

Exhibit A



DEEPWATER TERMINALS: Savannah • Brunswick
BARGE TERMINALS: Bainbridge • Columbus
TRADE DEVELOPMENT OFFICES: Savannah • Brunswick • Atlanta •
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NEWS

For Immediate Release

July 13, 1998

SAVANNAH, GEORGIA U.S.A.— The Georgia Ports Authority (GPA) has refined its plan to deepen the Savannah Harbor Navigation Channel by proposing to give state and federal government environmental agencies veto power over the project if their environmental concerns are not satisfied.

GPA Executive Director Doug J. Marchand said Monday, "We all recognize that the ports authority has the responsibility to provide for the economic development of Georgia and the entire multi-state geographic area which we serve. We also have the responsibility to be the best possible steward of the environment. For that reason, we are proposing what I believe to be an unprecedented plan to allow environmental resource agencies to help shape and to pass judgment on our plan to deepen the Savannah harbor."

The proposal comes as GPA is nearing completion of a study to determine the economic, engineering, and environmental feasibility of deepening the navigation channel. The next phase would be Congressional authorization to proceed with the design of detailed engineering plans that include advanced studies of the impact of the project on wildlife, fish and plant habitats, water quality, and properties adjacent to the navigation channel.

The final phase—construction of the project— can only proceed upon approval of a satisfactory Environmental Impact Statement and after Congress and the State of Georgia approve construction funding.

GPA has also identified the locally preferred plan for project depth. "After discussions with our present steamship line customers and our negotiations with potential new lines concerning the draft needs of the future, it was determined that the optimum draft for Savannah is -48'," Marchand said. "This would accommodate vessels currently planned, provide adequate under-keel clearance, and best suit carrier needs." The initial study used a depth of -50' to assess maximum impacts. The National Economic Development (NED) plan, which considers the highest net federal benefit and determines federal interest in cost-sharing a project, is also established at -48'.

The GPA plan provides the framework for environmental agencies to work with the GPA and the Corps of Engineers through a "stakeholders evaluation group" to identify the scope of the scientific studies which are required to measure any environmental impacts that might occur at various increased depths of the channel. The agencies could prevent further consideration of the project if agreement cannot be reached on the scope of the studies.

In the event studies proceed, the environmental agencies next would review the data the studies produce. When environmental impacts are predicted, the studies will include a proposal to avoid, minimize or mitigate those impacts. The agencies could prevent further consideration of the deepening project if it is determined that the mitigation plan is inadequate.

The GPA proposal is based on a draft initially proposed by the Georgia Department of Natural Resources. The proposal has been discussed with the agencies, and was transmitted to them in revised draft form on Friday. Ports authority representatives will begin meetings with the agencies on Tuesday to review details of the plan. GPA also will ask Members of the Georgia Congressional delegation to include the final version of the plan in the provision of the Water Resources Development Act of 1998 (WRDA 98) that would authorize the Savannah deepening project subject to satisfactory resolution of all environmental concerns.

Marchand said, "We recognize that the public and the state and federal environmental organizations all have legitimate concerns about the impact of any new activities in the sensitive Savannah River basin. We have been working for more than a year to identify and address those concerns and our proposal is insurance to all involved that we are prepared to fully address their concerns. However, we cannot even begin to study their concerns unless the deepening project is included in WRDA 98."

GPA considers increased channel depth to be vital to continued growth of port activities in Savannah. More than half of the container vessels currently calling at the port must either load to less than capacity or wait for high tides in order to safely transit the channel. Because of the trend of steamship companies to increase efficiency by increasing vessel size, it is anticipated that deep draft vessel calls will increase by over 445 percent over the next 50 years.

A 1997 economic impact study estimates that Georgia's public and private terminal operations directly or indirectly support 80,100 jobs, are responsible for \$1.8 billion in wages, generate \$23 billion in revenue and account for \$565 million in state and local taxes each year.

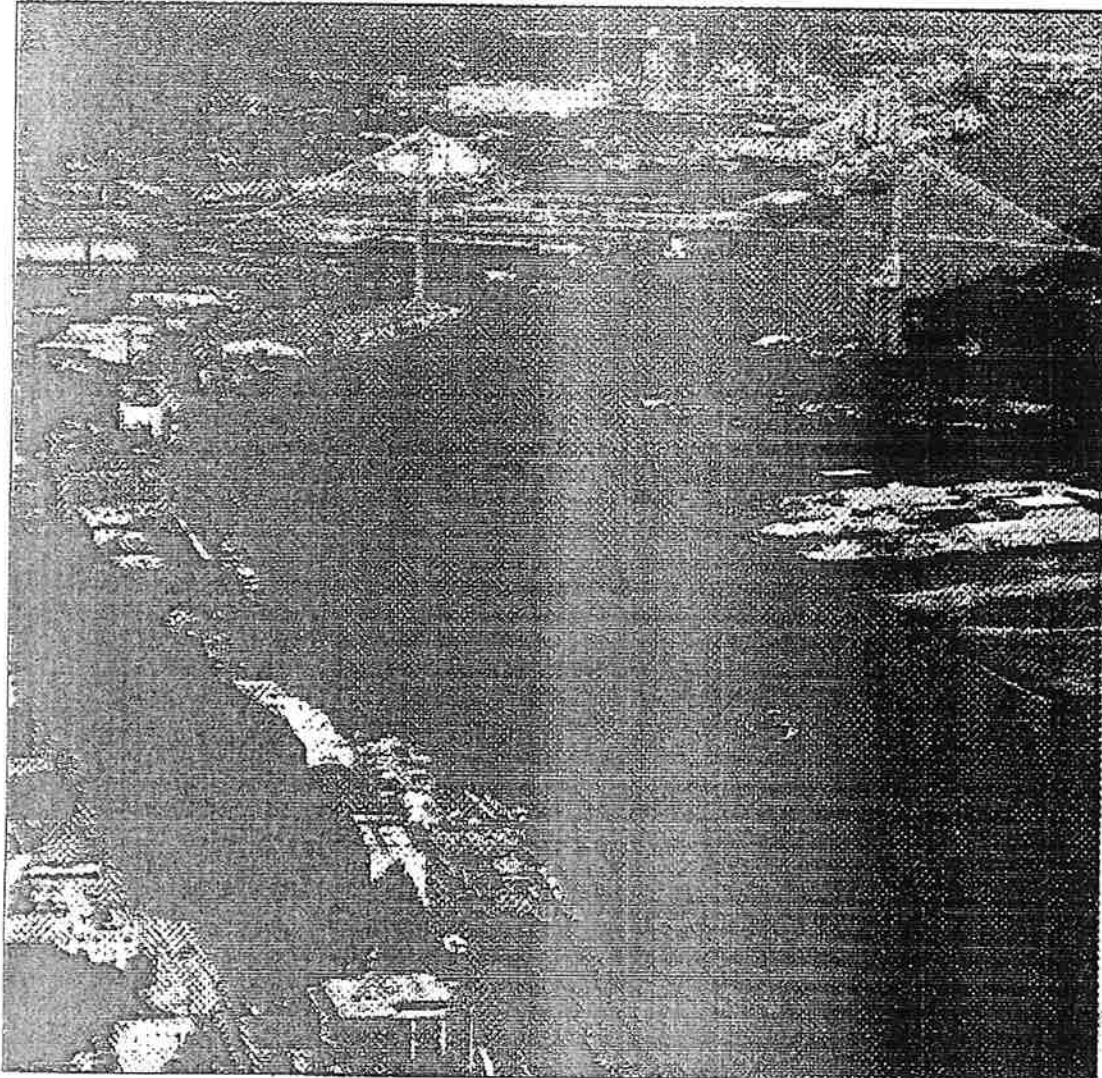
The Georgia Ports Authority operates modern and efficient deepwater port facilities in Savannah and Brunswick, Georgia and provides value added services to facilitate international trade. Inland barge terminals operated under the auspices of the Georgia Ports Authority are located in Bainbridge and Columbus, Georgia.

Visit the GPA website at <http://www.gaports.com>

For additional information, please contact James C. McCurry, Manager, Legislative Affairs at 912-964-3806 (800-342-8012) or via E-mail at jmccurry@gaports.com

Exhibit B

Approval for river deepening in peril



Savannah Morning News file photo

Deepening the harbor in Savannah will keep the city competitive with other Eastern Seaboard ports.

Savannah Morning News, Thursday, October 8, 1998

River

Continued from page 1A

one's going to be final minute if at all."

The Georgia Ports Authority has already spent \$6 million to study the feasibility of deepening the harbor. The project is estimated to cost \$200 million.

The Senate has approved a version of the bill, but the House must approve its version. Then a House/Senate conference committee must work out any differences.

The bill to fund the water act has the full support of the Senate, said Julie Robinson, spokeswoman for U.S. Sen Max Cleland, D-Ga.

But failure by Congress to act before it adjourns for the year could cost Savannah dearly in economic benefits from the ports, which provided 67,636 ports- and transportation-related jobs statewide in 1997.

Savannah ports officials previously have said that increased container cargo here could provide an additional 9,300 jobs (mostly in Georgia), \$1.7 million in Georgia wages, \$15 million in national sales and revenues, and \$34,000 in state and local taxes.

Ports officials are locked in a battle with Charleston, S.C., to be named the third of what's expected

to be only three megaport hubs on the Eastern Seaboard. Ports in New York and Virginia likely have a lock on the other two slots in the "hub-and-spoke" system — similar to how airlines operate — that is being devised for East Coast ports. The system, in which the hubs would funnel shipments to the smaller ports, is in reaction to a new breed of huge container ships plying international waters.

In Savannah, officials estimate port traffic could drop by nearly 50 percent long-term if the local port doesn't achieve "hub" status.

Charleston, S.C., already is lowering its harbor from 40 to 45 feet, with work to be completed in 2003.

"It is essential that we deepen the Savannah navigation channel in order that the port of Savannah remain competitive in the U.S. South Atlantic range," Swinson said. "And that Georgia's ports continue to act as a catalyst in helping to contribute to the economic growth and prosperity of the state."

