

Delaware River Deepening – Dumped Again

Released: March 2007



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About this Report

For over a decade, the U.S. Army Corps of Engineers has tried to convince the public that deepening the main channel of the Delaware River to 45 feet is in the public interest and does not threaten the Delaware River ecosystem and is economically justified. This report is composed of three parts, an introduction and overview of the project, an evaluation of the Army Corps' most recent economic analysis of the project (Part 2), and a review of some of the more recent and more significant environmental concerns regarding the project (Part 3).

Delaware River Deepening – an Introduction and Overview

In February 1992, the U.S. Army Corps of Engineers recommended a plan to deepen the Delaware River main navigation channel from 40 to 45 feet. The current official Army Corps cost estimate for this project is \$277 million¹ with \$185 million being paid by the federal government and \$92 million being paid by the local sponsor, in this case the Delaware River Port Authority. However, facing major criticism from the US Government Accountability Office (GAO), State and Federal Regulatory Agencies, Federal and State elected officials, economic and environmental experts, environmental organizations, community organizations and the public at large, not an ounce of dirt has been dredged up from the bottom of the Delaware River for this project. Simply put, there is no credible economic or environmental justification for this project – a reality demonstrated by the tremendous lack of needed support for the project:

- ✓ The project does not have needed environmental permits and approvals from both Delaware and New Jersey a demonstration of the threat it poses to our local and regional environment.
- ✓ The project does not have a local share agreement with its local sponsor.
- ✓ The project lacks an approved and viable dredge spoil disposal plan. – no small matter considering that the project will generate 26,012,000 cubic yards of spoils with the initial deepening including approximately 77,000 cubic yards of rock, as well as an increase in annual maintenance spoils of 862,000 cubic yards per year, bringing the total to 4,317,000 cubic yards per year for disposal (up from the current 3,455,000 cy/yr).²
- ✓ The project has not received budgetary support from the President. This judgment by the Executive Branch gives testament to the inadequacies and harms of the project.
- ✓ The project has been found by the GAO to be economically unjustified.

In June 2002, after an in depth review, the GAO issued a report challenging the Army Corps' economic findings for the Delaware River

¹ US Army Corps of Engineers, Delaware River Main Channel Deepening, PA, NJ, DE, Project Fact Sheet, January 2006

² "Delaware River Main Channel Deepening Project, Comprehensive Economic Reanalysis Report", US Army Corps of Engineers, Philadelphia District, December 2002, p 5

Deepening and demonstrating that it is not economically viable.³ Specifically the GAO found:

- “The Corps’ analysis of project benefits contained or was based on miscalculations, invalid assumptions, and outdated information.”⁴
- “We determined that the net effect of the miscalculations, invalid assumptions, and outdated information on the Corps’ \$40.1 million annual project benefit estimate by applying an eight-step iterative approach. ... the net effect of the eight steps was a reduction in the estimated annual project benefits to about \$13.3 million (in 1996 dollars).”⁵

Based on the GAO facts, figures and findings the benefit-cost ratio of the deepening project is more accurately a mere “46 cents for every dollar spent.”⁶

In 2006, the GAO continued to question and challenge the Army Corps findings as they related to the Delaware River Deepening, as well as the processes the Army Corps uses to reach conclusions on this and other major Corps projects. In a statement before the House Subcommittee on Energy and Resources a GAO representative testified:⁷

- “For the Delaware Deepening Project, GAO found credible support for only about \$13.3 million a year in project benefits compared with the \$40.1 million a year claimed in the Corps’ analysis.”
- “GAO’s recent reviews of four Corps civil works projects [including the Delaware Deepening] and actions found that the planning studies conducted by the Corps to support these activities were fraught with errors, mistakes, and miscalculations, and used invalid assumptions and outdated data. Generally, GAO found that the Corps’ studies understated costs and overstated benefits, and therefore did not provide a reasonable basis for decision-making.”
- “[T]he Corps’ three-tiered internal review process did not detect the problems GAO uncovered during its reviews of these analyses, raising concerns about the adequacy of the Corps’ internal reviews.”
- “In closing, Mr. Chairman, we have found that the Corps’ track record for providing reliable information that can be used by decision makers to

³ When the GAO issued its 2002 report on this project, the agency name was the “General Accounting Office.” Subsequently, it has been renamed “Government Accountability Office.” We will refer to this agency as GAO throughout this paper.

⁴ US General Accounting Office, Delaware River Deepening Project, Comprehensive Reanalysis Needed, GAO-02-604, June 2002, p 5

⁵ US General Accounting Office, Delaware River Deepening Project, Comprehensive Reanalysis Needed, GAO-02-604, June 2002, p 26 & 27

⁶ United States Congressman Rob Andrews, 1st Cong Dist NJ, *Hocus-Pocus, The Magic Behind the Delaware River Dredging Project*, March 4, 2003

⁷ Statement of Anu Mittal, Director, Natural Resources and Environment, US GAO, Testimony Before the Subcommittee on Energy and Resources, Committee on Government Reform, House of Representatives, *Corps of Engineers, Observations on Planning and Project Management Processes for the Civil Works Program*, GAO-06-529T, March 15, 2006

assess the merits of specific Civil Works projects and for managing its appropriations for approved projects is spotty, at best. ... the Corps' planning and project management processes cannot ensure that national priorities are appropriately established across the hundreds of civil works projects that are competing for scarce federal resources."

Largely in response to the GAO 2002 report as well as the increasing barrage of opposition and criticism, the Army Corps, in December 2002, issued its 5th report on the proposed Delaware River Main Channel Deepening Project.⁸ Each report was a reconsideration of economic and environmental issues in response to continuing criticism from political, public, regulatory and expert communities all challenging the project's dubious economic value and significant and varied environmental effects.

The Corps' 2002 report did not, however, offer a convincing rebuttal to the remaining criticisms of the project. A major point of contention centered on the Corps' projected benefits related to the importation of crude oil. Consequently a 6th report, "Supplement to Comprehensive Economic Reanalysis Report, December 2002" was released in February 2004. In this document, the Army Corps asserts:

- Crude oil benefits have been recalculated based on a newly developed economic model; nonetheless, they are lower than in the previous analysis.
- The loss of crude oil benefits has been offset by increases in benefits to other commodities.
- The project remains marginally justified with a benefit-cost ratio of 1.15

Rather than substantiate and justify the benefits claimed for this project, the February 2004 Supplement actually bolsters the widely held belief that the Delaware River Deepening project is not defensible. In addition, this present report further demonstrates that questions, concerns, and objections raised by the GAO that Army Corps procedures for analyzing this and similar projects continue to be untrustworthy for both the public and our decision-making bodies.

By any reasonable measure, the Delaware River Deepening has never been shown to be worth doing; it still lacks economic justification and poses significant threats to the ecosystems and communities of the Delaware River Valley.

⁸ These reports are as follows: Delaware River Comprehensive Navigation Study, Main Channel Deepening, Final Interim Feasibility Study and Environmental Impact Statement, February 1992; Army Corps of Engineers Design Memorandum 1996; Final Supplemental Environmental Impact Statement, July 1997; Delaware River Main Channel Deepening Project Limited Reevaluation Report, February 1998; and Comprehensive Economic Reanalysis Report, December 2002

How Should we Be Investing in the Delaware River Ports?

By focusing all of our time, energy and resources on the non-viable strategy of deepening we are failing to look at the other alternatives that truly could make a difference for the future of our port. The success of the Delaware River ports lies in developing them as a strong niche port and by expanding the warehousing facilities available for existing port commerce.

A deepened channel is not needed to support port growth and new business. In the past 5 years alone, without a deepened channel or even the prospect of a deepened channel, the following port growth has been reported in the press:

- August 9, 2001, Sunoco began using the largest ship ever in the port of Philadelphia to transport crude oil up the Delaware River. The new vessel is designed to float higher in the water and can travel up the Delaware's 40-foot deep shipping channel with more crude on board than other tankers.⁹
- August 8, 2003 - Joe Balzano pointed to a 23% increase in plywood tonnage over the previous year coming into SJPC in Camden.¹⁰
- August 21, 2003 - A new 50,000 square foot processing plant at SJ Port Corp, Camden, to process 1 million pounds of cashews each year. Nutsco, the importing company, signed a 20-year lease with SJPC.¹¹
- Friday, Oct 2, 2003 -- SJ Port Corp announced international business opportunities are increasing along the Delaware River. Industry leaders announced record high freight and passenger traffic, a 13% increase over the previous year.¹²
- Mar 20, 2005 - DRPA invested \$15 million to create a festive functional terminal for cruise ships on the Philadelphia side of the River. Royal Caribbean, Norwegian, Celebrity, Deutschland, Radisson Seven Seas, Seabourn and Silversea are all cruise operators that have made Philadelphia a port of call.¹³
- April 14, 2005 - Del Monte Fresh Produce opened a third refrigerated warehouse in Camden. SJPC agreed to build it for them for \$5 million and Del Monte agreed to lease it for 20 years. It pays the port \$1.6 million in rent and employs 26 full time workers.¹⁴
- August 10, 2005 – "Through June 30, total cargo at the port reached 1.81 million tons, an increase of 8 percent over 2004 when the mid-year figure came in at 1.68 million tons, and far eclipsing the 2003 mid-year result of 1.56 million tons of cargo."¹⁵
- August 10, 2005 -- "In my many years at the port I have never seen the demand for port access that we are experiencing today," said Joseph A.

⁹ "Ship Brings More Oil Farther Upriver", Philadelphia Inquirer

¹⁰ "Camden's Plywood Port Stacks up as Tops in US," Courier Post

¹¹ "Importer's New plant will process cashews", Courier Post

¹² "Delaware River ports Traffic Booming", Courier Post

¹³ "Sea Cruises in growth mode", Courier Post

¹⁴ "Fresh Fruit a Port Staple", Courier Post

¹⁵ "Mid-year figures point Port of Camden to third consecutive record year",

<http://www.southjerseyport.com/news.asp>

- Balzano, executive director of the SJPC with over 50 years tenure at the port. " "There are significant increases in several cargo categories including steel, cocoa beans, scrap and Grancem, while containerized cargoes more than doubled from 77,847 container tons in the first half of 2004 to 167,564 container tons through June 30 this year, including all containers into and out of the port." Balzano said, "The infrastructure investments we have made and continue to make at the Port of Camden are being rewarded by increased business that sustains good jobs at the port and at related businesses in the City of Camden, where the port is the largest source of private sector employment and business expansion."¹⁶
- February 1, 2006 – “The South Jersey Port Corp. Tuesday posted record tonnages and earnings for 2005. Total cargoes, including imports and exports, reached 3.6 million tons in 2005, a 3.5 percent hike over last year. Revenues increased to \$23.6 million from \$21.5 million, with net earnings rising to \$3.7 million from \$3.4 million.”¹⁷
 - February 2, 2006 – The South Jersey Port Corporation signed an agreement to construct docks and covered storage in Paulsboro, NJ. As a result Paulsboro “is on its way to becoming an international port on the Delaware River.” The Paulsboro waterfront has a natural depth of 35 feet and would therefore require minimal maintenance dredging. It is predicted the new docks will serve cargo of ships, building materials, chemicals, consumer products and military equipment from around the world.¹⁸
 - August 19, 2006 – Port of Camden received its largest load of plywood ever. “Increasing plywood imports are part of the reason the Camden port is on pace to break a record for cargo this year, according to Joseph A. Balzano, executive director. Last year, the port received cargo totaling 3.5 million tons. Wood products coming into the port from January through July increased more than 20 percent over the same period last year, he said. ‘The arrival of the Maroudio underscores the vitality of the Port of Camden and its position as the number one plywood port in the United States,’ said Balzano.”¹⁹

“The growing importance of feeder ports is a role that is emerging for the Ports of Philadelphia and Camden. The vessels that are becoming available for the feeder trade require less than 40’ draft.”²⁰ As the East/West Atlantic container trades evolve to 4,000 to 6,000 TEU container carriers in the coming decade, these very large deep draft vessels ... will serve only one, two or three ports on the East Coast of the United States and Canada. These high speed high cost ships will shuttle between a couple of these ports and a similar number of hub ports in Europe able to accommodate these ships with drafts of 50 feet or more.

