BREAK A LEG ON AN OUT CROP. I NEEDN'T HAVE BEEN CONCERNED AS HE WAS FRIENDLY WITH CHILDREN. BUT I CALCULATED MY FEET WERE MOVING 18 MPH AT IMPACT AS THE PULL OF THE LEASH HAD LEVERAGE.

NOW SOMEWHERE I'VE READ ABOUT 18 MPH OCEAN WAVES IN WIND OVERCOME FRICTION TO MAKE DROPLETS IN THE AIR.

THE INFERENCE IS, SINCE BLOOD VESSELS BURST IN SWELLING IN MY LEG THAT 18 MPH IS A POTENTIAL SPEED FOR

OCCURRENCE OF ACCIDENTS IN IMPACT MAY TAKE 10 WEEKS IN A CAST, UNLOADED, TO RECOVER FROM.

FOR A BOAT AT A SPEED TO LENGTH RATIO OF ABOUT 1.1 NOT MAKING MUCH WAKE AT  $\frac{5}{6}(18) = 15$  KNOTS, A VESSEL OF

@  $\frac{V}{L} = 1.1 \quad \left(\frac{15}{1.1}\right)^2 = 186$  FEET IS GOING FAST ENOUGH TO BE ACCIDENT PRONE.

PLANING VESSELS CAN TRAVEL AT SPEEDS OF  $\frac{V}{L}$  4 TO 5 TIMES FASTER, SO THEN WITH THE SAME IMPACT LIMITATIONS;

$$\left(\frac{15}{4.4}\right)^2 \text{ to } \left(\frac{15}{5.5}\right)^2$$

= 11.6 FEET TO 7.4 FEET LENGTH.

PERSONAL WATERCRAFT OF THIS APPROXIMATE LENGTH WERE INSTRUMENTAL IN RIVER RESCUES OF PEOPLE FLOODED OUT OF THEIR HOMES NEAR PITTSBURGH LAST YEAR.

WHILE MY SKIFF AND DINGHY ARE OF THESE APPROXIMATE LENGTHS, MY OARS ARE NO MATCH FOR RIVER CURRENTS SPEED FOR SUCH RESCUES. I ALSO NOTE IT TAKES ABOUT A 15 KNOT WIND FOR "EXCITING" SAILING.

THE PRUDENCE OF WEARING A BICYCLE HELMET WHEN BICYCLING AT SUCH SPEEDS IS PROVEN. SO SHOULD PEDESTRIANS, DECK HANDS, ETC. I THINK. BUT WHAT ABOUT SURFERS! RECENTLY ON TV AN INTERVIEW WITH A SURFER DISCLOSED HIS PARALYSIS OCCURRED WHEN HIS BOARD SUDDENLY RAN ~~AROUND~~ <sup>SHOUL</sup> AND HE TUMBLED INTO SHALLOW WATER HEAD FIRST, ACCUSTOMED TO A USUAL WATER DEPTH TO ALLOW THAT DIVE, BUT THE WAVES WERE SMALL AND MIS-LEADING. THIS IS MUCH THE OPPOSITE OF THE USUAL IMPRESSION OF WAVES TOO ROUGH TO HANDLE. NEVERTHELESS USING THE FORMULA  $SPEED = \sqrt{10D}$  @ METERS/SECOND AND METERS DEPTH, A TIDAL WAVE OR TSUNAMI OF 18 MPH =  $26.4 \text{ FT/SEC} = 8.8 \text{ YARDS} = 8.05 \text{ METERS/SECOND}$  IS AN OCEAN DEPTH OF 6.48 METERS OR 7.085 YARDS OR  $21\frac{1}{4}$  FEET.

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SO I INFER MUCH WAVE ACTION IS IN WATERS LESS THAN  $2\frac{1}{4}$  FEET IN DEPTH. CURIOUSLY IT IS SAID THE AVERAGE DEPTH OF THE ESTUARY BEFORE DREDGING ABOUT 12 FEET. STORM SURGES OF THE ORDER OF 10 FEET HAVE BEEN WARNED OF. I'M MORE ACQUAINTED WITH TIDES AUGMENTED BY WIND.