Funding for the deepening project would take place over the next several years, Swinson said. But, he added, "everything is contingent on the results of the design phase."

Typically, the Water Resources Development Act is a biannual piece of legislation, Swinson said, meaning no action could push local plans back two years. However, Congress could come back and act on the bill in 1999.

A dispute over a California dam is the main reason the legislation has stalled, Kingston said. At issue is a disagreement between two California congressmen over how to control flooding in Sacramento from the American River.

"If they can get this done it will pass," Kingston said. "If they can't, the whole thing becomes a split."

Sam Drake, refuge manager for Savannah Coastal Refuges, said he's keeping a close watch on what Congress does.

Drake is concerned that deepening the channel would lead to salt-water intrusion into freshwater marshes.

Intrusion could threaten various plant species and wildlife, such as cypress trees, striped bass and short-nosed sturgeon, he said.

"I feel like it's a little premature to authorize the project," Drake said. "The best we can hope for is language in the bill that allows resource agencies to have input into the recommended depth to make it the least environmentally damaging."

But Kingston said if the act passes, people with concerns will still be able to give input to the dredging process.

"I'd hate to start all over again," he said. "It would be difficult to get back to where we are."

Legal issues reporter Ben Schmitt can be reached at 652-0366.

Exhibit C

7-6-98
SMN

Deepening harbor will keep ports competitive

By Doug J. Marchand

Georgia's ports have long played an important role as a catalyst in the economic growth and prosperity of our state.

Today, that role and the state's ability to aggressively attract cargo, create jobs and promote industrial development stand to be greatly diminished if plans to deepen the Savannah harbor fail.

As ocean carriers form new alliances, execute more efficient strategies for vessel deployment and invest in the construction of larger vessels capable of carrying 5,000-7,000 TEUs (TEU is a unit of measurement for determining the number of containers in 20-foot equivalent units. Example: One 40-foot-long container equals 2 TEUs), it is essential that Georgia's ports remain competitive and ready to meet the challenges of the international shipping community.

Over the past several years the size and capacity of container vessels, which at present account for more than 60 percent of the Port of Savannah's total tonnage, have far exceeded the levels previously predicted.

Specifically, container vessels currently calling the Port of Savannah, some measuring more than 900 feet in length and carrying more than 4,000 TEUs, were previously not projected to call Savannah, (America's 10th-largest container port) for another 20 years.

As a result of the accelerated growth in the size of today's container vessels, combined with the growing volume of cargo transiting the port's facilities, the Savannah River navigation channel is not capable of adequately accommodating many of the vessels now calling the port.

The inadequate channel depth has forced over 52 percent of container ships calling Savannah in 1996 to either load to less than capacity or to wait for high tides to safely transit the channel. Such operational constraints lead to dramatic increases in transportation costs, which are subsequently passed on to consumers.

Research indicates that for every two-foot deficiency in channel depth encountered by a vessel, ocean carriers experience additional operating costs exceeding \$13 million per year. Ultimately these operational constraints and higher operational costs force port users to seek more readily accessible port facilities.

From Fiscal Year 1989 through the end of Fiscal Year 1998 (a period of 10 years), the Georgia Ports Authority has moved more than 9 million tons of cargo. During that same period, cargo activity at the Port of Savannah has surpassed 72.6 million tons.



Marchand

represent the Georgia Ports Authority's 11th consecutive year of growth with FY98 totals surpassing 11.4 million tons, an increase of 6 percent over FY97 figures. At the Port of Savannah, FY98 tonnage will surpass 8.7 million tons, a 4-percent increase over the previous 12-month period and a 36-percent increase over FY89.

This 10-year period encompasses two significant events in Savannah: the opening of the new Talmadge Bridge and the deepening/widening of the navigation channel. Without benefit of those projects, we would not have enjoyed the increase in tonnage nor the corresponding increases in economic productivity measured in terms of jobs, personal incomes, sales revenue and state/local taxes.

A recent study of growth projections in the U.S. South Atlantic port range for container movement forecasts averages greater than 5.3 percent annually over the 2000 to 2050 study period, while imports of containerized goods are forecast to increase at an average annual rate of 3.9 percent during the same time.

The Port of Savannah's estimated growth in TEUs is projected to average 4.3 percent per year over the study period. This translates into an estimated growth in TEUs, beginning in 2000, of 52 percent every 10 years for 50 years.

The projected growth will be carried on larger and larger vessels, compelling the need to deepen the navigation channel. If a deepening project is not undertaken, projected growth and larger vessels cannot be accommodated.

In addition to accommodating the movement of commercial traffic, the Port of Savannah is renowned for its reputation and role in supporting the rapid deployment of U.S. military equipment and personnel. The U.S. Army conducts regular deployment readiness exercises via the Garden City Terminal.

Results of a 1997 economic impact study indicate that Georgia's public and private terminal operations directly or indirectly support 80,100 jobs, are responsible for \$1.8 billion in wages, generate \$23 billion in revenue and account for \$325 million in state and local taxes annually.

The impact of the port industry on not only the Savannah area, but to the more than 7.5 million Georgians statewide, is tremendous. As the world market continues to grow, so must the size of container vessels and the ability of the modern port to handle critical vessel requirements if it is to retain its customers.

It is imperative that Georgia continue to grow as a center of international commerce and that this and future generations of Georgians reap the rewards of a port prepared to accommodate the ongoing and diverse needs of the international shipping community.

Doug Marchand is executive director of the Georgia Ports Authority.

Exhibit D

Expert Report of Robert N. Stearns, Ph.D.

I. Experience and Qualifications

I have had a 40-year career as both teacher and practitioner in public policy and economics. The Corps of Engineers Civil Works program has been a major focus of my work, starting in 1976 when I served as an economist for the U.S. Coast Guard (Department of Transportation) and continuing today in my capacity as a consultant. For nearly ten years (1986-1995), I worked for the Department of the Army, first as a senior policy advisor for the Corps' Civil Works program and later as Deputy Assistant Secretary for Project Management. In these capacities, I had extensive experience in developing new policies and presenting ideas to Congress, the Office of Management and Budget (OMB) and other high ranking government officials. More recently, I served as a senior analyst for the National Academy of Public Administration for its 2007 study, "Prioritizing America's Water Resources Investments: Budget Reform for Civil Works Projects at the U.S. Army Corps of Engineers."

These experiences have given me an extensive knowledge of Corps water resources projects and a wide range of planning and budgetary issues. While my primary focus has been on the economics of transportation projects, my responsibilities have required me to be fully informed on virtually every aspect of the Civil Works program.

My career includes 15 years teaching economics, quantitative methods, and statistics at the college level, most recently as an adjunct professor at the University of Maryland's School of Public Policy. I received a Ph.D. in economics from Yale University and a B.A. in mathematics from Swarthmore College.

II. Materials Reviewed

In performing this work, I have reviewed all of the following:

- Draft General Re-Evaluation Report for Savannah Harbor Expansion Project Chatham County, Georgia and Jasper County, South Carolina, 15 November 2010 (GRR).
- Economics Appendix to above referenced GRR, November 2010.
- Multiport Analysis, Savannah Harbor Expansion Project (attachment to Economics Appendix), July 2006.
- Savannah Harbor Expansion Project Deep-Draft Channel Improvements Economic Analysis: Commodity Projections (attachment to Economics Appendix), August 2004.
- Savannah Harbor Expansion Project Regional Port Analysis (Attachment to Economics Appendix), July 2007.
- Engineering Investigations, Savannah Harbor Expansion Project, Chatham County, Georgia and Jasper County, South Carolina Draft, November 10, 2010.

- Draft Tier II Environmental Impact Statement for Savannah Harbor Expansion Project Chatham County, Georgia and Jasper County, South Carolina, 15 November 2010.
- U.S. Army Corps of Engineers, Savannah Harbor Expansion Project web site.
- Relevant newspaper articles available on the internet.

III. Summary

I have been retained by the Southern Environmental Law Center (SELC), which is preparing comments on the Savannah Harbor Expansion Project (SHEP). SELC has requested that I review and evaluate the economic analyses that the Army Corps of Engineers (Corps) has performed for SHEP. Specifically, I have been asked to provide my expert opinions on the following subjects:

- (i) whether the Corps performed an appropriate National Economic Development (NED) analysis on SHEP;
- (ii) whether the Corps performed the “multi-port analysis” correctly;
- (iii) whether the air draft issues involving the Talmadge Bridge were adequately considered in the economic analysis;
- (iv) whether the purported benefits of the project will accrue to the United States or will be spread around the international community; and
- (v) to what extent will this project help the United States meet other primary national economic goals.

Based on my background, education, training, experience, and the materials I have reviewed prior to formulating my opinion, I have concluded the following:

- (i) statements by the Georgia Ports Authority (GPA) and other business and community leaders indicate their belief that this project is needed for the port’s underlying business, thereby contradicting the Corps’ contention that the port’s growth rate will be the same with or without the project. The GRR and the DEIS fail to rectify these divergent views;
- (ii) the Corps’ so-called “multi-port analysis” and “regional port analysis” are based on inconsistent assumptions and fail to address the most important question of which port (or ports) in the southeast could be enlarged to accommodate the Post-Panamax ships with the least cost and fewest environment impacts;
- (iii) the Corps’ forecasts made in 2004 did not anticipate the 2008-09 international economic downturn and therefore are overly optimistic in predicting future

container traffic levels. Less container traffic reduces project benefits. The Corps' attempts to account for this downturn are inadequate;

- (iv) the trend in larger ships calling at Savannah, induced in part by the deeper channel, may create new incentives to raise the Talmadge Bridge to accommodate even larger ships, leading to significant additional costs that taxpayers will have to bear;
- (v) the Corps fails to acknowledge that many of the so-called "national" economic benefits from the cost savings associated with the proposed improvements to the port may actually accrue to foreign manufacturers and shipping lines rather than U.S. consumers and industries, and consequently the Corps fails to raise important national policy issues that should have been considered;
- (vi) the benefits of deepening U.S. ports such as Savannah to reduce the cost of imports must be seriously weighed against the impact this has on the competitive position of U.S. manufacturers in international commerce; and
- (vii) the Corps provides no evidence that any permanent jobs will result from the Port expansion, especially in light of the analytical assumption that the Port of Savannah's market share will not change because of the expansion.