¹⁶ “Mid-year figures point Port of Camden to third consecutive record year”, <http://www.southjerseyport.com/news.asp>

¹⁷ “Record Year for South Jersey Port”, Courier-Post

¹⁸ “Agreement is Signed to Build Paulsboro Port”, Courier-Post

¹⁹ “Plywood Pushing Port to Record”, Courier Post

²⁰ Ports of Philadelphia and Camden – Global Trends, April 4, 1996, Executive Summary

This will lead to increased use of feeder carriers to distribute containerized cargo to the smaller ports like Philadelphia and Wilmington, Delaware. The candidate main ports for this generation of container ships are Hampton Roads, Virginia, Halifax, Nova Scotia, Charleston, South Carolina and possibly New York.”²¹

“Delaware’s maritime future centers on the high value of North/South trades. Land area on the Delaware River can be developed to sustain a larger amount of niche cargoes in these trades which will not need a deeper main channel. Public funds should be directed to developing these niches.”²²

In the part two report that follows, we address the major shortcomings of the Corps’ 2004 supplemental economic analysis and demonstrate that it fails to provide viable economic justification for the project. In part three we identify numerous environmental issues demonstrating that the Delaware River deepening project is not beneficial from a local, regional or national perspective, and in fact poses unreasonable harms and threats. These reports demonstrate how the Delaware River Deepening continues to be a national poster child for how the Army Corps abuses its power and the planning process in order to justify unjustifiable agency proposals. And they demonstrate that deepening the Delaware River is not the best strategy for our ports, our environment or our communities and as such is not worthy of any more of our limited resources, time or consideration.

²¹ Report from “Charles Zeien Associates, Naval Architects, Shipping and ShipBuilding consultants, “Impact on the State of Delaware of a deeper Delaware River Main Channel, March 18, 1998

²² Report from “Charles Zeien Associates, Naval Architects, Shipping and ShipBuilding consultants, “Impact on the State of Delaware of a deeper Delaware River Main Channel, March 18, 1998

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This Project Does Not Pay

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For over a decade, the U.S. Army Corps of Engineers has tried to convince the public that deepening the main channel of the Delaware River to 45 feet is in the public interest. Time and again, it has been demonstrated that the Corps' analysis relies on overly optimistic projections of project benefits and understates the full costs -- especially when the environmental consequences are given their full weight. Even with the inherent biases of their analysis, the Corps itself shows this is at best a marginal project that barely meets criteria for justification.

This paper, an economic analysis of project benefits, is part two of a three part report that explores the most important unresolved issues. Part one presents the basic case for opposing further consideration of the Delaware River project and summarizes the conclusions of parts two and three. Part three addresses the environmental consequences that require resolution if this project is allowed to move forward.

This report was written by Maya K. van Rossum, the Delaware Riverkeeper and David R. Conrad, Senior Water Resource Specialist with the National Wildlife Federation, based in part on economic analyses provided by Dr. Robert Stearns. Dr. Stearns was commissioned by the Delaware Riverkeeper Network and the National Wildlife Federation to conduct this economic analysis. Dr. Stearns is an independent consultant with an extensive background in transportation economics. In addition to his consulting work, he has taught courses in economics at the University of Maryland's School of Public Policy. He served as Deputy Assistant Secretary of the Army (Civil Works) where he worked on a wide variety of Army Corps of Engineers Civil Works issues. His total federal service covered 20 years for the Department of Transportation, the Army Corps of Engineers, and the Assistant Secretary of the Army (Civil Works). Previously, he had spent 10 years in academia. He received his PhD in economics from Yale University and his BA in mathematics from Swarthmore College.

Executive Summary

Despite numerous revisions to its economic analysis, originally described in its 1992 Feasibility Report, the United States Army Corps of Engineers has not been able to silence the criticisms offered by independent analysts on the economic merits of its proposed Delaware River deepening project. The Army Corps' most recent report "Supplement to Comprehensive Economic Reanalysis Report, December 2002" released in February 2004 (hereafter "2004 Supplement Report") does not put these matters to rest.

As in the previous reports, the major benefiting cargo is crude oil imports. While the Army Corps has adjusted its forecasts and models to address some of the most obvious flaws in its previous analysis, it has still not been willing to accept and portray reality.

A fundamental mistake is the Army Corps' failure to accept the planned and implemented business strategies of Maritrans, the major company involved in lightering large crude oil tankers so that they can move up the Delaware Channel at its current and proposed future depths. While Maritrans' approach represents a least-cost solution to changing market conditions, it does not provide the level of savings anticipated by the Army Corps that is needed to make the proposed project justified.

While projected crude oil benefits have been reduced from one Army Corps report to the next, container ship benefits have increased. The primary beneficiary is projected to be the importation of meat and other products from Australia and New Zealand. But recent losses in market shares for this business calls into serious question whether there will be any benefits at all. Benefits derived from shipping produce into Philadelphia from the East Coast of South America are also overstated.

It has recently been argued by project advocates that deepening of the channel will create opportunities for Philadelphia to divert traffic from New York and to compete with other major ports. The Corps of Engineers has never recommended channel deepening for any port based on the port's ability to take traffic from elsewhere. Before this became the justification for using Federal funds to deepen the Delaware River, the Corps would have an obligation to include the loss of traffic in other ports in its over all benefit-cost analysis. This change would, by itself, almost surely show that there is no national economic interest in this project.

Certain important policy issues remain unaddressed by project advocates. In comparison to many other Army Corps projects, the Delaware River deepening can, at best, be described as a low priority project that cannot and should not successfully compete for limited budgetary funds. In addition, the Army Corps has not shown how much of its projected benefits accrue to citizens and other

economic entities of the United States. Unless this question is addressed, the value of the project to U.S. taxpayers remains seriously in doubt.

Economic Outlook- Where are the Benefits?

I. Crude oil benefits

While there have been radical changes in the benefit levels from one report to the next, crude oil facilities have continued to be the largest beneficiary group of the Delaware River Deepening Project. According to the Army Corps' 1998 Limited Reevaluation Report more than 80 percent of the project's benefits are attributed to crude oil imports.²³ In its 2002 Economic Reanalysis, 60 percent of the benefits from the proposed deepening project accrue to these activities.²⁴ According to the 2004 Supplement Report 50 percent of the benefits of the deepening project accrue to Delaware River oil facilities.²⁵

Although detailed specific numerical calculations are not included in either the 2002 or 2004 report, we can describe the processes of analysis used. The 2002 conclusions of the Army Corps were based on a simple premise: since Maritrans currently uses three vessels to service the lightering trade, a 31 per cent reduction in lightering requirements will allow them to eliminate one of the three vessels from their fleet.²⁶ This in turn will allow them to keep average costs per barrel lightered at roughly the same rate as the current average costs. Lightering benefits equal the reduction in the number of barrels lightered times the (constant) cost per barrel.

In our last report²⁷ we pointed out several flaws in this analytical approach. First, we demonstrated that the Maritrans fleet is used for multiple lightering purposes (including off shore lightering). This meant that, from Maritrans' perspective, the reduction in business levels resulting from a deeper channel would be only 23 percent.²⁸ Second, we pointed out that even if the amount of time during the actual lightering process would be reduced by the need to lighter less oil, other time elements in lightering operations would not change. This is because the same number of crude oil tankers would show up at both the "with project" and "without project" channel depths. Using time instead of barrels as the constraining variable, the reduction in activity would be even less.²⁹ Third,

²³ Limited Reevaluation Report, US Army Corps of Engineers, Philadelphia District, February 1998, p. 2, hereinafter referred to as "Army Corps 1998 Limited Reevaluation Report."

²⁴ "Delaware River Main Channel Deepening Project, Comprehensive Economic Reanalysis Report", US Army Corps of Engineers, Philadelphia District, December 2002, p 13; hereinafter referred to as "Army Corps 2002 Comprehensive Report."

²⁵ Delaware River Main Channel Deepening Project, Supplement to Comprehensive Economic Reanalysis Report December 2002, Army Corps Philadelphia District, February 2004, p 45; hereinafter referred to as "Army Corps 2004 Supplement Report."

²⁶ Army Corps' 2002 Reanalysis Report, Benefits Appendix, p C-38

²⁷ Delaware Riverkeeper Network and National Wildlife Federation, "Strike Three... The Army Corps Fails Again to Justify the Delaware River Deepening Project" July 2003.

²⁸ "Strike Three...", p 7

²⁹ We estimated a 6 percent reduction when all factors were considered. "Strike Three..." p 8

given the limited reduction in activity, Maritrans demonstrated that sound business practices required that they maintain three vessels. In such a business environment, the only way to cover costs would be to raise the price per barrel lightered.³⁰

The Army Corps' 2004 benefit revisions involve a two-step analysis. First, instead of asking Maritrans what they would do in the face of reduced demand for their services, the Army Corps outlines various scenarios that all support the Army Corps' approach to benefit estimates:

“Although it is not appropriate to forecast the business management decisions of an individual firm for the purposes of estimating NED benefits, a listing of possible alternative employment decisions is provided below. The lightering firm may choose to execute any one of these management decisions, or all of them, or any combination that the firm considers appropriate, if the Delaware River channel is deepened.”³¹

Conspicuously absent from this list is Maritrans' decision to maintain a dedicated fleet of three vessels for its Delaware River business. This omission avoids an important conclusion. As the Army Corps acknowledged in its 2002 Reanalysis Report, if Maritrans were to continue to use all three vessels (the without project fleet) under with project conditions to service the reduced lightering volumes (31 percent lower in base year) the benefit-cost ratio for the deepening project would fall to 0.82.³² In fact, in 2005, Maritrans contracted for the construction of 3 new lightering vessels that would replace and increase the capacity of their current fleet.³³

The Army Corps' second step is to base its calculation on a newly developed simulation model that, in the Army Corps' opinion, accurately reflects the most likely lightering activities in the “without project” and “with project” scenarios derived from the possible “management decisions” developed in step one. Although the details of this model are not spelled out in the Report, one example of the model's outcomes is displayed. In the table below we reproduce the “Sample Future Annual Vessel Cost Calculation” that the report includes,³⁴ but

³⁰ Since these changes are a consequence of cost revisions and not simply higher prices derived from Maritrans' market power, they represent a true reduction in NED benefits as defined by the Army Corps of Engineers.

³¹ Army Corps 2004 Supplement Report, p 4

³² Army Corps 2002 Reanalysis Report p 25

³³ In a September 6, 2005 press release, Maritrans announced that it had signed a contract to build three new vessels each having a carrying capacity of 335,000 barrels in order to replace the existing 3 vessel fleet the company currently uses. The company expressed its expectation that the vessels would be used to fulfill the terms of a recently signed long term contract with Sunoco Inc., while the remaining volume will be delivered to other Maritrans lightering customers on the Delaware River.

³⁴ Army Corps 2004 Supplement Report, p 11

we add an additional column to demonstrate the analytical weakness of this approach. The Army Corps' numbers display the model outcomes for a single lightering vessel under the assumptions built into the model.

	Without Project	With Project	Percentage Reduction ³⁵
Total Barrels Lightered	36,863,601	29,380,968	20
Total Operational Hours	8,230	6,951	15
Total Resource Cost	\$10,180,668	\$7,631,170	25

A 20 percent reduction in barrels lightered leads, as expected, to a smaller (15 percent) reduction in operational hours. Yet the resource cost is reduced by 25 percent. This can only occur if the cost per barrel lightered is reduced in the “with project” scenario. However, Maritrans has argued that the cost per barrel lightered will actually increase in the “with project” scenario³⁶ of its recent commitment to a three vessel fleet supports the view that this is the most cost effective business strategy. In this case, reducing the volume lightered will increase the cost per barrel. Since this is true for the most cost effective strategy, it should also be true for any of the alternatives modeled by the Corps.

In addition to the analytical problems already discussed, the Army Corps' 2004 Supplement report describing revised crude oil benefit estimates raises new questions. According to this report, lightering costs savings are only 53 percent of total benefits accruing to crude oil shipments.³⁷ Apparently, some other characteristics of the shipping process are generating roughly one half the benefits despite the fact that the same vessels will arrive in both the “without project” and “with project” scenarios. The primary difference in the scenarios is that more oil will be lightered in the “without project” condition. Given the careful attention paid to lightering operations in the Army Corps reports, one would expect that they would contribute the most to project benefits. While there may be some other operational efficiencies associated with a deeper channel, it is hard to see why they would generate almost half of the benefits. The Army Corps reports do not provide the underlying reasons for this finding,

How have the Delaware River refineries reacted to this proposed project? Despite the benefits claimed, the Army Corps does not have commitments from the beneficiary oil facilities that they will invest the over \$22.6 million of private

³⁵ We have added the “percentage reduction” column to the Army Corps' table.