I WILL SUGGEST THAT WIND, IN DRIVING A ROLLING ELEMENT IS TWICE THE SPEED OF THAT ELEMENT. SO THEN  $\odot(8.05)(2) = 16.1$  METERS/SEC WIND SPEED (I.E. ABOUT 36 MPH) NESHIBA REFERENCES CORNISH 1934 FOR WIND WAVES @ SEA A WAVE SPEED OF 12 M/SEC & SECOND PERIOD, 103 METER LENGTH, 7.7 METERS HEIGHT, HEIGHT TO LENGTH RATIO .074 AND 74.1 KILOJOULES/M<sup>2</sup> ENERGY. CONDITIONS SUCH AS THIS ON THE DAY SEEM TO OCCUR. ONCE AGAIN THE BEHAVIOR OF A COLD FRONT SEEMS TO TAKE THE SHORTEST DOWNHILL PATH, POURING OFF. HIGHER ELEVATIONS & THIS IS LIKELY PERPENDICULAR TO SHORE LINE BLUFFS SO THEN CAN CONCENTRATE WHERE THESE

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PERPENDICULARS INTERSECT, A TRAP TO THE UNWARY, A BOON TO SAILORS SEEKING WIND. YOU HAVE A CHANNEL TO STAY IN, I HAVE ONE TO STAY CLEAR OF. I HAVE MUCH TO LEARN STILL, NOT JUST THE ABILITY TO PROMPTLY REEF TO ABOUT  $\frac{1}{4}$  SAIL AREA, BUT A CONSTANT WATCH.

NESHIBA P. 317 SAYS A WAVE WILL NOT FEEL ANY FRICTIONAL DRAG FROM THE BOTTOM UNLESS ITS WAVE LENGTH EXCEEDS ABOUT TWICE THE BOTTOM DEPTH. SO THE OCEAN WAVES BEGIN TO INTERACT WITH THE BOTTOM IN FRICTION FOR DEPTHS  $\frac{103}{2}$  M. OR 169 FEET DEEP FOR THE 36 MPH WIND EXAMPLE. IN OTHER WORDS BOTTOM SEDIMENT INTERACTION EXTENDS TO SUCH DEPTHS. I HAVEN'T FISHED MUCH IN DELAWARE BAY OR OFFSHORE, BUT NOTE FROM SALMON FISHING IN PUGET SOUND THIS APPROX. DEPTH FITS THE MIXING OF

OFFSHORE SURFACE AND DEPTH  
LAYERS ABOUT INTERFACE, WHAT  
MIGHT BE FOLLOWED AS THE  
LINE OF TIDAL CHANGE. (SEE  
P. 352 NESHOM. OCEANOGRAPHY)

PAGE 353 INDICATES HEARING  
BREEDING AREAS ON THE GRANA  
BANKS ARE IN SUCH MIXED ZONES.

IN MY EXPERIENCE FISHING  
A FRESH WATER LAKE IN MICHIGAN  
IT APPLIES TO MID LAKE SHOALS,  
ALSO.

SO THEN WHEREVER THE  
DEEPER CHANNEL NEARS ANY  
SUCH SHOAL THE OPPORTUNITY  
FOR DEEP WATER FISH TO FEED  
ON SUCH SHOALS IS ENHANCED,  
PROVIDED THE SHOALS HAVE  
SOME INHERENT HOSPITALITY TO  
YOUNG SCHOOLS OF FISH.

THE PROSPECTS OF FISHING  
SUCH PLACES AT APPROPRIATE  
TIMES WOULD SEEM TO OFFER  
CATCHES WOULD BE LESS  
CONTAMINATED BY PCB'S OF  
MORE RESIDENT FISH. CLEARLY  
MANY OF THE NOTIONS OF THIS  
LETTER DEPEND ON LUCK, OPPORTUNITY  
AND PERSISTENCE AS MUCH AS  
KNOWHOW, LOGIC, & PREPARATIONS.  
GOOD LUCK!

Comment noted.