IV. The Corps' Assumption that Deepening is Unrelated to Market Share is Contrary to Views Held by the GPA and Others in the Port Community.

The Corps' Planning Guidance Notebook states that in conducting a "National Economic Development" analysis, the Corps must base its analysis on the most likely with- and without-project scenarios.¹ In analyzing this project, the Corps assumed that the growth rate of the port as measured by tonnage received and shipped would be the same regardless of whether the port was deepened or not:

Under with-project conditions, the same volume of cargo is assumed to move through Savannah Harbor, however, a deepening project will allow shippers to load their vessels more efficiently or take advantage of larger vessels. This is the main driver of the NED benefits.²

This "assumption" is repeated in the Corps' Multiport Analysis:

[U]nder a 'least total cost analysis' with-project conditions [a deeper channel] should not be expected to shift any containerized cargo away from

¹ U.S. Army Corps of Engineers, Planning Guidance Notebook (Corps Planning Guidance Notebook), ER 1105-2-100, p. 2-6 (April 2000).

² U.S. Army Corps of Engineers Savannah Harbor Expansion Project, Draft Economics Appendix (Economics Appendix), p. 30 (November 5, 2010)(emphasis added).

competing ports for the major benefiting services and their current deployments.³

There is no doubt that the GPA believes that market share would be lost if the harbor is not deepened. GPA spokespersons have stated repeatedly that failure to deepen the harbor will put Savannah at a substantial competitive disadvantage and that without the harbor deepening, the container traffic through the port would remain at its current level or may even decrease as larger ships decide to call on other, deeper ports. Curtis Foltz, the new executive director of the GPA, recently stated in a speech to the House and Senate appropriations committees: “The ships and jobs will only come to Savannah if the harbor is deepened.”⁴ Mr. Foltz has also said that, “The Savannah harbor deepening project is critically important to continued economic growth in the southeastern United States.”⁵ Expanding still further, Mr. Foltz commented recently that, “expanding the Port of Savannah is a linchpin to the continued competitiveness of Georgia, the Southeast and indeed the United States in the global economy.”⁶

In fact, the GPA is so convinced that deepening the harbor is going to have a dramatic impact on container traffic that it is reported to be ready to spend \$20.4 million⁷ to have the Corps dredge an extra foot so the harbor will reach a depth of 48 feet instead of the 47 feet that the Corps selected as the plan with greatest net benefits. In addition, GPA “expects to spend another \$1.1 billion on cranes and rail yards to accommodate twice as many containers [by 2020].”⁸

The Corps acknowledged that shippers have similar views:

Each of the carriers interviewed were very supportive of channel modifications at Savannah Harbor and stated that without a deeper channel, shipping inefficiencies would worsen given the growth in cargo and the increased vessel sizes.... The carriers emphasized repeatedly that East Coast ports would need to be able to receive loaded Post-Panamax vessels upon Panama Canal expansion or risk losing services to ports which can accommodate this traffic.⁹

³ U.S. Army Corps of Engineers, *Multiport Analysis for the Savannah Harbor Expansion Project*, p. 103 (July 2006)(Multiport Analysis).

⁴ Walter C. Jones, *Georgia Ports' New Boss Makes Case for Harbor Deepening*, Savannah Morning News, January 20, 2010.

⁵ Mary Carr Mayle, *Kingston: Harbor Deepening Still Very Much Alive*, October 3, 2010, <http://savannahnow.com/news/2010-10-03/kingston-harbor-deepening-still-very-much-alive>.

⁶ Curtis J. Foltz and Mark Holifield, *Expanded Port Means More Jobs*, Atlanta Business Chronicle November 19, 2010, <http://bizjournals.com/atlanta/print-edition/2010/11/19/expanded-port-means-more-jobs.html>.

⁷ Mary Carr Mayle, *Harbor Deepening Gets Big Boost*, Savannah Morning News, July 17, 2010. The Corps has estimated the incremental construction costs from 47 to 48 feet to be 33.4 million. GRR at 180. All of these incremental costs must be picked up by the local sponsor.

⁸ Dan Chapman, *Atlanta Leaders Push for Deeper Savannah Port*, The Atlanta Journal-Constitution, December 1, 2010, <http://www.ajc.com/business/atlanta-leaders-push-for-762157.html>.

⁹ Economics Appendix at 29.

Retailers also agree. For example, Mark Holifield, the Home Depot executive in charge of logistics, has remarked that, “It is critical to maintain the competitive advantage that Savannah provides to Georgia and the region,” because “if trade advantages shift, we would have to re-evaluate our investments” by considering other ports.¹⁰

Politicians, too, have touted the expansion as a big boon to the economy. U.S. Representative Lynn Westmoreland recently said the following:

This expansion will increase the freight capacity of the port of Savannah by 20 percent, all the while creating 10,800 new jobs and \$242 million in additional income for employees. Some federal investment in this project would provide a significant return for the American taxpayer while bringing one of our country's top ports into the next generation of ocean commerce.¹¹

Likewise, Georgia’s new governor, Nathan Deal, just announced Georgia’s willingness to add another \$32 million dollars to the project.¹² This amount is on top of the \$150 million that the state has already guaranteed.¹³

Even the Corps itself has cast some doubt on its own assumption that serves as the foundation of its NED analysis, as the following statement shows:

Harbor development remains the most likely action to adversely affect the salt and brackish marshes remaining in the Savannah River estuary. *Harbor deepening would increase the amount of goods brought into the Savannah port.* This could trigger the need for additional distribution centers and other support facilities or the expansion of existing ones. These new or expanded support facilities could impact wetlands. In-kind mitigation would be required where wetland impacts are unavoidable.¹⁴

In light of the divergent views between the Corps’ economic models and the shipping community’s assessment of the effect the project would have on container traffic, the Corps has not adequately explained why its assumption is valid and the shipping community’s assessment is invalid. The answer to this question is paramount because:

¹⁰ Dan Chapman, *Atlanta Leaders Push for Deeper Savannah Port*, The Atlanta Journal-Constitution, December 1, 2010, <http://www.ajc.com/business/atlanta-leaders-push-for-762157.html>.

¹¹ Lynn Westmoreland, *Westmoreland: Obama—Support Harbor Deepening*, Savannah Morning News, October 30, 2010, <http://savannahnow.com/column/2010-10-30/westmoreland-obama-support-harbor-deepening>.

¹² Aaron G. Sheinin and James Salzer, *Deal Warns of Cuts, Promises Progress in First State of the State*, The Atlanta Journal-Constitution, Jan. 12, 2011.

¹³ Mary Carr Mayle, *Kingston: Harbor Deepening 'Still Very Much Alive,'* Savannah Morning News, Oct. 2, 2010.

¹⁴ Draft Tier II Environmental Impact Statement for Savannah Harbor Expansion Project Chatham County, Georgia and Jasper County, South Carolina, p. 33, November 15, 2010 (emphasis added).

- if the Corps is correct, then there is no need to deepen the channel to keep Savannah Harbor functional and competitive; or
- if the shipping community is correct, then the Corps' economics analysis is fundamentally flawed because the Corps' NED analysis rests on its assumption that the with and without project scenarios would produce the same amount of container traffic.

The following example is not taken from any Corps document, but it will help to illustrate that if traffic levels are not the same for the with- and without-project conditions, then some of the Corps' assumptions and conclusions are flawed. In this hypothetical example, a year after the deeper Panama Canal is opened, a shipper has decided to import 1,000 twenty-foot containers from the Far East into the United States through Savannah. If the Channel depth at Savannah is 42 feet, he will hire a Generation One Post Panamax ship to carry this cargo.¹⁵ If the Channel depth is 48 feet, he will hire a Generation Two Post Panamax ship,¹⁶ which will allow the shipper to save \$20 per container.¹⁷ As a result, use of the bigger ship and deeper channel will result in a total cost savings of \$20,000 for the shipper. In the Corps' economic analysis, this savings could be added to other similar savings to obtain the major component of the anticipated project benefits.

If GPA and other members of the shipping community are correct, the failure to deepen the harbor may lead the shipper to look for a deeper port that can accept the bigger ship. This will most likely be a cost-based decision. It may mean, for example, that instead of using Savannah at 42 feet, the shipper might choose Norfolk as the port of entry. The savings associated with switching ports could be as much as \$19,999.¹⁸ But for purposes of this example, if the savings associated with switching to Norfolk are only \$9,000, then the benefits attributable to a deeper Savannah Harbor would only be \$11,000 instead of the full \$20,000 that results from the Corps' assumption of no-diversion. This hypothetical shows that project benefits could be smaller if the shipping community is right about Savannah Harbor losing traffic if the channel is not deepened. And, if the project benefits are smaller than calculated by the Corps, then net benefits (benefits minus costs), which drive the decision for a deeper channel, will also be less than reported in the NED analysis.

¹⁵ Assumption Two listed in the "Summary of Assumptions" is that "[Post Panamax] ships will call on the Savannah Harbor in both the without and with-project conditions on the larger trade routes which are currently constrained by the Canal." Economic Appendix at 74. In the without project case, this can be accomplished by such actions as "riding the tide" (Economics Appendix at 23-24), or not using Savannah as the first port of call into the South Atlantic Coast (Economic Appendix at 12).

¹⁶ See Assumption Three in the Economics Appendix at 74.

¹⁷ According to the Corps' Multiport Analysis, the cost savings per twenty foot container (TEU) for vessels moving from the Far East (FE) to the East Coast of the United States (ECUS) and thence to Europe (EU) will be \$18.74. Multiport Analysis, Table 39 at 100.