³⁶ “Strike Three...”, p 9

³⁷ Army Corps' 2004 Supplement Report, p 12

funds that will be required to take advantage of the deepened channel,³⁸ one of the oil facilities (Motiva) has said a deepened channel will increase their company's maintenance costs,³⁹ and others have expressed doubt as to their willingness to invest these funds in order to take advantage of the project.⁴⁰ In no instance has an oil facility committed to taking advantage of the project, and in no instance has an oil company offered to contribute even one dime towards funding the local or federal share portion of the project. Despite the clear likelihood that some or all of the oil companies may not invest to take advantage of the project, the Army Corps has failed to provide a benefit-cost calculation that represents a scenario where one or more of these primary project beneficiaries, the Delaware River oil facilities, fail to take advantage of the project.

The Army Corps' 2004 Supplement report also contains the following communication from Coastal Eagle Point, one of the potential beneficiaries:

"In summary, the potential for significant savings from crude oil lightering exist, however, not to the extent stated by the ACOE and subject to any increase in rates or reduction in equipment which would significantly reduce or eliminate these savings.

"While Coastal understands that a deeper channel would be beneficial to some users and is desirable for the port as a whole, Coastal is unable to support the stated savings and considers it possible that their transportation costs could increase under with-project conditions. Their rationale is based upon their view of the dominant position that Maritrans has in the lightering market.

"Coastal's other main concern is with the docks and notes that while the berths have historically have [sic] been subject to scour and dredging costs have been insignificant, cost associated with berth modifications necessary to accommodate deeper vessels are unknown at this time and may be prohibitive.

³⁸ Army Corps 2002 Reanalysis Report, p 17

³⁹ Thomas A. Grigalunas, Ph.D. and James J. Opaluch, Ph.D., Proposed Delaware River Channel Deepening Project: Review and Critique of Economic Analysis, prepared for DNREC, April 2002. In its 2004 Supplement Report the Army Corps seems to acknowledge the lack of benefits to Motiva.

⁴⁰ "Critics Claim no benefit to dredging", Gloucester County Times, September 17, 2000; "Questions haunt economics of \$311 million river project." Courier Post, April 16, 2000, Cost figures found at "Delaware River Main Channel Deepening Project, Comprehensive Economic Reanalysis Report", US Army Corps of Engineers, Philadelphia District, December 2002; Information regarding facility participation: Army Corps of Engineers, Internal memo CENAP-PL-P, April 16, 1991; Army Corps of Engineers, ST Hudson Engineering report, August 3, 1994; Army Corps of Engineers, ST Hudson Engineering report, July 1, 1994, Army Corps of Engineers, ST Hudson Engineering report, August 17, 1994, Army Corps of Engineers, ST Hudson Engineering report, May 23, 1994, Philadelphia Business Journal, Deconstructing Dredging, January 8-14, 1999.

“In light of the above, Coastal’s position is to wait and see, and to respond to prevailing conditions (physical and economic) that accompany channel deepening as the project proceeds.”⁴¹

Finally, current conditions in world crude oil markets create a significant uncertainty with regard to future U.S. imports of crude oil. If less oil is imported into the Delaware River refineries, the project’s benefits will be lower. Currently, the Energy Information Administration (EIA) is predicting that in its “reference case,” U.S. gross imports of crude petroleum will grow 1.0 percent per year through 2030 (the last year of the forecast).⁴² This prediction assumes that crude oil prices will be lower throughout the period ending in 2030 than they were in 2006. It also assumes no significant change to current U.S. energy policies. Given current events (described below), there is a significant probability that crude oil imports will fall instead of meeting the modest 1.0 percent growth of EIA’s reference case.

Since the Corps’ 2002 and 2004 reports, there have been well documented changes in the market for crude oil and crude oil imports into the United States. The most obvious change has been in the price of oil. The average of weekly spot crude oil prices in 2004 was \$41 per barrel; by 2006 it had increased to \$66.⁴³ Such changes are the result of shifts in worldwide demand as well as supply side shocks such as the consequences of hurricane Katrina in the Gulf Coast and decisions made by OPEC. When higher prices are driven by supply shocks, consumers react in the expected way by cutting back demand.

Price levels are an important variable in projecting future activities including crude oil imports. As an example, the “high price scenarios” developed by the Energy Information Administration (EIA) include a forecast of significantly lower levels of imports in comparison to EIA’s reference case. The 2030 forecast is 19 percent lower in the high price case.⁴⁴

The effect of higher prices in 2006 may also have been a contributing factor to the reduced level of crude oil imports for all U.S. ports and for Philadelphia in particular. The import data is presented in the following table:⁴⁵

⁴¹ Army Corps 2004 Supplement Report, p 59. Curiously, the Army Corps’ response states that: “The letter from Coastal Refinery dated September 3, 2003 generally confirms modeling assumptions used in the benefit analysis, and confirms the overall findings of the analysis.” See p 60

⁴² Energy Information Administration, Annual Energy Outlook, 2007, Table 11. This is the national forecast; the distribution by point of import is not shown.

⁴³ Energy Information Administration, http://tonto.eia.doe.gov/dnav/pet/pet_pri_top.asp. Weekly prices are Cushing, OK WTI Spot Price FOB (Dollars per Barrel) The highest price of oil was \$75.63 per barrel in the week of August 11, 2006

⁴⁴ Energy Information Administration, Annual Energy Outlook, 2007, p. 177

⁴⁵ U.S. Bureau of Census, Foreign Trade Division, USA ® Online. Figures for 2006 include year to date through November plus average imports in Decembers of 2003-2005.

Year:	Crude Oil Imports, All Ports (thousands of short tons)	Crude Oil Imports, Philadelphia (thousands of short tons)
2003	497,543	64,018
2004	519,306	64,218
2005	517,764	64,946
2006	510,643	60,387
Reductions in Imports, 2005 to 2006 as percent of 2005	1.4%	7.0%

In addition to the price effects on crude oil imports, there is an increasing probability that over the 50 years of this project, the United States will reduce its dependency on foreign oil. In his most recent State of the Union speech, President Bush stated that:

“For too long our nation has been dependent on foreign oil. And this dependence leaves us more vulnerable to hostile regimes, and to terrorists -- who could cause huge disruptions of oil shipments, and raise the price of oil, and do great harm to our economy. ...

“We made a lot of progress, thanks to good policies here in Washington and the strong response of the market. And now even more dramatic advances are within reach. Tonight, I ask Congress to join me in pursuing a great goal. Let us build on the work we've done and reduce gasoline usage in the United States by 20 percent in the next 10 years. When we do that we will have cut our total imports by the equivalent of three-quarters of all the oil we now import from the Middle East.”

If the United States takes serious actions to reduce this dependency, either through the market or through federal policy, this would have a mitigating effect on the severe impacts of higher oil prices currently being felt in the U.S. economy. While this would certainly be good public policy, it makes it even less likely that the Delaware River deepening project will ever pay for itself.

II. Container ship benefits

There are two container shipping services that are described as beneficiaries of the proposed deepening project in the Army Corps' 2004 Supplement Report. Both cases involve the import of frozen and refrigerated foods. The largest share of benefits is derived from the shipment of (primarily) meat imports from Australia and New Zealand (ANZ). The smaller share results from shipments of (primarily) fruits and vegetables from the eastern coast of South America (ECSA).

These benefit categories have taken on increasing importance in each subsequent Army Corps report. In 1996, container cargo benefits were 11 percent of the total.⁴⁶ This increased to 14 percent in 2002 and 25 percent in 2004.⁴⁷ As we demonstrate below, both shipping category benefits appear to be significantly overstated.

Meat Imports from Australia and New Zealand (ANZ)

The Army Corps derives benefits to the ANZ traffic by the following logic:⁴⁸

- Approximately 574 containers of refrigerated and frozen meat were delivered to Philadelphia on a weekly basis in 2003.
- By 2009, there would be a requirement of 902 containers per week
- Because of the current channel depth, none of the additional 328 containers could be shipped to Philadelphia on existing ships.
- The cheapest way to get the additional containers to Philadelphia would be to ship them to New York and then, transship them to Philadelphia via truck.
- The incremental trucking and other landside costs⁴⁹ for this traffic would be \$5.2 million per year.
- Since all containers, including the incremental traffic, would be shipped directly to Philadelphia if the channel were deepened, all of the incremental trucking costs would be saved; project benefits for this traffic would be \$5.2 million.

The projected change in imports of ANZ meat products between 2003 and 2009 represents a 7.8 percent annual rate of growth. It is important to note that the benefits are attributable only to the incremental traffic. Without growth, there would be no benefits. Using the Army Corps' methodology, if ANZ meat imports grew by only one half the projected rate (3.9 percent), the ANZ benefits would fall to \$2.3 million. Lacking any other changes in the Army Corps' benefit cost analysis for all other commodities, costs, etc., this change alone would reduce the project's benefit cost ratio to 1.02. A "breakeven" growth rate of 3.3 percent or less would bring the project's benefit cost ratio below 1.00.

What has happened to ANZ meat imports into Philadelphia since the Army Corps' report? Data through 2006 is now available from the U.S. Census

⁴⁶ Army Corps, 1998, Limited Reevaluation Report, Table 1, p 21

⁴⁷ The 2002 and 2004 percentages are derived from Table 12 of the Army Corps 2002 Comprehensive Report, p. 45

⁴⁸ Army Corps 2004 Supplement Report, p 26-28

⁴⁹ Other landside costs include lift fees, royalty fees, etc. There would be some trucking and other landside costs if the cargo was delivered to Philadelphia. The Army Corps' estimate is the difference between these costs from New York and from Philadelphia.

Bureau. This data, displayed in the table below, shows ANZ meat imports rising by 4 percent between 2003 and 2004 but falling by 18 percent between 2004 and 2005 and rising only 1 percent between 2005 and 2006. In other words, ANZ imports into Philadelphia in 2006 were only 86 percent of the 2003 total.

Meat Imports into Philadelphia District, 2003-2006 (thousands of short tons)

	-----Year-----			
	2003	2004	2005	2006
Australia	268.3	278.5	229.4	227.5
New Zealand	112.1	118.1	97.2	101.2
ANZ (combined)	380.4	396.6	326.6	328.7
Uruguay	12.4	85.3	114.0	67.1
All Other	4.0	4.4	3.8	3.2
Total	396.8	486.2	444.5	399.0

Source: U.S. Bureau of Census, Foreign Trade Division, USA ® Online. Figures for 2006 include year to date through November plus December estimated total

The pattern of world trade in meat products has changed dramatically during this current decade and remains unstable. While there are many factors such as weather and changes in consumer tastes, a primary influence has been the presence or absence of animal diseases, most notably bovine spongiform encephalopathy (BSE), rinderpest and foot and mouth disease (FMD) Recently, many of the major Asian markets have been closed to the United States due to the detection of BSE (some of these markets are now reopening). This has been a significant opportunity for Australia and New Zealand producers. and represents an obvious alternative to selling in the U.S. market. For example:

“Dry weather and ample opportunities for Australian beef in Asian markets meant that Australia exported about 16 percent less beef to the United States in 2005, filling only 79.7 percent of its TRQ [tariff rate quota]. Preliminary U.S. import data from Australia for January-August 2006 show an 11 percent decrease compared to the same time in 2005, filling only 47 percent of its TRQ.”⁵⁰

⁵⁰ Gregg Doud and Julie McWright, “Imports Continue Downward Trend,” Issues update 29, September-October 2006, National Cattlemen’s Beef Association, available at <http://www.beefusa.org/uDocs/importscontinuedownwardtrend.pdf>. Doud and McWright are citing statistics for the entire United States. The trends in Philadelphia mirror the rest of the country.

Meat imports into the United States are banned from many countries due to the detection of FMD. The recent increase in imports from Uruguay, evident in the table above, result from the lifting of this ban in May 2003. Uruguay's share of Philadelphia bound traffic rose from 3 percent in 2003 to 26 percent in 2005. before falling to 17 percent in 2006.

More recently (January 2007), the U.S. Department of Agriculture has proposed lifting the FMD ban for meat raised in Southern Patagonia (Argentina). According to one source,

“the region of Argentina being considered for U.S. shipments is best known for sheep production. The Argentinean government estimates that 60 percent of that nation's sheep flock resides in the Patagonia South region. USDA officials, after consulting with the Argentine government, said they expect the regulations will result in annual U.S. imports of 13.2 million pounds of sheep meat.”⁵¹

This represents an important new competitor for both Australia and New Zealand. Even if some of this commerce comes to Philadelphia, it has not been demonstrated that it would require a 45 foot channel to accommodate the new trade.