¹⁸ The savings associated with switching to Norfolk could not be more than \$20,000 because if this were true, the shipper would be using Norfolk, *with or without* the deeper harbor at Savannah. Of course, land shipment costs to the final destination must also be factored into the analysis.

V. The “Multi-Port” Analysis Omits Material Factors and is based on Inconsistent Assumptions.

For purposes of the multiport analysis, the Corps has failed to adequately consider the interplay between different ports and competing port expansions. Economic principles dictate that to be complete, a comprehensive multiport analysis for SHEP should include each of the following study elements:

- (i) the extent to which the port of Savannah would lose or gain container traffic depending on whether deepening occurs and to what depth;
- (ii) the effect deepening of Savannah Harbor would have on container traffic at other neighboring ports;
- (iii) whether instead of deepening multiple ports on the eastern seaboard, a single “super port” should be created with the other ports functioning as “feeder” ports; and
- (iv) whether, in light of the limited availability of federal funds, the Federal government could deepen a different port in the southeast more cost effectively and with fewer impacts on the environment.

The Corps’ NED approach to study elements (i) and (ii) is to assume that there would be no traffic gains or losses (see Section IV above). These questions are then revisited extensively in the Corps’ Multiport Analysis that was completed in July 2006. The conclusion of this study, based on “least cost routing” models, is that deepening Savannah Harbor would not divert traffic from other ports. This finding is consistent with the Corps’ NED assumption that market share is independent of channel depth, yet (as described above), conflicts with the position of the port community.

Study element (iii) is covered in the Corps’ Regional Port Analysis that was completed in July 2006. This study element was motivated by stakeholder concerns:

[S]ome project stakeholders expressed that there should be a study of allocating Federal improvement funds at one regional port in the South Atlantic range, rather than deepening several ports. They seemed to believe that this would make sense economically (since fewer funds would be expended) and environmentally (since the impact of dredging would only occur at one port rather than at several).¹⁹

The Corps methodology was (1) to assume that all growth traffic in the South Atlantic port area would flow through the designated “super port;” and (2) to evaluate whether or not any of the existing ports had the existing or planned terminal capacity to accommodate the traffic:

¹⁹ U.S. Army Corps of Engineers, Savannah Harbor Expansion Project Regional Port Analysis (Regional Port Analysis, p. 1 (July 2007).

A regional port concept that concentrates existing capacity and/or future growth in demand at a particular “port” in the region was examined by *shifts in port throughput* (Table 6) and *shifts in growth of container volumes among adjacent ports* (Table 7).²⁰

The Corps’ conclusion is that a “super port” concept would not work because no port has the (current and planned) land side capacity to handle the entire growth potential for the southeast Atlantic Coast.

As an initial matter, it is interesting to note that for purposes of this report, the Corps has concluded that deepening *can* affect market shares, an assumption clearly at odds with the NED analysis. In addition to this inconsistency, the Regional Port Analysis is flawed because the authors failed to at least consider the possibility that ports would still be able to compete successfully for at least some of the projected growth traffic even if they were in competition with a single “super port.” If the authors had considered this possibility, they might have come to a significantly different conclusion. For example, with the construction of a so-called “super port,” it is possible (consistent with the assumption of the Corps Regional Port Study) that as the overall level of traffic grows, most of the incremental containers shipped to the East Coast would arrive on Post Panamax ships and that those ships would almost always call on the super port.

It would seem more likely that even with a super port, smaller ships would still make direct calls on smaller ports and light-loaded larger ships would as well. Unless the Corps cannot rule out this more likely scenario, then it cannot assume that all incremental cargo shipped to the East Coast would head directly to the super port. The conclusions of the Regional Port Analysis, however, conveniently support the scenario of deepening multiple ports. By failing to consider the possibility that smaller ships would still make direct calls on smaller ports and larger ships would continue to light load, the stakeholders concerns have not been adequately addressed. At the same time, the inconsistency in the assumptions of the Regional Port Analysis that deepening *can* affect market shares are in stark contrast to the Corps’ other study elements and are a major weakness in the Corps’ overall analysis.

By focusing on terminal capacity constraints, the Corps’ Regional Port Study missed a major opportunity to develop a strategic plan for federal spending on port improvements throughout the Southeast Atlantic Coast region. This question, clearly one of the stakeholder concerns as acknowledged by the Corps (see above) is equivalent to my Study Element (iv). It was apparently not considered even though it is a critical issue of national importance. With limited federal resources available for port development projects, it is essential to determine where incremental port development funding can be most efficiently spent.

By failing to determine where incremental port development funding can be most efficiently spent, the Corps has not completed a rational and complete assessment of the

²⁰ Id. at 7 (emphasis added).

benefits and costs of this project. If, for example, there is only sufficient funding to deepen one harbor in the southeast at this time and another already-existing port in the region could be deepened to 48 feet for \$200 million and cause limited environmental impacts, whereas the Savannah Harbor project will cost over \$500 million dollars and will cause greater environmental impacts, it would make little sense to move forward with SHEP. Without this type of comparison, the NED analysis is flawed.

VI. The Traffic and Fleet Forecasts Used by the Corps Likely Overstate Project Benefits in a Significant Way.

The projected benefits for this project depend crucially on two forecasts. The first is the baseline commerce measured in either tons or in the number of containers²¹ that Savannah is predicted to import or export. The second is the world fleet of container ships available to use in the delivery of these products to or from Savannah. The trade forecasts are a statistical projection of past trends and are “optimistic” in the sense that future levels far exceed current levels.²²

Historically, economies and trade between nations has grown in correlation. The recent downturn in world economies is a significant departure from the long-term trends and may be a more important indicator of possible changes in this trend. The trade data (from U.S. Census) shows that imports fell 21 percent between 2008 and 2009, while exports fell by 13 percent.²³ These same statistics (available through November 2010) show that while there has been a rebound in 2010, this rebound is not likely to bring trade back to the 2008 level.

By using baseline commodity forecasts completed in 2004, the Corps could not have anticipated these recent events. Since lower traffic levels mean fewer project benefits, changes in the world economy could seriously alter the basic benefit/cost equation. The Corps “considered” the dip in trade in one of its sensitivity scenarios and concluded that it would reduce project benefits by only one percent.²⁴ The recent economic downturn appears to have affected the Corps’ forecasts, but only slightly.

This conclusion raises two important questions. First and most obviously: is it based on sound economic analysis? While the Corps “used” 2009 data in its sensitivity scenario, it did not simply use 2009 traffic as its new forecasting baseline. Instead, it calculated a baseline by taking the average for trade-route specific data from 2005 through 2009.²⁵ Thus, the downturn was given only a 20 percent weight in a revised baseline. This procedure is arbitrary and raises serious questions about the projected

²¹ While there is some non-container port traffic, the argument for deepening Savannah Harbor is based primarily on the effect it would have on container ship traffic.

²² For example, the expected level of imports in 2020 is predicted to be almost twice the level in 2008.

²³ U.S. Census Trade Data is available at <http://data.usatradeonline.gov/View/dispview.aspx> . Percentage drops are based on containerized vessel tonnage only. 2010 data is available only through November. While year to date exports through November are almost at 2008 levels, imports remain well below 2008.

²⁴ GRR at 232.

²⁵ A fuller (although not complete) explanation of the methodology of this sensitivity analysis is given in the Economics Appendix at 119-120.

totals for future years, especially in the next decade. As a consequence of the procedure chosen, the Corps' forecast for 2010 is significantly higher than actual tonnage. The forecasts predicted that container traffic (combined exports and imports) would be 10.1 percent higher in 2010 in comparison to 2008.²⁶ Using Census data that is now available through November 2010, the actual tonnage (while rebounding from the extraordinary losses in 2009), is only 0.1 percent above the 2008 levels.²⁷

The second question is: if commodity forecasts should be lowered, what difference would it make? If traffic is growing at a slower rate, the benefits may not even exceed project costs, a possibility that the Corps acknowledges:

This is not to say that there are no future circumstances in which there is not a plan with benefits exceeding costs, but rather such circumstances are not likely. For example, a no-growth or very low-growth scenario with substantially less PPX vessels, such as Sensitivity 9, could result in plans wherein benefits do not exceed costs.²⁸

Even if the Corps' conclusion that such scenarios are not likely, with actual traffic failing to meet the Corps' short term forecasts, consideration should be given to delaying the start of the project. Because net benefits are calculated by discounting future years, the project's net benefits and benefit-to-cost ratio may actually be higher with a later startup date. Postponing construction may not only be better from a benefit/cost (NED) perspective, but it would also support the broader federal objective of deficit reduction that has become a critical national priority. In light of these concerns, the Corps should include a sensitivity scenario that gives greater weight to recent trade data and show what happens to project economics if the trade developments are significantly below the baseline forecasts. A full evaluation of this scenario would include consideration of timing alternatives for the project and disclose the comparative benefits and costs of differing construction schedules. Failure to conduct this analysis would be unreasonable.

VII. The Corps Dismisses the Possibility that a Deeper Channel May Induce Even Larger Ships and thereby Ignores the Cost of Raising the Talmadge Bridge.

As larger and larger ships enter Savannah Harbor, new issues arise concerning the safety of the trip. One particular concern is the Talmadge Bridge that allows vehicular traffic to cross over the Savannah River between the harbor facilities and the open ocean. This issue was considered, and the Corps reached a conclusion that it would not be an issue for the ships expected to be used in Savannah. The problem was described as follows:

²⁶ See Economics Appendix at 40-41.

²⁷ Census data is available at <http://data.usatradeonline.gov/View/dispview.aspx>. To estimate full 2010 figures (December amounts are not yet available), the 2009 share of traffic in December was assumed to be the same as the 2010 share of traffic in December.

²⁸ Economics Appendix at 129.

The Talmadge (Savannah River) bridge has an air draft height of 185 ft. above MHHW, as per design drawings provided by Georgia DOT. See Figure 6.2.4.3-1. This height is based on the lower edges of the span above the navigation channel. Height above MHHW actually ranges from 192 ft. to 200 ft. in the middle of the span. The 185 ft. distance is used by the Savannah Harbor pilots as the official (conservative) air draft of the bridge.

* * *

The Savannah office for the USCG deferred to the Savannah River Harbor Pilots Association for restrictions on air draft. The Savannah River Harbor Pilots Association stated that there was no official policy regarding the air draft of vessels coming into the harbor. From information gained, a vessel's air draft is provided to the pilot and the Coast Guard before the vessel enters the channel. One carrier interviewed stated they use 3 ft as minimum allowance.²⁹

The Corps concludes that the Talmadge Bridge presents no air draft problems for Generation Two Post-Panamax ships, the so-called "design vessels" that are expected to call at Savannah if the Harbor is deepened to 48 feet:

USACE was provided with proprietary information listing vessels that were considered to make up the design fleet. The "workhorse" for the projected fleet is expected to be an 8200 (+/- 400) TEU [Generation Two] vessel. The upper height limit for these vessels was listed at 62 m (meters) or 157 ft for the design draft of 47.6 ft. Even if the superstructure was raised 10 ft to accommodate another tier of containers and the vessel was light loaded by an additional 10 ft (any more would not be economically considered according to IWR), the air draft would only increase to 177 ft which is still within an acceptable tolerance considered by the Savannah River Harbor pilots.³⁰

So, the Corps' "worst case" scenario would involve the ship missing the bridge by 8 feet. Since the minimum "safe" distance appears to be 3 feet, the Talmadge Bridge does not present a height restriction problem for the ships the Corps expects to see entering the harbor. Simply stated: "Neither the design vessel nor the design fleet mix will violate the air draft restriction presented by the Talmadge (Savannah River) Bridge."³¹ The key to this conclusion is the word "design." It is inevitable that larger ships will be built (Generation Three Post-Panamax ships). In fact, the Corps baseline forecast of Post-Panamax fleet composition shows Generation Three ships becoming 18 percent of the total fleet by 2015, up from the current share of two percent.³² Not surprisingly, given the information provided above, the Corps expects that such ships would encounter problems going under the Talmadge Bridge:

²⁹ Engineering Investigations, Savannah Harbor Expansion Project, Chatham County, Georgia, and Jasper County, South Carolina, Draft, November 10, 2010, pp. 65-67. MHHW stands for "Mean Higher High Water."

³⁰ *Id.* at 68-69. "IWR" refers to the Corps' Institute for Water Resources.

³¹ *Id.* at 69 (November 10, 2010).

³² Economics Appendix at 52 (see Table 28).

Another major constraint at Savannah is the Talmadge Memorial Bridge, a 20-year old, cable-stayed bridge, which provides a vertical clearance of 185 feet. The keel-to-mast height of the Emma Maersk is reported to be 251 feet, so even after adjusting for tide and retractable masts, its air draft exceeds the allowable clearance of the bridge. If such vessels do indeed call at Savannah, they would need to be light loaded considerably.³³

The Corps contends that the larger Generation Three ships will not call on Savannah Harbor, but will instead be used elsewhere in the world, where ports are bigger and deeper. Therefore, a Generation Three ship was not used as the “design” vessel for this project.

If a major bridge alteration were part of SHEP, there is a real possibility that the high cost of this related work would mean that SHEP would not generate any net economic benefits as traditionally defined by the Corps. The analytical assumption that Generation Three ships will not call at Savannah Harbor is a convenient way to dismiss this potential problem. If the Corps’ baseline vessel forecast is right,³⁴ there is a strong probability that the largest ships would be calling at some ports on the Southeast Atlantic Coast. Given the shipping lines’ business practice of multiple ports of call, GPA may soon want to accommodate these larger ships at Savannah Harbor. The height of the Talmadge Bridge will become an increasingly contentious issue.

There is a fundamental two-way relationship between channel depths and vessel sizes. Deeper channels induce larger ships and larger ships induce deeper channels. Recent comments by Curtis Foltz, the new executive director of the GPA illustrate this point: “Anything short of 48 feet is something that we would be disappointed with. Ships aren’t getting any smaller. They’re only getting bigger.”³⁵ The Talmadge Bridge’s height restriction may not actually be a long-term constraint on ship size despite the Corps NED assumptions for SHEP. A deeper channel for Savannah Harbor significantly increases the likelihood that raising the bridge will soon be requested.

³³ Economics Appendix at 51.

³⁴ In this case the Corps says that the economic recession may have significantly altered the possibility of Generation Three Ships being built: “Despite a flurry of ship building following the introduction of the Emma Maersk and MSC Daniela to the world fleet, many ship builders have cancelled orders or scaled back the dimensions of their requested vessels in the orderbook. Part of this was due to the contraction in the global economy.” Economics Appendix at 51. This is a fundamentally different view of the effect of the recession on commodity forecasts, where the Corps’ sensitivity analysis is that the downturn would effect transportation cost savings (and therefore benefits) by only one percent. Economics Appendix at 120.

³⁵ Dan Chapman, *Atlanta Leaders Push for Deeper Savannah Port*, The Atlanta Journal-Constitution, December 1, 2010, <http://www.ajc.com/business/atlanta-leaders-push-for-762157.html>.

VIII. The Corps Does not Establish that the Benefits of the Harbor Deepening Would Benefit the United States' Economy.

As with all other navigation projects, the Corps bases its economic analysis on 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*.³⁶

The Corps implementing guidelines for applying these Principles and Guidelines are contained in the Corps' Planning Guidance Notebook (ER 1105-2-100). For Savannah Harbor, the relevant portion of this document states:

National Economic Development Benefits. The base economic benefit of a navigation project is the reduction in the value of resources required to transport commodities. Navigation benefits can be categorized as follows:

- (a) Cost reduction benefits for commodities for the same origin and destination and the same mode of transit thus increasing the efficiency of current users. This reduction represents a NED gain because resources will be released for productive use elsewhere in the economy...

Examples for deep draft navigation are reductions in costs associated with the use of larger vessels, with more efficient use of existing vessels, with more efficient use of larger vessels, with reductions in transit time, with lower cargo handling and tug assistance costs, and with reduced interest and storage costs.³⁷

Under the guidance of the Planning Guidance Notebook, it is permissible to include in NED benefits the transportation cost savings for any commodity movement regardless of origin or destination. This would include imports from other countries or exports to other countries. To the contrary, the underlying Principles and Guidelines require a measurement of benefits accruing in the planning area and to the rest of the nation and should therefore exclude benefits accruing to foreign entities. There are clearly important differences between these two documents.

³⁶ United States Water Resources Council, "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies," p. iv (March 10, 1983)(emphasis added).

³⁷ Corps Planning Guidance Notebook at 3-5.

A primary source of benefits attributed to this project by the Corps is derived from the fact that a deeper harbor leads to lower transportation costs of goods imported into this country, mostly from the Far East. Such savings, assuming that they occur, will be distributed among various entities. The savings may be absorbed by the exporting company or by shipping companies (thereby generating what economists define as “producer surplus”), or passed on to the consumer (“consumer surplus”). Determining how the savings would be distributed would depend on a number of factors, including the elasticities of supply and demand. The Principles and Guidelines clearly state that the Corps’ analysis should be focusing on benefits to the planning area and the rest of the nation. The analysis for Savannah Harbor Expansion is therefore incomplete unless the Corps attempts to determine where SHEP benefits are likely to accrue.

From a U.S. policy perspective, in the “worst case” scenario, there would be virtually no injection of any money into the U.S. economy as a result of project deepening. Foreign manufacturers and shipping lines may keep the savings of shipping through Savannah for themselves and pass none of these savings to U.S. consumers.³⁸ Under such circumstances, the U.S. taxpayer would be asked to foot the bill to pay for a project that generates greater profits or lower prices for producers and consumers in other countries. In an era of huge federal deficits, the project might actually be financed by the very countries who obtain the greatest benefits from the project.

What might a “best case” scenario look like? In this section, I have focused on U.S. imports, because that is where most of the benefits appear to have been generated. Although the Corps does not provide the precise breakdown of benefits to exports and imports, it is possible to infer the relative shares, at least by order of magnitude. I begin by presenting the relevant data on the distribution of project benefits by benefit category, reproduced from the Economics Appendix.³⁹

Benefit Category	Average Annual Benefits for 48’ Project Depth (Thousands of dollars)	% Share of Total Benefits
Transportation Cost Saving	\$139,151	92.54
Tide Delay Reduction	\$10,400	6.92
Meeting Area (Long Island Oglethorpe)	\$810	0.54
Total Average Annual Economic Benefits	\$150.361	100.00

³⁸ Also in the worst case scenario, different supply and demand elasticities in the export market may cause the savings from exports to be passed on to foreign consumers.

³⁹ Economics Appendix, Table 165 at 185.

The Corps' Multiport Analysis shows how much could be saved per 20 foot equivalent container (TEU) at various channel depths over various trade routes.⁴⁰ This information is summarized here:

Vessel Cost Savings by Project Depth for Benefiting Services (\$/TEU)

Depth and Direction of Traffic	FE ECUS MED	FE ECUS EU	FE SUEZ ECUS
48 in (imports)	\$13.27	\$18.74	\$3.34
48 out (exports)	\$5.92	\$3.94	\$4.32
48 out as % of 48 in	45%	22%	124%

FE ECUS MED- Far East to East Coast U.S. to Mediterranean via Panama Canal

FE ECUS EU- Far East to East Coast U.S. to Europe via Panama Canal

FE SUEZ ECUS- Far East to East Coast U.S. via Suez Canal⁴¹

Finally, U.S. Census data shows the breakdown between imports and exports. For 2009, imports, metric tons of containerized cargo = 6.0 million; export, metric tons of containerized cargo = 9.7 million. The import share of total trade = 38 percent.⁴²

All of the data presented in this section show first that transportation costs saving is *the* major benefit category and while exports through Savannah outnumber imports, the project will have a much greater impact on imports for shipments coming through the Panama Canal. According to the Corps, in 2007, 69 percent of total calls were by services that transit the Panama Canal.⁴³ If, for purposes of illustration, two-thirds of the transportation cost-savings benefits are for imports and, in the best case scenario, all of the savings are passed on to the consumer, the citizens of Georgia (pop. = 9.8 million) and South Carolina (pop. = 4.6 million) may, in a best case scenario, enjoy a per capita reduction in their purchases of imported goods of roughly \$6.50 per year.⁴⁴

The Corps may argue that once NED benefits are calculated, any subsequent breakdowns of the data, such as those presented here, are “out of scope.” But there is a critical difference between measuring “benefits to the nation” (as described in the Principles and Guidelines), and “measuring NED benefits” (as described in the Corps’ own Planning Guidance Notebook). Projects of the SHEP’s magnitude must be analyzed using both perspectives, something the Corps has not done.