Unless there is a dramatic reversal of the recent trend, ANZ imports will fall far below the amounts forecast for 2009 in the Corps' 2004 Report. Since benefits are attributable only to traffic above the 2003 level, this change alone would bring the project's benefit-cost ratio well below 1.0

East Coast, South American fruit and vegetable imports (ECSA)

The ECSA benefits are derived as follows:⁵²

- Because of depth constraints on the Delaware River ECSA carriers routinely go to the Port of New York and New Jersey (NY/NJ) before going to Philadelphia. This port rotation allows for unloading a sufficient volume of cargo to reduce the ship sailing draft sufficiently to allow passage up the Delaware.
- A fraction of the cargo unloaded at NY/NJ is then transshipped to Philadelphia's refrigerated warehouses via truck. The average weekly shipment is 70 containers.
- The incremental landside costs⁵³ represent a project benefit.

⁵¹ Western Livestock Journal, January 22, 2007

⁵² Army Corps 2004 Supplement Report p 23-25

⁵³ As in the case of meat imports, there would be some trucking and other landside costs if the cargo was delivered to Philadelphia. The Army Corps' estimate is the difference between these costs from New York and from Philadelphia.

- Each of the 70 containers a week incurs \$258 in incremental landside costs.
- Total benefits = 52 x 70 x \$258 = \$939,120 per year.

Although New York may not have the same concentration of refrigerated warehouse facilities as Philadelphia,⁵⁴ more than one half of the total ECSA produce shipped to the two ports combined is bound for NY/NJ markets. According to the Army Corps, approximately 560 TEUs⁵⁵ per call are off-loaded at NY/NJ (first port of call) and 195 TEUs are off-loaded at Philadelphia (second port of call). Of the 560 TEUs off-loaded at the Port of NY/NJ, 20% or 112 TEUs (70 containers) are immediately placed on trucks for express delivery to Philadelphia.⁵⁶ Combining containers delivered to both ports, 448 TEUs (560-112) remain in the New York market, 307 (195+112) go to Philadelphia.

The Army Corps' data suggests that it is not necessary to unload as much of this Philadelphia bound produce at NY/NJ in order to use the current depth of the Delaware River. In 2003, the average underway draft of the ships in this trade arriving at Philadelphia was 35.1 feet⁵⁷ compared to a maintained depth of 40 feet. Instead, it is the time sensitive nature of the commodities that are driving this decision. Ships arriving in NY/NJ are scheduled to arrive at Philadelphia two days later.⁵⁸ Apparently, the two day delay reduces the value of the delivered produce as it is less fresh when it gets to Philadelphia. In the Army Corps' view, the loss in value exceeds the land side costs of shipping "fresher" produce from New York to Philadelphia.

If, as the Army Corps claims, Philadelphia-bound produce is so time sensitive, we would expect this to be true of NY/NJ bound produce as well. There is no way to determine how much NY/NJ traffic would be off-loaded at Philadelphia if Philadelphia became the first port of call since currently; NY/NJ is the first port of call.⁵⁹ Under the existing port of call order, 36 percent of Philadelphia ECSA produce is unloaded at NY/NJ. If the same percentage were applied to NY/NJ bound traffic, the reverse trucking flow would be larger than what is currently observed (as stated above, the total NY/NJ market exceeds the Philadelphia market).⁶⁰

⁵⁴ Army Corps 2004 Supplement Report p 20-21

⁵⁵ TEU = "Twenty Foot Equivalent Units, a standard measure of the volume of container traffic.

⁵⁶ Army Corps 2004 Supplement Report, p 17

⁵⁷ Derived from the Army Corps of Engineers 2004 Report, p 76-77

⁵⁸ Sailing schedules are available at http://www.hamburgsud.com/WWW/EN/E-Business/Sailing_Schedules/By_Service/index.jsp. The Army Corps' report does not contain an estimate of the time required to transship the produce via truck.

⁵⁹ Vessel capacity, for example, could be a limiting factor.

⁶⁰ In its ANZ benefit analysis, the Army Corps does predict a reverse land flow if the Delaware River channel is deepened (see p 31)There is no similar analysis regarding ECSA benefits.

Based on the Army Corps' analysis of port fees, it is more expensive to unload cargo at NY/NJ.⁶¹ Even if this is true, the smaller per-container landside cost differential of a reverse flow would be offset (at least partially) by the higher volume.

We will not try to estimate the costs of the reverse flow, but it is likely that there should be virtually no benefits attributable to the proposed Delaware River deepening project from imports of fruits and vegetables from the east coast of South America.

Modeling Assumptions

Because of time and resource constraints, our analysis takes, as a point of departure, the Corps' basic modeling assumptions as given. These models drive the Corps' conclusion that without the project, there will be significant amounts of imported food products off-loaded in New York and shipped by truck to the Philadelphia market. This model was scrutinized in detail by the Corps' own Independent Review Team who expressed grave doubts about the validity and even the accuracy of the Corps' approach:

“This without-project scenario represents a significant departure from existing services, and entails roughly \$5 million in annual costs to the carriers and/or customers involved. The analysis to date does not demonstrate that the trucking scenario is a least-cost, long-term solution to the challenges of without-project cargo flows. The realism and amount of the project benefits from avoiding the without-project scenario costs are therefore still uncertain.”⁶²

In the Corps' view these concerns, contained in the Review Team's report dated January 15, 2004, were adequately resolved before publication of the Supplement Report dated February 2004, although:

“The Headquarters reviewers recognize that not all uncertainties identified by the Review Panel have been removed from the analysis of container shipments, however additional supporting information has been included.”⁶³

⁶¹ Army Corps 2004 Supplement Report, p 83 The primary difference in unloading costs is an “ILA Unit Assessment: that is specific to the Port of NY/NJ” (ILA = International Longshoreman's Association)

⁶² Army Corps, “Delaware River Main Channel Deepening Project, External Independent Review Team Assessment of Container Benefits Analysis,” January 15, 2004, p 9

⁶³ Army Corps, “Delaware River Deepening Project, District Responses and Headquarters Assessment of Final Supplemental Report and Issues Raised by the External Review Panel,” March 9, 2004, p 2

These remaining uncertainties cast further doubt that the benefits to container cargo as described by the Corps (refrigerated meats and produce), will ever be realized.⁶⁴

III. Other unresolved economic issues

In our 2003 report, we raised other economic issues that should be an integral part of the decision-making process regarding the Delaware River project. Despite the importance of these issues, the Army Corps has not addressed them in any substantive way. They are certainly not resolved in the Army Corps' 2004 Supplement Report.

When the Delaware River deepening project is considered by itself, there is no economic justification for its construction. When it is put in the context of the entire Army Corps of Engineers Civil Works program, the case against construction is even more compelling.

The Army Corps itself recognizes that there are a large number of civil works projects competing for limited federal funds:

“In recent years, many more construction projects have been authorized, initiated, and continued than can be constructed efficiently at any one time. This has led to the postponement of benefits from the most worthy projects, which has significantly reduced overall program performance. To remedy this situation and to achieve greater value to the Nation from the Civil Works construction program, the budget focuses significant funding on the projects that yield the greatest return to the Nation, based upon objective performance criteria.”⁶⁵

At the heart of the performance measurement system is a comparison of the payoffs to each project:

“All ongoing, specifically authorized construction projects... will be assigned... to one of the main mission areas of the Army Corps (flood and storm damage reduction; commercial navigation; aquatic ecosystem restorations) or to hydropower. Projects, except for

⁶⁴ The release dates for the Independent Review Team report (Jan 15, 2004), the Supplement Report (February 2004) and the Headquarters critique of the Review Team's comments (March 9, 2004) suggest that at best, there was limited time used to resolve these important issues. For a more detailed critique of the Corps' Independent Review procedures, see "Strike Three..." p 29-34

⁶⁵ "Complete statement of the Honorable John Paul Woodley Jr., Assistant Secretary of the Army (Civil Works) before the Subcommittee on Energy and Water Development Committee on Appropriations, United State House of Representatives, on the Army Civil Works program, Fiscal Year 2007," March 2, 2006, p 8

aquatic ecosystem restoration projects, will be ranked by their remaining benefits divided by their remaining costs (RBRC), calculated at a seven percent real discount rate.”⁶⁶

It is well known that in benefit-cost analysis, projects look better when the discount rate is lower.⁶⁷ Since the Delaware River’s current 1.15 benefit-cost ratio is calculated using a 5.625 percent discount rate, it overstates the value of this project when the common 7 percent standard is used. In fact, according to the Corps’ “Enacted Fact Sheet” for this project, dated Jan 2006, the remaining benefits to remaining cost ratio at 7 percent is only 1.03.

From a budget allocation perspective, how does the Delaware River project rank relative to other projects?

- There are 106 construction projects included in the Corps’ 2007 budget request⁶⁸ The Delaware River is not among them.
- There are 74 additional projects included in the Corps’ Five Year Development Plan.⁶⁹ The Delaware River is not among them.
- There are 128 additional projects, including the Delaware River recommended for funding by either the House and/or Senate for 2006.⁷⁰ Of these:
 - 36 have a higher remaining benefits to cost ratio compared to the Delaware River, only 4 have a lower ratio
 - the remaining 87 projects, including 46 for environmental purposes, have no reported ratio
- From the Corps’ perspective, the Delaware River Deepening River Project ranks no higher than 217th place among its current construction projects. This does not include the 87 projects with no reported benefit-cost ratio
- In addition, there are over 300 studies for new projects, recommended for funding or funded in FY 2006

We are left with the following conclusions:

- Even in the unlikely case that the Army Corps has correctly identified and quantified all project benefits, the benefit-cost ratio,

⁶⁶ Id, p 17

⁶⁷ We demonstrated this in our previous report, “Strike Three...,” p 17-19

⁶⁸ Fiscal Year 2007 Civil Works Budget for the U.S. Army Corps of Engineers, February 2006. The total includes construction projects in the MR&T account and 13 projects moved from construction to O&M.

⁶⁹ Department of the Army, U.S. Army Corps of Engineers Civil Works Program Five-Year Development Plan, Fiscal Year 2007- Fiscal Year 2011, March 1, 2006

⁷⁰ House Report 109-474 and Senate Report 109-274. Benefit cost ratios for some projects are reported in Enacted Fact Sheets, available at

http://www.usace.army.mil/cw/cecwb/budget2007/fy06_enacted_fact_sheets.pdf, p 378

using a common discount rate is barely above the threshold value of 1.0.

- There is a long line of Army Corps projects that have a greater justification for federal funds; construction of the Delaware River project, especially given the extraordinary efforts that must be undertaken to restore New Orleans and the Gulf Region, would be fiscally irresponsible.

The Army Corps ignores the fact that even in their “most likely” case the return to U.S. taxpayers does not exceed the taxpayers’ cost.

If deepening were to occur even despite having a benefit-cost ratio less than 1.0, there would still be “winners” (who receive project benefits) and “losers” (who pay the costs). Whatever project benefits may be obtained, they are not simply passed along to U.S. consumers in the form of lower prices. The commerce in question involves international trade and it should be expected that the distribution of benefits will not be limited to the United States.

The recent controversy surrounding the proposed management of east coast ports by Dubai Ports World shows very clearly why taxpayer benefits are unlikely to exceed taxpayer costs even if the Army Corps’ figures are taken at face value. In this case, the United Arab Emirates state-owned company acquired the current (British) port management company for \$6.8 billion. Why would a foreign firm offer to pay \$6.8 billion for such a purpose? Because it expects to get a return on this investment. Since Philadelphia was one of the affected ports it is reasonable to conclude that some of the benefits attributable to the deeper channel would result in a higher rate of return to the port management firm. If U.S. ports are managed by foreign owned companies, the profits (hence a portion of the project benefits) would accrue to non-U.S. interests.

In our 2003 report,⁷¹ we pointed out that foreign shipping firms would probably receive benefits, a fact recognized by the GAO:

“[I]t is uncertain whether all of the potential benefits of a 45-foot channel would contribute to national economic development because most of the ships coming into Delaware River ports are foreign-owned. The Army Corps’ analysis did not take into account the distribution of project benefits between U.S. and foreign interests.”⁷²

The losers will be the U.S. taxpayers who pay for the project. While there is some local cost-sharing, fully 71 percent of total project costs will be

⁷¹ “Strike Three . . .,” p 20-22

⁷² U.S. General Accounting Office, “Delaware River Deepening Project, Comprehensive Reanalysis Needed,” June 2002, p 15

financed through general revenues of the U.S. Treasury, financed by taxpayers who will receive virtually no benefits.⁷³

As we explained, the Army Corps chooses to ignore this important distributional question, justifying its approach by referring to the United States Water Resources Council's "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies," March 10, 1983. These principles were written to provide guidance to studies of water resource projects. They require that agencies calculate "**national economic benefits**."

"Contributions to national economic development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the **direct net benefits that accrue in the planning area and the rest of the Nation** [emphasis added]." ⁷⁴

With the Delaware River project's low benefit-cost ratio, the truly "national benefits" cannot possibly exceed project costs. It is inappropriate to ask U.S. taxpayers to subsidize foreign interests. In fact, the Army Corps should be obligated to undertake analysis and report on the results to show the extent to which foreign interests benefit from this taxpayer funded project so that others may make independent judgments regarding the project's merits.

⁷³ The Federal cost share is derived from the Enacted Fact Sheet for the Delaware River Deepening Project (op cit).

⁷⁴ United States Water Resources Council, "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies," March 10, 1983, p iv.

Conclusion

In our analysis we have focused on project benefits and concluded that, based on the Army Corps 2004 Supplement Report, any such benefits accruing to the U.S. taxpayer would almost certainly be less than project costs. Our reasons include:

- Inappropriate modeling of crude oil benefits;
- Misuse of crude oil refineries and related industries' comments;
- Changes in market shares for U.S. meat imports that occurred after the Army Corps' period of analysis;
- Failure to consider reverse trucking shipments if Philadelphia, not New York/New Jersey becomes the first port of call for food imports from South America; and
- Unwillingness to acknowledge that any benefits would be shared world-wide while costs would be the responsibility of the U.S. taxpayer.

There is, of course, a second major determinant of a project's economic viability -- project costs. We expect that if all of the environmental issues we discuss in our companion report are adequately addressed, project costs will almost certainly be greater than the current estimate. Our conclusions here, based entirely on benefits, are strongly reinforced by this probable event.

Delaware River Deepening – Dumped Again

Environmental Threats Too Great to Sustain

Released: March 2007



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For over a decade, the U.S. Army Corps of Engineers has tried to convince the public that deepening the main channel of the Delaware River to 45 feet is in the public interest and does not threaten the Delaware River ecosystem. Since completion of its Environmental Impact Statement for the project in 1997 state, federal and regional agencies and experts have brought forth new science, new questions and new concerns that increasingly demonstrate the depth and breadth of the threat the Delaware River deepening project poses to our region. Army Corps environmental data is at odds with the findings of other scientists and in some instances has been carefully finessed to cover up threats to waterway and ecosystem health. In its justifications for the project the Army Corps fails to consider major concerns, questions and information, and threats raised by agencies, experts, scientists and citizens responding with either no information, no strategy or simply an after-the-fact monitoring solution.

This paper, an environmental analysis of a few of the most recent environmental threats to rise to the surface, is part three of a three part report that explores the most important unresolved issues. Part one presents the basic case for opposing further consideration of the Delaware River project and summarizes the conclusions of parts two and three. Part two addresses the economic disparities and misrepresentations used to justify the project.

This report was authored by Maya K. van Rossum, the Delaware Riverkeeper with assistance from David R. Conrad, Senior Water Resource Specialist with the National Wildlife Federation and Capt. Robert V. Martin, retired Naval Aviator with a B.S. from the State University of New York, an M.S. from the University of Pennsylvania, and extensive graduate work at the University of Delaware, plus many years interest in marine ecology.

Executive Summary

The Army Corps of Engineers (the “Army Corps”) continues to assert that all environmental concerns related to the Delaware River Deepening project have been addressed; this simply is not the case. The environmental and community threats associated with deepening the Delaware River’s main navigation channel are well-documented and varied. The concerns raised are not those of an uneducated few as project supporters suggest, they are significant questions raised by data, by experts and by regulatory representatives.

The Army Corps continues to press for the deepening project despite the fact that they no longer have any viable dredge spoil disposal plan and therefore cannot document, discuss or represent the environmental ramifications of needed spoil disposal or the cost implications of spoil disposal. This is no small matter when one considers that the project will generate 26,012,000 cubic yards of spoils with the initial deepening including approximately 77,000 cubic yards of rock, as well as an increase in annual maintenance spoils of 862,000 cubic yards per year, bringing the total to 4,317,000 cubic yards per year for disposal (up from the current 3,455,000 cy/yr).⁷⁵

There continue to be significant and varied toxic threats posed by the Delaware deepening project – specifically the introduction and reintroduction of heavy metals, pesticides and other toxins into the river, water supplies, food chain and/or wildlife.

The Delaware deepening project threatens irreparable harm to a variety of species of fish, shellfish and wildlife including ecologically and economically important species such as horseshoe crabs, oysters, shortnose sturgeon, sportfish, Red Knot *rufa*, peregrine falcon and bald eagle.

The implications of channel deepening for exacerbating the harms threatened by sea level rise are growing as more information is learned and released. And in the wake of the recent Athos I oil spill the reality that the Delaware deepening project may in fact increase the risk of harm from such catastrophes is a sobering concern.

The breadth of environmental threats posed by this project has played a major role in preventing its forward movement. Needed permits and approvals from the States of Delaware and New Jersey have yet to be granted, a testament to the environmental failings of the project.

This project cannot move forward on environmental issues alone. When coupled with the economic shortcomings of the project there is no foundation for funding, approval or construction of the Delaware River Deepening project.

⁷⁵ “Delaware River Main Channel Deepening Project, Comprehensive Economic Reanalysis Report”, US Army Corps of Engineers, Philadelphia District, December 2002 ,p 5

Environmental Threats and Harms- vast & varied

I. Dredge spoil disposal remains an unknown threat to the Delaware Estuary and its ecosystems.

Unknown disposal plan means unknown environmental impacts.

The Army Corps cannot provide an honest assessment of the environmental harms posed by its dredge spoil disposal plan because it no longer has a viable disposal plan for the project. To date the Army Corps continues to assert that its primary method of dredge spoil disposal is on land in confined disposal facilities. The original on land disposal plan consisted of storage in 8 existing confined disposal facilities (CDFs) as well as 4 new ones to be acquired by the Delaware River Port Authority (DRPA). This plan is no longer viable.

Since its 1997 Supplemental Environmental Impact Statement (SEIS) assessing the environmental impacts of the project, Site 17G, one of the 4 new sites, was purchased and developed by Gloucester County as River Winds, a planned residential and business community development. In 2002 the Army Corps revised its disposal plan to rely on disposal in 6 existing disposal facilities as well as three new ones to be acquired by the DRPA.⁷⁶ Since that time the Gloucester County Improvement Authority has acquired 1 of the 3 “new” sites in the Army Corps plan, site 15D, and is currently transforming it into a county park.⁷⁷ As a result, the Army Corps no longer has a viable, articulated or environmentally assessed disposal plan for the Deepening project.

So, while the Army Corps continues to assert that there are no environmental impacts associated with upland disposal or alternative dredge spoil disposal from the project, the reality is that they really can make no claims regarding environmental threats from disposal because they do not now know where the final array of disposal sites will be located. The Army Corps failed to consider an array of disposal options and therefore, has no information to assert a claim of no impact and does not have the information necessary to comply with the requirements of NEPA.⁷⁸

⁷⁶ “Delaware River Main Channel Deepening Project, Comprehensive Economic Reanalysis Report”, US Army Corps of Engineers, Philadelphia District, December 2002

⁷⁷ Correspondence from George D. Strachan, Gloucester County Improvement Authority to the Delaware Riverkeeper Network, February 20, 2007; Correspondence from Senator/Freeholder Steve Sweeney to Lt. Colonel Brown, Army Corps of Engineers, July 16, 2002. E-mail correspondence from Jim Watson, Gloucester County Improvement Authority to Jeff Stein, Taxpayers for Common Sense, 9/17/01. See also “Glouco eyes land to head off dumping,” South Jersey (Camden) Courier-Post, 5/13/00

⁷⁸ The Army Corps failed to fully consider “the potential impacts associated with the development of new sites for dredged material disposal” in the project EIS. Letter from Robert H. Hargrove, Chief, Strategic Planning and Multi-Media Programs Branch, US EPA Region II, to Mr. Robert Callageri, Army Corps of Engineers/Philadelphia District, June 30, 1999

Recent assertions by the Commonwealth of Pennsylvania that it will accept up to 75% of the spoils from the Deepening project are not realistic or likely. The claim is that the dredge spoils can be placed in abandoned mines as part of a “restoration” effort. The truth is, disposal of dredge spoils in the Pennsylvania mines will cost hundreds of millions of dollars in transportation costs, and would significantly alter the benefit-cost analysis for the Deepening project. If this disposal strategy were pursued the benefit-cost ratio would no longer support federal funding of the project.⁷⁹ Regardless of where final funding were to come from for such an option, this cost is a project cost which must be included in any project benefit-cost analysis. The Army Corps has in fact studied this option and rejected it as too costly. Pursuing this option also would require an updated Environmental Impact Statement (EIS) (required regardless at this point) as well as federal and state permitting before it could move forward. Pennsylvania is not in a position to be making these kinds of promises for the Deepening project.

Whatever the new dredge spoil disposal strategy for the Deepening project, it will bring with it significant costs that will have an impact on the benefit-cost ratio for the project. These costs will include both the physical act of transport and disposal as well as responding to, addressing and preventing any environmental risks associated with the disposal option chosen. All of these actions require analysis pursuant to National Environmental Policy Act (NEPA) as well as any applicable state and federal permit and approval programs.

Dredge spoil disposal raises toxic threats.

The material to be dredged from the Delaware River contains toxins which threaten water quality and wildlife. Such contaminants can be reintroduced into the environment through a number of pathways.

Confined disposal facilities, the primary disposal method currently proposed by the Army Corps, can be a significant source of toxic pollution for the Delaware River during the dewatering process. Money Island and Fort Mifflin, two existing dredge spoil disposal facilities, have been found to discharge Cadmium, Lead, Copper, Zinc and total suspended solids into the Delaware River at significant levels.⁸⁰ These two disposal facilities were found to be the eighth largest discharger to the estuary and in the case of lead to discharge more lead than all the other 78 point source

⁷⁹ See Letter to Congressman Andrews from Army Corps of Engineers dated March 2, 2000; Army Corps of Engineers “Proposed Scenario Placement of Dredge Material Pennsylvania Strip Mines,” February 2000; Draft Final Report prepared by The Greeley-Polhemus Group, Inc. for the Army Corps of Engineers titled “Draft final report: Business Plan for Non-Federal Sponsor Cost of the Delaware River Main Channel Deepening Project” October 1996; Army Corps documents dated January 18, 2000 and February 22, 2000; Delaware River Port Authority, “Strategies for Identifying and Implementing Beneficial Uses for Dredge Material from Delaware River Main Channel Deepening Project” February 28, 2000, Prepared by The Greeley-Polhemus Group, Inc for the US Army Corps of Engineers Preliminary Draft, Working Document, DRPA Business Plan for Regional Local Sponsor Cost-Sharing of the Delaware River Main Channel Deepening Project, December 22, 1995, p V

⁸⁰ Dr. Tom Fikslin, Delaware River Basin Commission, presented to the Toxic Advisory Committee November 4, 1998

dischargers to the estuary combined.⁸¹ According to one expert: "CDFs have the potential to impact aquatic life through acute and chronic toxicity, and human health through the bioaccumulation of organic compounds such as PCBs and DDX."⁸²

Historically the Army Corps has represented that according to their data, levels of toxins in River bottom sediments are not high enough to pose any adverse environmental impact. Yet numerous experts and agencies have raised questions about the accuracy of the Army Corps' sediment and water quality claims.