⁴⁰ Multiport Analysis, Table 39, at 100.

⁴¹ See Multiport Analysis at 7 for a description of trade routes.

⁴² U.S. Census Foreign Trade Data is available at <http://data.usatradeonline.gov/View/dispsview.aspx>

⁴³ Economics Appendix at 25.

⁴⁴ Population estimates are from U.S. Census Bureau (estimates are for 2009), 2/3 of transportation cost savings = \$92.7 million per year. If instead of 2/3, total benefits were distributed to U.S. consumers of imports, the per capita figure would be \$6.96. For the estimated savings given in my example, assume that the final destinations of imports through Savannah Harbor are either in Georgia or South Carolina.

IX. A Deeper Channel Would not Make the U.S. More Competitive in International Markets.

Should the United States government help U.S. manufacturers improve their competitive position in international markets? While policy makers' answers might range from a resounding yes to one that is scrupulously neutral (i.e., "let the markets decide"), it is doubtful that few if any would support policies or actions that would actually hurt the U.S. manufacturing base. How does the Savannah Harbor Expansion Project fare in an analysis of this important question?

Tables 15 and 18 in the Corps' Economics Analysis Appendix⁴⁵ give a descriptive picture of which containerized goods are being exported and imported through Savannah, where they are going to and coming from. Since the data in these tables mirrors the aggregate U.S. Census data, I will use the information provided by the Corps.

Table 15 lists the top five import commodity groups coming from each of the top five sending countries. Table 18 does the same thing for exports. One useful way of arraying this data is to rank, in order, the amounts from Tables 15 and 18 (separately). In each of my tables presented below, I present the top 15 commodity type/country combinations.⁴⁶

Top 15 Commodity/Type Country Combinations for Containerized Imports through Savannah 2007

Rank	Commodity Description	Country	Tons
1	Furniture and Fixtures	China	541,146
2	Other Manufacturing nec	China	393,846
3	Metal Products	China	315,461
4	Non-Metallic Products nec	China	186,399
5	Plastic Products nec	China	184,569
6	Non-Metallic Products nec	Brazil	179,507
7	Synthetic Resins	South Korea	107,348
8	Iron & Steel	Japan	72,887
9	Natural Rubber	Thailand	63,111
10	Textiles	Brazil	56,575
11	Natural Rubber	Indonesia	49,570
12	Iron & Steel	Brazil	46,702
13	Metal Products	Taiwan	41,703
14	Textiles	India	39,023
15	Machinery & Equipment nec	Japan	38,689

⁴⁵ Economics Appendix at 35 & 37.

⁴⁶ The listings include containerized traffic only.

Top 15 Commodity/Type Country Combinations for Containerized Exports through Savannah 2007

Rank	Commodity Description	Country	Tons
1	Stone, Clay and Other Crude Materials	Japan	1,164,794
2	Meat/Dairy/Fish requiring Refrigeration	China	387,524
3	Stone, Clay and Other Crude Materials	China	316,983
4	Pulp	China	283,064
5	Stone, Clay and Other Crude Materials	Taiwan	249,205
6	Scrap	China	239,761
7	Cotton	Turkey	233,642
8	Synthetic Resins	China	207,418
9	Paper & Paperboard & Products	Turkey	176,460
10	Pulp	Japan	171,522
11	Stone, Clay and Other Crude Materials	South Korea	146,084
12	Pulp	Italy	114,276
13	Pulp	Turkey	102,753
14	Pulp	Brazil	86,740
15	Machinery & Equipment nec	South Korea	78,820

These tables tell many stories (such as the degree to which U.S. imports come from China). My purpose here is to point out perhaps the most important difference between the tables. The imports through Savannah are generally manufactured products and not “raw materials,” while the exports are generally the opposite. So while deepening the harbor may make it less expensive to export stone, clay, and glass to Japan, it also makes it less expensive to import furniture and fixtures from China. From the perspective of the U.S. manufacturing base, this seems like a poor trade-off.

X. Under the Corps’ Economic Assumptions, this Project would not Create a Significant Number of Sustainable New Jobs.

As I stated earlier in Section IV, the Corps assumes the Savannah Harbor Expansion Project will not induce any additional port traffic. This assumption severely limits the project’s ability to create new jobs for Georgia and South Carolina beyond the work associated with the actual deepening itself. Clearly, there will be no induced jobs created by changing market share if the Corps is correct that this project is unrelated to increasing the port’s business. Increased business (i.e., more imports and exports using the port) is no doubt the main source of job creation that might be anticipated by the local sponsor.

Possibly, by reducing the prices of imported goods, U.S. consumers will have more disposable income to spend on other goods and services which has the potential to create some new jobs. But as I have already shown (Section VIII), the disposable income effect under the best case scenario is likely to be miniscule and even this will not create U.S. jobs if consumers use their extra disposable income, whatever the amount, to buy additional foreign manufactured goods.

Despite its own analytical assumptions, in its General Reevaluation Report, the Corps claims that the job impact of deepening the channel will be 5,671 new jobs.⁴⁷ However, I am unable to connect this estimate to any other part of the analysis.

United States' ports often cite economic studies that measure the number of jobs that are either created by the port or sustained because of port activities. One such example is "The Economic Impact of Georgia's Deepwater Ports on South Carolina's Economy in FY 2009," April 2010, authored by Jeffrey M. Humphreys.⁴⁸ While it is true that ports are important economic engines for their communities and states, the "jobs issue" here is not how many jobs are supported by the port, but the extent to which the number of jobs may change if the harbor is deepened. Given the assumption that underlies the Corps' NED analysis, the answer is that this proposed deepening will not result in additional jobs since the port's underlying business will remain unchanged. In fact, as Table 42 shows in the Corps Economics Appendix,⁴⁹ if the channel is deepened there will be fewer, albeit larger, ships calling at Savannah. If jobs at the port are linked more closely to the number of ships calling than to the number of containers handled, a deeper channel might actually mean fewer jobs in the local economy.

XI. Conclusions

According to the Corps' recently released draft General Reevaluation Report,⁵⁰ the Corps is asking the American tax payer and the project's local sponsor to pay over \$600 million to deepen the Savannah Harbor to 48 feet. If the Corps is correct that the project is unrelated to the port's underlying business, then there is no need to deepen the channel to keep Savannah Harbor functional and competitive. Even if the deepening would produce efficiencies that would in turn reduce shipping costs, the Corps has failed to determine that these efficiency savings will accrue to U.S. citizens. On the other hand, if the Georgia Port Authority is correct that the deepening is needed to maintain or increase its business, then the Corps' economics analysis is fundamentally flawed. Moreover, the Corps has failed to perform a true multiport analysis to determine, in light of the limited availability of federal funds, if the federal government could deepen a different port in the southeast more cost effectively and with fewer impacts on the environment. In evaluating port expansion projects, it is especially important that the Corps' analytical basis for its recommendation to proceed be objective, rigorous and comprehensive. For the Savannah Harbor Expansion Project, the Corps has not met these standards.

⁴⁷ GRR at 195.

⁴⁸ Mr. Humphreys acknowledges that the study was supported by a grant from the Georgia Port Authority.

⁴⁹ Economics Appendix at 73.

⁵⁰ GRR at 180.

Dated: January 25, 2011

Respectfully submitted,



Robert N. Stearns, Ph. D.

Exhibit E

EXPERT REPORT OF SHAWN P. YOUNG, PH.D.

I, Shawn Paul Young, Ph.D., provide this expert report on behalf of the Southern Environmental Law Center (SELC) in the matter of the Savannah Harbor Expansion Project (SHEP). I submit this report as a private consultant in this matter. The opinions and conclusions that I express in this expert report are my own.

My current business address is Shawn Paul Young, LLC, P.O. Box 507, Bonners Ferry, Idaho, 83805. My professional and educational experience is summarized in the updated curriculum vitae attached to this report. I received a B.S. in Environmental Studies from Northland College; a M.S. in Aquaculture, Fisheries, and Wildlife Biology from Clemson University; and a Ph.D. in Fisheries and Wildlife Sciences from Clemson University. I have 13 years of experience researching the effects of human activities on fisheries and aquatic ecosystems. This includes 11 years of experience performing field research and environmental consultation on aquatic resources of southeastern rivers, including the Savannah River. I have previously held visiting faculty and/or research appointments in fisheries sciences and aquatic ecology at the University of Idaho, Purdue University, and Clemson University. In addition to my professional qualifications, I am an avid outdoorsman – fishing, hunting, and enjoying nature in every manner since my early childhood.

My main research interests focus on fisheries ecology and management in altered ecosystems. I have been consulted by public, state, federal, and academic sectors in the subject areas of fish and aquatic ecology. I have in publication, in press, and in review twenty-seven peer-reviewed articles relevant to fisheries and aquatic ecology. I have presented scientific

presentations at numerous professional meetings, academic seminars, and citizen fishing association functions.

In addition to my professional education, training, research, and publications, I have considered the findings of other scientists as listed in the Literature Cited section found at the end of this document, and the following information about the Savannah Harbor Expansion Project in forming my opinions. The information I considered has included facts that I would ordinarily consider and rely on in reaching opinions about the health, function, and viability of fisheries resources.