- The University of Delaware's Sea Grant Program states: the "Corps' heavy metal and pesticide data disagree with ADL [Arthur D Little] data by 800% to 2800% for similar parts of the river" -- ADL values being higher, and that Corps conclusions are "doubtful" because Corps data "is often lacking many of the details, or appropriate references, as provided by ADL..."⁸³
- Delaware Department of Natural Resources and Environmental Control staff have found: the Army Corps' data showed that among areas to be dredged (especially the bends to be widened) there are toxic "hot spots". According to Greene's studies, the Corps improperly used mean values (averages) to assess the level of toxics in River sediments. The result was that toxic "hot spots" were hidden in the numbers. Toxics found at levels indicating possible to probable impacts include: Antimony, Arsenic, Copper, Lead, Mercury and Zinc.⁸⁴
- Delaware officials have said: "The concern regarding water quality impacts from dredging at the point of excavation is valid upstream of approximately the C&D Canal."⁸⁵
- Delaware points out that the Army Corps' assertions of toxic safety depend upon assumptions as opposed to facts: "A valid concern remains based on the fact expert judgment and not empirical data was used to create the standard of 250 mg/l of Total Suspended Solids (TSS) a distance of 200 feet from the point of excavation.... A valid concern remains because it is unknown whether the proposed TSS standard can actually be met..."⁸⁶

⁸¹ Dr. Tom Fikslin, Delaware River Basin Commission, presented to the Toxic Advisory Committee November 4, 1998

⁸² Dr. Tom Fikslin, Delaware River Basin Commission, presented to the Toxic Advisory Committee November 4, 1998

⁸³ "Sedimentary Impact of Dredging the Delaware Estuary: Geochemical Impacts and Natural Radionuclide Transfers, A White Paper Report", by Najid Hussain and Thomas M. Church, Graduate College of Marines Studies, University of Delaware, Newark, DE, December 16, 1998

⁸⁴ Rick Greene, DNREC, "Independent Review of Impacts Delaware River Channel Deepening" presented to the DRBC Toxics Advisory Committee November 4, 1998

⁸⁵ State of Delaware, DNREC, Hearing Officer's Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003

⁸⁶ State of Delaware, DNREC, Hearing Officer's Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003

- The Army Corps continues to leave open the option of using the practice of economic loading during dredging operations. “During Economic Loading, dredge hoppers and scows are commonly filled past the point of overflow to increase the load. Overflow with hopper dredges and scows is beneficial when sand is the predominant material because the settling velocity is high enough for the sand to rapidly settle in the hopper during the short filling time.”⁸⁷ Should the Army Corps of Engineers opt to use economic loading, the procedure would allow sediment-laden water to overflow from dredge barges directly into the Delaware River.⁸⁸ “Economic loading of dredged material above the C&D Canal will result in unknown toxic mobilization and dispersion impacts similar to mechanical dredging, which has not been studied or modeled ...”⁸⁹ The environmental ramifications of this approach needs review, consideration and inclusion in project analysis and EIS documentation

The information available about dredge spoils associated with the deepening, coupled with a lack of information about what is to be dredged and where it is to be disposed of, reinforces concerns that dredge spoils pose a contamination threat for wildlife. “...the Service [US Fish & Wildlife Service] cannot dismiss concerns regarding the possible exposure of wildlife to hazardous toxicant concentrations, because reliable estimates of the toxicant concentrations in the dredged material remain unknown. Such estimates depend upon (1) the volume of bend material to be dredged relative to the volume of main channel material to be dredged and (2) the delegation of dredged material from specific areas to certain CDFs.”⁹⁰ This is of ever greater concern given the fact that the Army Corps plans to develop CDFs in a manner that would attract waterfowl to the sites as part of its habitat loss mitigation activities. The Army Corps is unable to respond to this USF&WS concern, and to respond accurately to their requests for information because the Army Corps does not have a viable disposal plan and simply does not know what spoils from what reach of the River will be delivered where.

The University of Delaware’s Sea Grant Program has expressed concern about the leaching of heavy metals from confined disposal facilities to aquifers below. Noting that in much of the regional groundwaters of the Delmarva peninsula “...concentrations of several heavy metals...are very close to the EPA’s [Environmental Protection Agency] potable water limits,” the authors point out that metals reaching groundwater from disposal sites (by leaching action of acid

⁸⁷ Technical Report DRP-90-1. Practices and Procedures Associated with Economic Loading and Overflow of Dredge Hoppers and Scows. Environmental Laboratory, U.S. Army Corps of Engineers, Vicksburg, Mississippi, Oct. 1990

⁸⁸ US General Accounting Office, Delaware River Deepening Project, Comprehensive Reanalysis Needed, GAO-02-604, June 2002, p 22

⁸⁹ State of Delaware, DNREC, Hearing Officer’s Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003

⁹⁰ Letter from Clifford G. Day, Supervisor, USF&WS NJ Office to Robert L. Callegari, US Army Corps of Engineers, June 8, 1999

rain or from oxidized sulfide in the spoils themselves) "can potentially make...concentrations in shallow groundwaters exceed limits."⁹¹ The Army Corps' primary response to such concerns is to conduct monitoring. Identifying contamination after water supplies have been contaminated is not a socially acceptable response to such a potentially significant public threat.

The deepening threatens the Bald Eagle and Peregrine Falcon.

Private channel deepening would be necessary if oil refining facilities, primary beneficiaries of the project, are to take advantage of a deepened main channel. The US Fish and Wildlife Service has expressed concerns about the dredging of private channels and berths on Bald Eagles as the result of toxic contaminants being reintroduced into the water column and food chain.⁹² EPA has questioned whether the Army Corps considered sufficiently the environmental impacts of private channel deepening and spoil disposal -- "... impacts related to the dredging of the private facilities .. and several port facilities owned or operated by the local sponsors, and potential impacts associated with the development of new sites for dredged material disposal were not fully evaluated in the original EIS. Accordingly, these activities will have to be evaluated under NEPA."⁹³ To the extent the Army Corps did do sampling of sediments in the private channels it did not include sampling at Motiva (a facility that was included in the 2002 economic benefits calculation of the project). The sampling that was done found that sediments contained a variety of toxins and metals such as PCBs, DDE and pesticides including DDD, DDT and Endrin. In addition, while the Corps provides multiple explanations and dismissals of the findings, the SEIS did find that NJDEP residential soil clean up criteria were exceeded for Cadmium, Thallium, Ideno (123-cd) pyrene, 2,4-Dinitro toluene, and N-nitrosodi-n-propylamine.⁹⁴ The Army Corps' dismisses these findings by saying they are at levels comparable to what was found in the main channel and that the sediments would be disposed of on land – but as we have discussed the Army Corps data and credibility on such issues are suspect. The Army Corps has clearly not addressed the potential environmental ramifications of dredging the private channels, including upland disposal of contaminated sediments.

In July of 2003, the US Fish and Wildlife Service began expressing concerns about the impacts of the deepening project on Bald Eagle and Peregrine Falcon. "In a letter to the Philadelphia District dated January 18, 1996, the Service concluded that the Delaware River Main Channel Deepening was not likely to

⁹¹ "Sedimentary Impact of Dredging the Delaware Estuary: Geochemical Impacts and Natural Radionuclide Transfers, A White Paper Report", by Najid Hussain and Thomas M. Church, Graduate College of Marines Studies, University of Delaware, Newark, DE, December 16, 1998

⁹² Letter from US Fish and Wildlife Service to the Army Corps of Engineers Philadelphia District, February 6, 2003

⁹³ Letter from Robert H. Hargrove, Chief, Strategic Planning and Multi-Media Programs Branch, US EPA Region II, to Mr. Robert Callageri, Army Corps of Engineers/Philadelphia District, June 30, 1999

⁹⁴ See Delaware River Main Channel Deepening Project, Supplemental Environmental Impact Statement, July 1997, p 4-52 thru 4-77

adversely affect the bald eagle or peregrine falcon (*Falco peregrinus*). ... the Service has acquired new information on the contaminants in the Delaware River, suggesting that the previous not likely to adversely affect determination may no longer be appropriate."⁹⁵

II. Even if there were no contaminants, the dredging activities would cause major disruptions and threats to aquatic wildlife.

The deepening threatens horseshoe crabs, oysters and migratory shorebirds already on the brink of extinction ...

The Army Corps' current project plans fail to provide or economically account for biological windows necessary to protect critical species in the Delaware Estuary including, horseshoe crab, winter flounder and blue crab. While a number of environmental windows were identified in the 1997 Final Supplemental Environmental Impact Statement, several key issues were deferred to subsequent planning, and other significant new issues have arisen since then. The Corps has admitted it must violate biological windows in order to proceed with the Deepening project. The full environmental ramifications of such violations and waivers are yet to be evaluated.⁹⁶

Disposal of dredge spoils from the project poses a threat to horseshoe crabs. Delaware Bay is home to the world's largest population of horseshoe crabs. As a result, each year the Delaware Bay is also host to the second largest population of migrating shorebirds in North America. Birds including sanderlings, sandpipers, ruddy turnstones and others arrive from South America to this area in late May and use it as resting and feeding grounds.

Among the migrating shorebirds is the Red Knot *rufa* that each year migrates up to 30,000 kilometers from wintering grounds in South America to breeding grounds in the Arctic. On this journey the birds will fly as far as 4,000 miles nonstop. Their migration includes just a few critically timed and selected rest stops – the Delaware Bay is one of the most important. When the Red Knot *rufa* arrive at the Delaware Bay they are literally starving – they have used up their body fat, some of their lean body mass, and even their organs are shrunken in size. They come to the bayshore to rest and feast on horseshoe crab eggs, historically available in great abundance. They must eat enough eggs to double their body weight in a matter of about three weeks so they can successfully embark on the final nonstop leg of their journey. There is a multi-million dollar ecotourism industry that has evolved around the dramatic arrival and feasting of the migrating shorebirds.

⁹⁵ Letter from US Fish and Wildlife Service to the Army Corps of Engineers Philadelphia District, July 31, 2003

⁹⁶ Corps of Engineers Responses to Exhibits/Transcript Submitted in DNREC's Letter Dated December 21, 2001 To Corps of Engineers, at p 277; additional detail on this issue can be found in Delaware River Deepening Project: Outstanding Environmental And Community Issues, Delaware Riverkeeper Network & National Wildlife Federation, August 9, 2002

Independent studies show that the number of Red Knot *rufa* observed in the Delaware Bay stopover has steadily declined from over 100,000 in the 1980s to 43,000 in 2000 to just 15,300 in the year 2005. Experts have predicted the Red Knot *rufa* may go extinct by the year 2010 under current conditions.⁹⁷ The decline in the Red Knot *rufa* is directly related to the decline in horseshoe crabs and available eggs in Delaware Bay. Protection of the horseshoe crabs of Delaware Bay from any threats to their populations must be provided at all costs – for the benefit of the crabs, the Red Knot, the dependent ecotourism industry, and the biomedical industry that requires the horseshoe crab blood for Food and Drug Administration-required testing on a variety of vaccines, medical devices and prosthetics. The hard work already completed by New Jersey and Delaware to protect and enhance the populations of these important species would be jeopardized by the Delaware Deepening project.

The US Fish and Wildlife Service has noted that additional NEPA documentation is necessary in order for the agency to make a determination on proposals to place dredge materials at Kelly Island, and Port Mahon and Broadkill Beach.⁹⁸ The US Fish and Wildlife Service has expressed concern about the potential of the Corps' proposed beach nourishment projects to kill one to two year-classes of juvenile horseshoe crabs during initial construction and during each renourishment period. Biologists have expressed concern that smothering even one generation of juvenile horseshoe crabs could further threaten the sustainable population.⁹⁹

The Army Corps' primary response to concerns expressed regarding impacts to oysters has been to conduct monitoring pre and post the deepening project to determine after the fact if any adverse environmental impacts occurred as a result of the deepening. With regard to the pre-project monitoring that was done, the USF&WS noted that "environmental contaminants were not a component of the study. ... The Service remains concerned that dredging activities in the Delaware River may result in the release of buried contaminants from localized 'hot spots.' Baseline body burden levels need to be established for representative groups (oysters, dominant fish species) prior to any dredging

⁹⁷ For additional detail and references see Delaware Riverkeeper Network's petition to the US Fish & Wildlife Service to have the Red Knot *rufa* declared an endangered species.

⁹⁸ Note: Port Mahon seems to have been taken out of the Army Corps current disposal plans for the Deepening project

⁹⁹ Letter of Clifford G. Day, New Jersey Field Office, U.S. Fish and Wildlife Service to John Brady, U.S. Army Corps of Engineers, Philadelphia District, November 14, 2001, and personal communication by David Conrad, National Wildlife Federation with NJFO fisheries biologists, December, 2001. These concerns were also raised in testimony of National Wildlife Federation and other members of the Alliance to Stop the Delaware Deepening at the December 4, 2001, hearings conducted by DNREC and in further written testimony of December 20, 2001 on the Corps Subaqueous Lands permit application for the Main Channel Deepening; additional detail on this issue can be found in Delaware River Deepening Project: Outstanding Environmental And Community Issues, Delaware Riverkeeper Network & National Wildlife Federation, August 9, 2002

activities.”¹⁰⁰ As with the monitoring for groundwater contamination, after the fact monitoring that does not prevent the potential threat and will not result in protection of the resource is not protective of the community.