- a. General Re-evaluation Report (GRR)
- b. GRR Appendix C Attachment 3: Supplemental Studies
- c. Draft Tier II Environmental Impact Statement (DEIS)
- d. DEIS Appendices

My opinions and the rationale for these opinions regarding the impacts from the proposed dredging to deepen Savannah Harbor follow.

GENERAL EXPERT OPINION – SHEP IMPACTS TO FISH POPULATIONS

At the outset, it is important to note that the information provided by the Corps in the DEIS and GRR is incomplete. I have done my best to review this project in light of the fact that a rigorous, independent review by the public of some of the key modeling issues is not possible at this time. Once the Corps releases sufficient information regarding the modeling to allow for such a review of important conclusions made in the DEIS and GRR on issues such as water quality and dissolved oxygen, I may choose to supplement this initial report.

Even with this caveat, having reviewed the relevant materials that have been made available, it is my professional opinion that deepening Savannah Harbor to -45 or -48 feet will

have a significant impact on the shortnose sturgeon (*Acipenser brevirostrum*), Atlantic sturgeon (*Acipenser oxyrinus oxyrinus*), and striped bass (*Morone saxatilis*) populations in the Savannah Harbor and that the impacts will be substantially higher than the level of impacts predicted by the United States Army Corps of Engineers (USACE) in the GRR and DEIS. The DEIS does acknowledge that the project will have impacts, but underestimates the potential environmental degradation of such a project and the associated adverse impacts on aquatic organisms. Fisheries experts with knowledge of shortnose and Atlantic sturgeon ecology have identified dredging as a contributor to their declining numbers and distribution, and future dredging of their habitat as an obstacle to recovery (NMFS 1998, ASSRT 2007, Federal Register Volume 75 61904-61929 Oct 6, 2010).

Additionally, previous USACE projects in the Savannah River estuary have severely underestimated environmental impacts to fish populations, including an unforeseen 96% decline in striped bass spawning and a 97% decline in striped bass fishing (Reinert et al. 2005) during the 1970-80's directly attributed to estuary modifications.

The estuary in the vicinity of Savannah Harbor is an important habitat for the Savannah River shortnose sturgeon and Atlantic sturgeon populations and is essential to their continued existence. The DEIS acknowledges this importance; yet, does not accurately estimate the effects of such a large-scale disruption to the estuarine habitat with a projected duration of up to six years. Researchers have concluded that Savannah River shortnose and Atlantic sturgeon have not been successfully reproducing, and most of the current population originates from stockings intended to boost the population to offset this lack of reproduction. The harbor deepening project will have significant negative effects on the health and survival of already endangered shortnose sturgeon and Atlantic sturgeon populations and will reduce their potential recovery by

(1) causing a reduction in available habitat and causing changes in summer and winter habitat selection with negative consequences likely; (2) requiring these species to find new foraging habitats if they avoid the project altogether or leaving these species without a source of food due to the elimination of benthic prey from the large-scale dredging; (3) causing these species to suffer physiologically from potential changes in water quality, including lower dissolved oxygen, increased turbidity and pollutants, caused by re-suspension of sediments, and increased salinity.

In sum, the Biological Assessment, included as an appendix to the DEIS, concludes that “the proposed project may affect, but is not likely to adversely affect shortnose or Atlantic sturgeon or their critical habitat.” Biological Assessment at 182. For the reasons described in my report, I strongly disagree with this conclusion. Accordingly, I recommend that the Corps and National Marine Fisheries Service (NMFS) engage in formal consultation and that the NMFS prepare a Biological Opinion.

Much of the rationale behind the conclusions regarding impacts to shortnose sturgeon and striped bass and the proposed mitigation listed in the DEIS is based upon modeling that parcels the estuary into sub-units instead of treating the estuary as an ecosystem in itself. The USACE appears to assume that the percent of a species’ habitat affected by the project as determined from modeling will have the same level of effects on a given species. Fish are not randomly distributed; thus, a loss of critical habitat that is small in area may impact a large proportion of the population. Fish typically select specific areas within the general useable habitat that will maximize health and fitness, and may utilize several areas throughout the year for different purposes. This is the case with shortnose sturgeon, Atlantic sturgeon, and striped bass in the Savannah River estuary. Shortnose sturgeon juveniles and adults, Atlantic sturgeon juveniles, and striped bass eggs, larvae, and juveniles all use specific areas in the estuary depending on

flow, food availability, salinity and dissolved oxygen. A small percentage loss of total available habitat for these species in the Savannah estuary can (and in this case are likely to) have large impacts.

Dredging and Sturgeon

The proposed ruling to list the Atlantic sturgeon as federally endangered and the shortnose sturgeon recovery plan specifically discuss dredging as a cause for endangerment and an obstacle to recovery for both species. The project will cause long-term habitat modifications that will likely change sturgeon distribution with potentially negative consequences. Collins et al. (2000) found shortnose sturgeon juveniles exhibited a switch in home ranges during the 1990's and attributed the distribution and behavioral changes to harbor modifications.

During 1988-1992, juveniles were concentrated in Kings Island Turning Basin. It appears that harbor modifications (deepening; tide gate removed from service; New Cut closed) since then have changed the hydrographic conditions and caused the fish to move from that area (Collins et al. 2002).

Dredging – Loss of benthic community

The effects of large-scale dredging over a 3-6 year period will likely have a profound negative effect on the foraging behavior of shortnose and Atlantic sturgeon. Sturgeon are known to be benthic (bottom) feeders. Thus, dredging has a major impact on sturgeon feeding behavior because dredging causes the elimination of the benthic organism community when the benthic substrate is removed. The DEIS acknowledges the immediate and complete loss of the benthic community in dredged areas. The benthic community will re-establish after some period of time, but the benthic community will not likely be comprised of the same quantity and quality of prey items as the pre-dredging community (Kenny and Rees 1996, Boyd et al. 2005). Re-colonization of dredged areas is dependent on several factors, intensity and extent of deepening and maintenance dredging, benthic species' life history and resiliency to disturbance, hydrodynamics

and water quality of affected area, and substrate type (Kenny and Rees 1996, Boyd et al. 2005, Szymelfenig et al. 2006). Re-colonization will likely take years considering 38 million cubic yards of material will be dredged across several years in order to deepen the harbor to -48 feet, and maintenance dredging will occur annually.

Shortnose sturgeon are not opportunists and only switch to other prey when preferred foods are unavailable, and research indicates that shortnose sturgeon are continuous feeders (NMFS 1998). Also, shortnose and Atlantic are reported to have different prey item preferences, but the adult shortnose and juvenile Atlantic sturgeon may compete for food (ASSRT 2007). Thus, the loss of preferred prey items or competition over limited resources will likely cause a habitat shift to alternative feeding grounds that may or may not provide adequate food or water quality. Increased energy expenditure in the form of increased movement to find other food sources and potentially poor nutrition from a change in prey items is likely to result in poor health, poor condition, and lower reproductive potential. If this occurs in a population already in low abundance with little to no recruitment, the effects would be severe to an individual, and detrimental to the population as a whole for both Savannah River shortnose and Atlantic sturgeon.

Dredging – Dissolved oxygen

The large-scale dredging is expected to cause a decline in dissolved oxygen concentrations. This is a major concern for all fish and aquatic organisms. The estuary is already impaired by low dissolved oxygen concentrations, as low as ~ 3 ppm during the summer. Most fish species require > 2.0 – 3.0 ppm dissolved oxygen levels for survival, and physiological impairment such as reduced growth and condition for many fish begins at < 5.0 ppm (Neill and Bryan 1991). This includes shortnose sturgeon (Jenkins et al. 1993, NMFS 1998, Campbell and

Goodman 2004), Atlantic sturgeon (Secor and Gunderson 1998, Federal Register 2010), and striped bass (Bain and Bain 1982, Coutant 1990). Dissolved oxygen needs are dependent on water temperature and life history stage of the organism. Increased temperature requires increased oxygen consumption by fish, and typically early life stages have higher oxygen requirements to support accelerated metabolism during these periods of rapid development.

Low dissolved oxygen, hypoxia, is also known to negatively impact aquatic invertebrates (Winn and Knott 1992). Hypoxia will in turn affect re-colonization of benthic organisms after substrate dredging. Re-colonization will take longer, and hypoxia may alter species presence and abundance after re-establishment (Szymelfenig et al. 2006). This will in turn affect sturgeon and other benthic fish feeding and nutrition. Further depletion of dissolved oxygen in the Savannah Harbor will likely have adverse impacts beyond those predicted in light of the importance of the estuary to juvenile and adult sturgeon and to all life stages of striped bass; the current impairment of dissolved oxygen concentrations in the harbor area; and the lack of confidence in the ability of the artificial oxygenation system expressed by federal agencies.

Dredging – Re-suspended sediments and pollutants

For fish and aquatic organism populations, a major concern for any dredging operation is the turbidity caused by re-suspension of sediments and the pollutants that may re-enter the water column after sediment exposure (Wilber and Clark 2001). The DEIS states that a sediment study was conducted to determine chemicals present in solid sediments. The study concluded that the only pollutant of concern is cadmium. The study measured levels of common organic, inorganic, and metals found in the Savannah Harbor sediments, but did not conduct actual exposure trials to pore-water where sensitive organisms such as shortnose sturgeon are exposed to waters

containing the re-suspended pollutants. Pore-water tests better reflect the toxicity levels organisms will encounter in the water than just solid sample surveys.

This should have been done considering the potential for the deposition of other un-tested uncommon pollutants from upstream and nearby facilities that may affect fish, and the general lack of knowledge on the sub-lethal and lethal effects of most common and uncommon pollutants that were found. Also, even if no single substance was identified at elevated concentrations, the many pollutants released from such a large amount of dredging materials being re-suspended may act in concert to create a harmful aquatic environment. In previous studies of Savannah River sediment toxicity, aquatic invertebrates experienced increased mortality (Winger and Lasier 1995, 2000). These studies indicate that SHEP will likely have substantial negative impacts beyond those stated in the DEIS.