A June 2005 Army Corp document, Pre-Construction, Horseshoe Crab Monitoring; Egg Island, New Jersey and Kelly Island, Delaware Wetland Restoration Areas prepared by Versar, Inc. does not lay to rest the concerns for impacts to horseshoe crabs. There is no indication on the record that this report was ever reviewed or commented on by the US Fish & Wildlife Service and it does not include the Broadkill Beach site. The report acknowledges that it will violate the April 15 to August 31 biological window on shoreline construction projects for protection of horseshoe crabs to carry out beneficial reuse projects at these sites: “Given operational and scheduling constraints, the reconstruction projects for Egg Island and Kelly Island may be jeopardized if they are held to the restricted interval in its entirety. ... The reconstruction of Egg and Kelly Island will likely span over a year, and therefore overlap with time of spawning for horseshoe crabs. Once the construction project is initiated, it must be carried on until completion.... By this circumstance, impacts to horseshoe crabs will be unavoidable for at least one spawning season.”¹⁰¹ The rationale for this impact is that while the impact to the horseshoe crabs is “unavoidable” the benefits are overriding. But this does not mesh in light of the USF&WS concern that the replenishment project will require renourishment after initial construction, the concern of experts that smothering even one generation of juvenile horseshoe crabs could further threaten a sustainable crab population. Any interruption of the crab spawning will also negatively impact the single most important food supply for the seriously diminished numbers of migrant Red Knot. Without an abundant supply of crab eggs, the Red Knot will become further diminished and may even go extinct. The critical ecological role that horseshoe crabs play in the Delaware Bay ecosystem and businesses¹⁰² cannot be overestimated. Questions that we believe remain outstanding from this report include: how often will renourishment be required and what will be the impacts individually and cumulatively of renourishment activities; what sand sources and types will be used for subsequent renourishment; what will be done to prevent re-erosion of these areas after construction as compared to pre-construction and at what rate

¹⁰⁰ Correspondence from John C. Staples, USF&WS, NJ Field Office, to John Brady, US Army Corps of Engineers, October 3, 2001

¹⁰¹ Versar Inc. for the Army Corps of Engineers, Pre-Construction, Horseshoe Crab Monitoring; Egg Island, New Jersey and Kelly Island, Delaware Wetland Restoration Areas, June 2005

¹⁰² Letter of Clifford G. Day, New Jersey Field Office, U.S. Fish and Wildlife Service to John Brady, U.S. Army Corps of Engineers, Philadelphia District, November 14, 2001, and personal communication by David Conrad, National Wildlife Federation with NJFO fisheries biologists, December, 2001. These concerns were also raised in testimony of National Wildlife Federation and other members of the Alliance to Stop the Delaware Deepening at the December 4, 2001, hearings conducted by DNREC and in further written testimony of December 20, 2001 on the Corps Subaqueous Lands permit application for the Main Channel Deepening; additional detail on this issue can be found in Delaware River Deepening Project: Outstanding Environmental And Community Issues, Delaware Riverkeeper Network & National Wildlife Federation, August 9, 2002

would new erosion occur (i.e. at a rate that increases the level of renourishment required); what information is there to indicate (other than use of other nearby beaches) that the lesser used areas by horseshoe crabs identified on Kelly Island will be put to greater use after construction, are there are other limiting factors at work yet to be considered; how can the Army Corps claim the Kelly Island project as part of their dredge spoil disposal plan when they do not have approval for a waiver of the applicable biological window.

DNREC's hearing officer responsible for reviewing, commenting on, and recommending action on permit application materials has also expressed concerns about the Kelly Island project and dredge spoils placement aspects of the Deepening project to horseshoe crabs and also to oyster beds:¹⁰³

- "The local horseshoe crab population (and thereby indirectly shorebirds) will be directly and adversely impacted should the protective window be suspended for project construction. This issue ... is unavoidable if the project is approved as currently proposed."
- "... the project has the potential to cause secondary adverse impacts to nearby oyster beds from sedimentation..."
- "I find that the project as proposed will result in unavoidable direct adverse impact to site horseshoe crab populations during construction and unavoidable potential secondary impacts to nearby oyster beds."

In an often expressed concern that the Army Corps has been pursuing the Deepening project with a set of pre-determined findings and outcomes, USF&WS wrote about the Army Corps' oyster monitoring report: "The Service also recommends modifying the statement presented in the Summary and Conclusions section of the Versar, Incorporated, report (Page 4.1). The concluding paragraph reads: 'it is intended that these data could then be used to direct any mitigation that may be required in the *unlikely* (emphasis added) event that significant impacts are detected by the post-construction monitoring.' As written, the statement appears pre-determining."¹⁰⁴

The deepening threatens Sabellaria vulgaris and the fish dependent upon them for food, shelter, spawning and nursery habitat ...

Sabellaria vulgaris are polychaetous annelid worms that construct colonies of sand tube reefs, which, in general, meet the criteria of Essential Fish Habitat under the federal Magnuson-Stevens Act. The reefs provide intricate habitat for a number of small crustaceans and minute species that are key parts of the aquatic food chain, as predators for plankton and prey for fish. The colonies are feeding, hiding, spawning, and nursery areas for a large number of sportfish including black sea bass, summer flounder, scup, weakfish, black drum, and

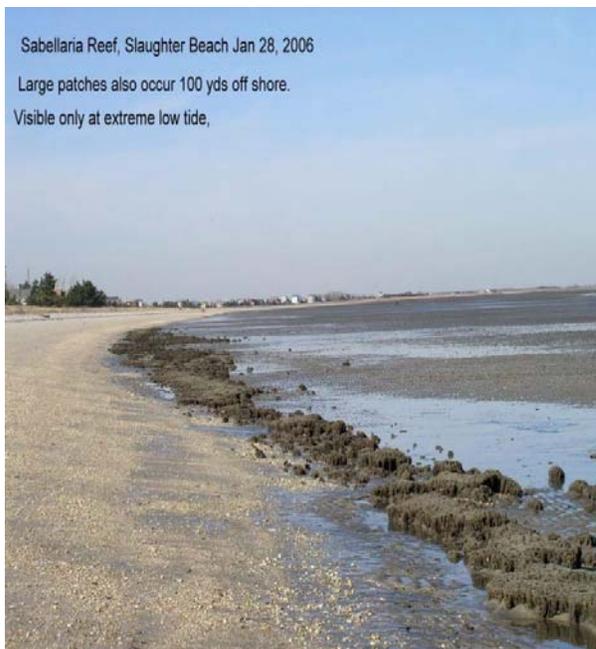
¹⁰³ State of Delaware, DNREC, Hearing Officer's Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003, p 44

¹⁰⁴ Correspondence from John C. Staples, USF&WS, NJ Field Office, to John Brady, US Army Corps of Engineers, October 3, 2001

others. Sportsmen may find that their sportfishing opportunities would significantly diminish if these reefs were eliminated.

Sabellaria reefs can provide a degree of protection from the effects of wave action, stabilizing beach sands and intercepting the force of waves near the low tide mark.¹⁰⁵ Delaware Bay *Sabellaria* reefs are of considerable geological importance and should be considered in the analysis of factors influencing sedimentation on beaches.¹⁰⁶ “While the species ranges from Cape Cod to Georgia (Gosner, 1978), the formation of reef structures seems unique to Delaware Bay....”¹⁰⁷

As a result of the deepening project “[t]here is a reasonable expectation of unacceptable harm to *Sabellaria* colonies. Harm to these colonies will result in unknown secondary biotic impacts to interrelated organisms.”¹⁰⁸ According to Delaware’s Hearing Officer: “... the Corps initially overlooked *Sabellaria* impact and that studies conducted and proposed to date have not demonstrated the project as proposed will minimize or avoid harm to long-term *Sabellaria* populations at Broadkill Beach and Port Mahon.”¹⁰⁹



Picture taken by Robert V. Martin

¹⁰⁵ Wells, H.W. 1970

¹⁰⁶ Wells, H.W. 1970

¹⁰⁷ Dr. Douglas Miller, Pre construction *Sabellaria Vulgaris* Baseline Monitoring at Broadkill Beach Sand Placement Site, Sussex County, Delaware, Revision Jan. 3, 2002

¹⁰⁸ State of Delaware, DNREC, Hearing Officer’s Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003, p 81

¹⁰⁹ State of Delaware, DNREC, Hearing Officer’s Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003, p 81

Sabellaria vulgaris require water flow and wave action to provide food, oxygen and sand grains needed for tube building. “While they have some capability to withstand burial under thick layers of sand, shoreline restoration would be expected to bury the present reefs at Broadkill Beach resulting in a substantial loss of this habitat.”¹¹⁰ The Army Corps’ report regarding this species found that activities associated with the Deepening could adversely impact the *Sabellaria vulgaris* and identified 3 mitigation options, but no supporting data or research are cited in support of the untested mitigation actions. In addition, the cost of these plans has not been included in the cost of the deepening project.¹¹¹

The responsive study by Dr. Gary F. Smith, Subtidal Pre-Construction *Sabellaria vulgaris* Monitoring in Delaware Bay at Broadkill Beach and Port Mahon Sand Placement Sites, and Kelly Island and Slaughter Beach Control Sites, Draft Report¹¹² does not address outstanding concerns. Dr. Smith’s study focused on off-shore occurrences of *Sabellaria* and therefore does not bear direct relevance to the proposal to conduct beach reconstruction on Kelly Island and at Port Mahon. Dr. Smith’s study discusses bottom substrate conducive to *Sabellaria* – this can be misleading as the worm does not always require a specific type of bottom, only some hard surface such as oyster shells, clam shells, scattered gravel etc upon which to build. Once the *Sabellaria* has started to build it can continue to build upon its own structure as long as it is left undisturbed. And there is a question whether the benthic raking conducted as part of Dr. Smith’s survey actually degraded *Sabellaria* colonization or reef development.

There are numerous patches, colonies and reefs of *Sabellaria vulgaris* located in the intertidal zone of Broadkill Beach, Slaughter Beach and Port Mahon. These colonies will be threatened and smothered if nearby beach replenishment were to take place. Because these colonies are identified as Essential Fish Habitat under the Magnusen-Stevens Act an extensive EIS would be required for such projects to proceed.

The Broadkill Beach *Sabellaria* colonies and reef were covered in the spring of 2005 by a replenishment effort of over 100,000 cubic yards of sand dredged from a nearby shore source. A large portion of the *Sabellaria* colonies and reef were lost as a result of this replenishment effort.

¹¹⁰ Dr. Douglas Miller, *Pre construction Sabellaria Vulgaris Baseline Monitoring at Broadkill Beach Sand Placement Site, Sussex County, Delaware, Revision January 3, 2002.*

¹¹¹ *Additional detail on this issue can be found in Delaware River Deepening Project: Outstanding Environmental And Community Issues, Delaware Riverkeeper Network & National Wildlife Federation, August 9, 2002*

¹¹² *Sub-Contract Number 003951, April 2005*



Jan 28, 2006 Broadkill Beach Sabellaria vulgaris Reef destroyed

Compare to photos Of 2003

This is what remains afte replenishment in inter-tidal zone

Massive replenishment made during the Spring of 2005



Photos Taken by R. V. Martin. Left photos is Broadkill Beach April 6, 2003 covered with extensive Sabellaria reef. Right photo is Broadkill Beach January 28, 2006 and shows the great loss of Sabellaria reef caused by beach replenishment. The reefs shown in the 1/28/06 photos were crushed by the weight of bulldozers moving sand and the weight of the sand itself.

Diopatra cuprea is a partner in beach preservation. The *Diopatra cuprea* is an annelida polychaeta worm which can grow to 30 cm long and 10 mm wide. and lives in the hard packed flats of the near shore of the State of Delaware's Delaware River shores. Thousands of their protruding 30 to 60 mm tops can be seen at very low tides. These worms, along with the *Sabellaria vulgaris* will be smothered if covered with replenishment sand. These natural beach protectors will be lost if improper measures do not insure their existence. Scientific attention to the Delaware *Diopatra cuprea* flats has been very limited.

The deepening threatens a variety of fish species.

Winter Flounder:

"...Corps has not demonstrated the harm resulting to winter flounder from the subject beach nourishment projects is either avoided or minimized by suspending the protective environmental window."¹¹³

Finfish:

"The potential impact from blasting on historical gas storage caverns has not been adequately addressed. As proposed, it is reasonable to conclude there will be cumulative and secondary impact to the aquatic ecosystem, although this concern may be minimized via permit conditions. As currently proposed the project will adversely harm finfish....."¹¹⁴

Shortnose Sturgeon:

¹¹³ State of Delaware, DNREC, Hearing Officer's Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003, p 81

¹¹⁴ State of Delaware, DNREC, Hearing Officer's Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003

Despite Corps claims to the contrary, studies and data suggest the rock blasting required for the Deepening project could significantly jeopardize the population of federally endangered shortnose sturgeon that live in the Delaware Estuary.¹¹⁵ The State of Delaware's Hearing Officer determined: "...there will be impact to sturgeon resulting from blasting, and the acceptability or potential minimization of impact is not resolved."¹¹⁶ He went on to find: "There is a reasonable expectation of unacceptable harm to shortnose sturgeon, and efforts to minimize this impact remain unresolved."¹¹⁷ The US Fish and Wildlife Service has determined that the "principal threats" to shortnose sturgeon species "survival are mortality resulting from dredging, impingement on the cooling water intake screens, and incidental capture. Secondary threats include habitat degradation or loss by dredging, bridge construction and dams (National Marine Fisheries Service, 1998)." (emphasis added)¹¹⁸

The September 2005 Army Corps commissioned study titled "Delaware River Adult and Juvenile Sturgeon Survey, Winter 2005" does not allay the many legitimate concerns. This study acknowledges that "Little is known regarding the occurrence and distribution of juvenile shortnose sturgeon in the Delaware River." "While blasting in the winter months should protect most fish species that use the Delaware River in the spring and warmer months, Atlantic Sturgeon (*Acipenser oxyrinchus*) and Shortnose Sturgeon (*Acipenser brevirostrum*) may be susceptible to blasting mortality if they use the Marcus Hook area during winter." (*Versar Inc. prepared for the Army Corps of Engineers, Delaware River Adult and Juvenile Sturgeon Survey, Winter 2005, September 2005*) While the study did find more sturgeon located upriver than down, sturgeon were observed near the Marcus Hook area during the winter time frame at issue – the study determined that the relative sturgeon density in the Marcus Hook area was .005 fish per 100 meters thereby suggesting "that sturgeons are more dispersed in the Marcus Hook region of the Delaware River" than upstream. The Versar study included amongst its conclusions "Although the video survey data suggests that large aggregations of sturgeon do not exist in the blasting area, impacts to even a small number of Shortnose or Atlantic Sturgeon may not be acceptable to fisheries agencies."¹¹⁹ It is important to note, that this study was based on one winter's data – this is not a large data set upon which to be making decisions

¹¹⁵ For additional information and detail see Delaware River Deepening Project: Outstanding Environmental And Community Issues, Delaware Riverkeeper Network & National Wildlife Federation, August 9, 2002

¹¹⁶ State of Delaware, DNREC, Hearing Officer's Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003, p 96

¹¹⁷ State of Delaware, DNREC, Hearing Officer's Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003

¹¹⁸ Letter from US Fish and Wildlife Service to the Army Corps of Engineers Philadelphia District, February 6, 2003; Letter from US Fish and Wildlife Service to the Army Corps of Engineers Philadelphia District, February 11, 2003

¹¹⁹ Versar Inc. prepared for the Army Corps of Engineers, Delaware River Adult and Juvenile Sturgeon Survey, Winter 2005, September 2005

regarding activities that could have such large and irreparable impacts to both the Shortnose and Atlantic Sturgeon species in the Delaware River. (The Shortnose Sturgeon is listed as federally endangered and the Atlantic Sturgeon that are not federally listed but are in reality at dangerously low levels.)

While the study discusses concepts for deterring Sturgeon from entering the blasting zone during the critical period, the report concluded “At present, there is no ‘out-of-the box’ behavioral deterrent system for excluding sturgeon from an underwater blasting area.”¹²⁰ Even if deterrence were effective, what impact would excluding the Sturgeon from a part of the River they use have on individuals and the species?

Essential Fish Habitat:

In 1999, the Secretary of Commerce approved several Fishery Management Plans identifying and describing Essential Fish Habitat. The Essential Fish Habitat designations applicable to New Jersey and Delaware were compiled into a document by the National Marine Fisheries Management Council and transmitted to the Army Corps of Engineers with a cover letter stating: “As you can see, several life stages of numerous Federally managed species occur in the Delaware River that are likely to be impacted by this deepening project.”¹²¹ These are issues that were not included in the last SEIS document prepared for the project (dated 1997).

III. A deeper channel could increase the risk that serious spills will occur during normal shipping operations.

A deepened channel will not, as the Army Corps claims, reduce the risk of environmental harm. To the contrary, to the extent there is documentation on this issue, the finding is that a deepened channel could increase the threat of major oil spills and catastrophes on the Delaware River.

“In considering the environmental impact of a deeper main channel, the same number of crude oil tankers would have to be lightered at Big Stone Beach Anchorage, only the amount of crude oil transferred would be reduced. The most environmentally challenging aspect of lightering operations is the activities associated with bringing the barge along side and hooking up and later unhooking the cargo hoses. These activities would not be changed as a result of a deepening main channel.”¹²²

¹²⁰ Versar Inc. prepared for the Army Corps of Engineers, Delaware River Adult and Juvenile Sturgeon Survey, Winter 2005, September 2005

¹²¹ Letter from Daniel T. Furlong, Mid-Atlantic Fishery Management Council, to Mr. Robert L. Callegari, Army Corps of Engineers/Philadelphia District, August 19, 1999

¹²² Report from “Charles Zeien Associates, Naval Architects, Shipping and Ship Building consultants, “Impact on the State of Delaware of a deeper Delaware River Main Channel, March 18, 1998

With a deepened channel ships will come up the Delaware River more heavily laden, if there is another catastrophe like the Athos I of November 26, 2004 (a possibility not unchanged by a deepened channel) the volume of oil available to leak and wreak havoc on the environment and our communities will be greater and therefore more dangerous.

“According to the model, a marginally greater number of hazardous-commodity spills are projected for the deepened channel than for the channel at its current depth. These findings are for the years 1990-2010.”¹²³

IV. Deepening and sea level rise could threaten drinking water supplies, flooding, erosion and more.

Sea level rise in the Delaware Estuary could result in movement of the salt line allowing it to move dangerously close to, or even contaminate, drinking water supplies. Sea level rise could induce shoreline erosion, habitat changes, impacts to wetlands, or flooding during major storm events. And while the Corps has claimed sea level rise will allow it to reduce the costs of the deepening project by reducing the amount of actual dredging (sediment removal) it has to undertake, it has not fairly assessed the threats sea level rise poses.

Regarding movement of the salt line and associated impacts, while the Army Corps only considered what impact a deepened channel would have in movement of the salt line, they have not analyzed the combination of a deepened channel along with sea level rise. In the 1997 Supplemental Environmental Impact Statement the impact of the deepening coupled with the impact of sea level rise was identified as an issue in need of analysis and consideration. The concern identified was primarily related to impacts on salinity levels in the Estuary – will the deepening coupled with sea level rise move the salt line up the River far enough to threaten drinking water supplies?

The other threats brought to the region by sea level rise, such as erosion, flooding and habitat loss have also been ignored by the Army Corps studies. Despite the recognition of the importance of this issue the Army Corps has failed to adequately analyze the impacts of sea level rise. During the 1961 to 1966 drought, the “salt front ... moved 50 km inland and salt water recharged the Potomac-Raritan-Magothy aquifer.... Chloride levels remained elevated for more than 10 years.”¹²⁴ The Corps’ SEIS used a model that was unable to analyze

¹²³ Jack Faucett Associates for the Delaware Estuary Program, Projected Vessel Casualties and Hazardous Spills in the Delaware River and Delaware Bay With and Without Channel Deepening, 1990-2010, April 1993

¹²⁴ Cooper, Beevers & Oppenheimer, Science, Technology and Environmental Policy Program, Woodrow Wilson School of Public and International Affairs, Future Sea Level Rise and the New Jersey Coast, Assessing Potential Impacts and Opportunities, November 2005

the impacts of sea level rise coupled with the deepening.¹²⁵ In addition to the model limitations the Army Corps used only a 1 foot rise in sea level as one of their base assumptions. A 2005 study determined that for New Jersey the median projection for sea level rise is actually 0.61 m or 2 feet.¹²⁶

Sea level rise brings with it serious threats to our region – threats that could be exacerbated by a deepened channel.

V. As a result of unaddressed environmental issues, the Corps has not been able to obtain all of the necessary permits and concurrences that will be required before this project can be commenced.

The breadth of environment and economic issues for this project are so vast that the project continues to be unable to secure the permits, approvals, funding and support it needs to move forward.

The Army Corps has not been able to secure the Subaqueous Land Permit from the State of Delaware it needs for the Deepening project. A December 2003 report from the permit hearing officer recommended denial of the permit and states that additional data/information is needed. (“I find the Corps has failed to provide sufficient and necessary information to meet the regulatory burden to obtain a permit under the authority of Chapter 66, as potential adverse effects have not been proven to be minimized.”¹²⁷) In addition, the Delaware Consistency Determination was conditional on the Army Corps addressing a large variety of issues including meeting state permit obligations. Not all conditions have been met. For example, because of its failure to have a final disposal plan for the project the Army Corps cannot meet the requirement that it “identify and describe in detail the functions of all confined disposal facilities to be used for the project – whether located within the land area of the State of Delaware or discharging into Delaware waters”; and the Army Corps still has not made a firm commitment to comply with recommended dredging windows established by the Delaware River Basin Fish and Wildlife Cooperative.¹²⁸

The project is in need of a new New Jersey Federal Coastal Zone Consistency Determination. The NJ Consistency determination issued in 1997 for the project was revoked in a letter dated September 30, 2002, in which NJDEP

¹²⁵ “Results from the simulation of a 1.0 foot sea level rise combined with channel deepening are ambiguous due to a number of limitations.” Delaware River Main Channel Deepening Project SEIS, Army Corps of Engineers, July 1997

¹²⁶ Cooper, Beevers & Oppenheimer, Science, Technology and Environmental Policy Program, Woodrow Wilson School of Public and International Affairs, Future Sea Level Rise and the New Jersey Coast. Assessing Potential Impacts and Opportunities, November 2005

¹²⁷ State of Delaware, DNREC, Hearing Officer’s Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003, p 58

¹²⁸ Letters from Nicholas DiPasquale, Secretary, DNREC to LTC Debra M. Lewis, Army Corps of Engineers, March 31, 2000 and July 14, 2000

Commissioner Bradley Campbell stated he was “revoking” the Department’s “federal coastal zone consistency determination” for the Delaware River Main Channel Deepening Project. This determination of revocation was based on the 5-year time lapse that at that point had occurred (now over 9 years) since issuance of the Determination, on the significant amount of new economic and environmental information that had been received on the project, and on changes taking place with regards to the project. Since revocation, the project has continued to evolve and new information continues to emerge. The Army Corps, based on information from National Oceanic and Atmospheric Administration’s (NOAA) Office of Ocean and Coastal Resource Management, has taken the position that this revocation is not valid. As articulated in a February 21, 2003 letter from Commissioner Bradley Campbell, NJ Department of Environmental Protection, to Mr. David Kaiser, Federal Consistency Coordinator at NOAA, 15 CFR 930.46 provides for “supplemental coordination for a federal agency activity that has not yet begun if the proposed activity will affect any coastal use or resource substantially differently than originally described. Substantially different coastal effects are reasonably foreseeable if the federal agency makes substantial change in the proposed activity that are relevant to management program enforceable policies or if there are significant new circumstances or information relevant to the proposed activity and its effect on any coastal use or resource.” The Deepening project clearly meets the exception provided in 15 CFR 930.46: “The Delaware Deepening project has not yet started and has no date projected to start in the near future. Further, the scope of the project is significantly different from that previously reviewed. Specifically, disposal capacity and locations remain outstanding.”¹²⁹ Even NOAA confirms in its December 19, 2002 letter to NJDEP on this topic that there is an exception for revocation “where the project has not begun and effects are substantially different than previously reviewed.”

¹²⁹ Letter from Commissioner Bradley Campbell, NJDEP, to Mr. David Kaiser, Federal Consistency Coordinator at NOAA, February 21, 2003

Conclusion on the environment...

“The overall net effect on natural resources is adverse and detrimental.”¹³⁰

The Delaware River deepening project poses major threats to our river, region and communities. Heavy metals, pesticides and other toxins could be introduced and reintroduced into the river, water supplies, food chain and/or wildlife. Ecologically and economically important species such as horseshoe crabs, Red Knot *rufa*, peregrine falcon, bald eagle, oysters, shortnose sturgeon, a variety of sportfish and those at the base of the web of life that provide unique food and habitat are put at risk and/or will be harmed if this project moves forward. The threat of oil spills will not go down as project supporters would have you believe but may in fact go up. And the ramifications of sea level rise such as erosion, salt water intrusion into drinking water supplies, shoaling and flooding may also be affected by a deepened channel.

The threats, challenges, questions and concerns regarding this project have been raised by agencies and experts throughout the region. Agencies have pulled back approvals, issued damning reports and denied issuance of needed permits as the result of the growing body of evidence that the harms this project poses to our environment and region are simply too great for our River or region to sustain.

¹³⁰ State of Delaware, DNREC, Hearing Officer's Report, Recommendation to the Secretary, US Army Corps of Engineers Application for Permit Delaware River Main Channel Deepening Project, Timothy Bureau Hearing Officer, December 2003, p 112