In a recent study on the Roanoke River (Cope et al. 2010), researchers conducted exposure toxicity tests on shortnose sturgeon and fathead minnows. The results found that young shortnose sturgeon placed in the river suffered significantly higher mortality rates compared to sturgeon held in a controlled environment and also compared to fathead minnows exposed to the same riverine environment. Possible conclusions were that an identified toxicant with unknown effects on shortnose sturgeon was responsible; an untested or undetectable pollutant was present; or a synergistic effect of multiple pollutants makes the Roanoke River inhospitable for young shortnose sturgeon. Pollution in the form of toxicants is also listed as a reason for sturgeon decline and an obstacle to recovery (Federal Register Volume 75), and the effects of most pollutants on sturgeon species is not known. This may very well be the case with Savannah Harbor sediments, and proper testing is a reasonable expectation and should be conducted prior to the initiation of the project.

Dredging – Saltwater intrusion / increased salinity

Savannah Harbor deepening will allow the saltwedge to move upriver. Thus, saltwater intrusion will increase. This will increase the salinity of important habitats for juvenile and adult shortnose and Atlantic sturgeon, for striped bass spawning and early life stages, and the aquatic community as a whole, including freshwater marshes. Salinity affects ion/water balance in fish and aquatic organisms. Salinity preference and tolerance varies by species and between life history stages of a species, and determines habitat selection and ultimately organism community structure in an estuarine environment. Shortnose sturgeon juveniles prefer low salinity, and salinity tolerance increases with body size. Juvenile shortnose sturgeon salinity can tolerate up to 20 ppt, but suffer decreased energy and aerobic capacity, resulting in decreased growth and survival, as salinity increases (Jarvis et al. 2001, Jarvis and Ballantyne 2003, Zeigeweid et al. 2008). Atlantic sturgeon preference and tolerance is not well defined. Juveniles select lower salinity habitat, and adults are known to inhabit marine environments. Savannah River striped bass eggs and larvae are negatively impacted and experience mortality as salinity increases toward 15-18 ppt (Winger and Lasier 1994).

Also, benthic invertebrate and forage fish species presence and abundance may change with increased salinity. A change in prey species presence and abundance due to increased salinity, direct removal by dredging, and low dissolved oxygen will likely have profound impacts on the entire estuarine fish community, including shortnose sturgeon, Atlantic sturgeon, and striped bass.

MITIGATION ISSUES – FISHERIES

The SHEP DEIS has no mitigation directly targeting Atlantic sturgeon. The DEIS also lacks baseline information and an impact assessment on the Savannah River Atlantic sturgeon.

The National Oceanic and Atmospheric Administration (NOAA) recently proposed to list the South Atlantic distinct population segment (DPS) of Atlantic sturgeon, under which the Savannah River population is included, as endangered under the Endangered Species Act (ESA) (Federal Register Volume 75 61904-61929 Oct 6, 2010). Within the proposed ruling, dredging is listed as a contributor to their declining populations and an obstacle to recovery. The omission of discussion and impact assessment of a species proposed for listing as Endangered needs to be rectified. Even if there is a general lack of knowledge concerning the Savannah River Atlantic sturgeon population, the DEIS should state so in order to prompt research efforts to fill in the information gaps concerning population size and structure, spawning habitat selection, habitat selection of early life stages, and estuary use in the SHEP vicinity. The main focus of impact evaluation, mitigation, and funded research has been placed on the shortnose sturgeon for good reason; however, the Atlantic sturgeon has been neglected.

The DEIS incorrectly assumes that the life history and behavior of Atlantic sturgeon and shortnose sturgeon is so similar that the SHEP impacts and the mitigation package will have the same outcome for both species. For example, a recent study of juvenile sturgeon abundance on the Hudson River Estuary, has found that juvenile shortnose sturgeon prefer habitats upstream of the saltwedge (low salinity), while juvenile Atlantic sturgeon prefer habitats downstream of the saltwedge (higher salinity) (<http://www.amnh.org>). Other scientists have documented differences in life history (Kieffer and Kynard 1993, Bain 2002), including temperature selection (Niklitschek and Secor 2010) and spawning habitat preferences (NMFS 1998, ASSRT 2007). There will be some similar impacts, but there is a strong likelihood that the two species will also suffer differently in other ways. The mitigation package has placed all emphasis on shortnose

sturgeon. Atlantic sturgeon should be individually evaluated in terms of potential impacts and prioritized and targeted by mitigation actions.

As part of the SHEP mitigation package, the USACE has proposed a fishway at the New Savannah Bluff Lock & Dam (NSBLD) near Augusta, Georgia, 150 miles upriver of Savannah Harbor, as mitigation for damages to shortnose sturgeon habitat in the estuary. No mitigation could be identified within the estuary to offset the loss of critical juvenile rearing habitat. Thus, the fishway is a proposed trade-off intended to alleviate one major problem (impacts to important juvenile habitat) by allowing fish passage to upstream habitat. The problem is that although a fishway might provide some benefits to other species, this current proposal, without more, is highly unlikely to benefit sturgeon. In addition, the mere construction of a passage facility or the successful passage of fish upstream of an obstacle does not ensure spawning success or successful recruitment. A proper environment must be present above the obstacle to support spawning and the development of eggs, larvae, and juveniles. Also, the adults and the early life stages must be able to migrate downstream through the obstacle.

In this case, the DEIS does not demonstrate that the proposed fish passage design – the Horseshoe Rock Ramp – will have success at passing either species of sturgeon or that environmental conditions above NSBLD will support sturgeon spawning. Thus, it is uncertain if the fishway in itself will actually improve sturgeon spawning success. Even if it could be demonstrated that this design will work here, future modifications will likely be necessary to specifically accommodate sturgeon species. These changes would likely substantially increase the cost of the fish passage facility, and additional funding would be needed up front to ensure proper maintenance in perpetuity. The fish passage proposal would certainly require far greater levels of committed funding than currently proposed, and even then, it is uncertain that the

Horseshoe Rock Ramp design will work in this situation to address impacts to both species of sturgeon.

Further, the DEIS does not include a detailed fish passage plan as part of the proposed mitigation actions to offset impacts to shortnose sturgeon. There is no comprehensive fish passage plan listing objectives and goals for the species expected to benefit from the facility, including shortnose sturgeon. Whenever a new fish passage facility is proposed, there is a precedent for a fish passage plan to be completed. This has been a vital part of many recent FERC re-licensing cases across the United States. These fish passage plans typically list how many of each fish species will be passed and a list of recruitment goals with specific numbers. The SHEP DEIS only discusses the general objective of passing fish at NSBLD. A fish passage plan is a reasonable expectation given this is a standard practice for the construction and operation of new fish passage facilities nationwide.

The most effective mitigation action would be the complete removal of the NSBLD along with all other dams/obstructions upstream to J. Strom Thurmond Dam (JST) and those in the Stevens Creek Basin, a major tributary entering the Savannah River between JST and the City of North Augusta in combination with a flow schedule promoting biological integrity. This would eliminate any obstruction to migration of all life stages. Also, no long-term costs would be incurred for continued operation of the obsolete Lock and Dam nor a fishway. Moreover, the removal of this dam would have the benefit not only of providing access to habitat upstream, but it would allow more natural riverine processes that may provide suitable habitat for sturgeon.

The mere installation of a fishway at NSBLD falls well short of providing the necessary habitat conditions for successful reproduction and recruitment once a fish has bypassed NSBLD, the ultimate goal of the mitigation plan for shortnose sturgeon. Once fish successfully pass

NSBLD, they will likely select the “Augusta Shoals” for spawning habitat. The Augusta Shoals may provide adequate spawning substrate, but flow will be paramount. However, there will be periods when the necessary flows in terms of discharge amount and natural temporal availability will not be provided under flow-release schedules from JST. This is particularly true during periods of drought, which have been increasingly common in the Savannah River Basin. Drought conditions have prompted the USACE to take water management actions in the form of reduced flow from JST to conserve reservoir storage (USACE 2010a). These flow reductions impact the Savannah River’s hydrology and biology from JST to the estuary. Conditions at the Augusta Shoals are further complicated by the fact that the City of Augusta diverts a significant portion of the flow into the Augusta Canal, substantially reducing flow for fish and aquatic organisms. Also, reduced freshwater flow will increase saltwater intrusion negatively impacting freshwater marshes and altering aquatic habitat conditions in the estuary. Reduced freshwater flows and increased depth of the estuary at Savannah Harbor will act in concert to worsen the saltwater intrusion.

If and when sturgeon and other fish species pass NSBLD, they are assumed to find better spawning habitats above Augusta, GA. However, proper flows are not ensured because the USACE has yet to finalize and adopt a strict comprehensive flow plan to promote diadromous and freshwater fish reproduction and recruitment below Thurmond Dam. Also, the City of Augusta has recently agreed to release a minimum of only 1,500 - 1,800 cfs during low flow periods (USACE 2010a, b). The USACE does not increase flow to offset the water diversion by the City of Augusta. So, even if USACE releases low flows of 4,000 or possibly 3,100 - 3,600 cfs during droughts to conserve reservoir storage, only 1,500-1,800 cfs will be present for fish spawning.

Several agencies, academic institutions, and organizations have addressed this issue of improving river flow and water quality in the middle and lower Savannah River including the estuary to benefit fish and aquatic organisms. Flow recommendations were developed during the 2003 Savannah River Flow Workshop (Duncan and EuDaly 2003). The 1,500 – 1,800 cfs minimum flow is much lower than the recommended flows stated in the 2003 workshop's river flow prescription.

Furthering the discussion of flows for fish populations, the USACE and state agencies have an agreement that pool elevation stability in the reservoirs themselves for largemouth spawning should be a priority in water management decisions (USACE 2010a). This appears to signify that freshwater sportfish populations in the reservoirs have priority over reproduction of threatened and endangered diadromous and freshwater species in the Savannah River below the USACE projects.

The mitigation proposal should include a mandated priority to provide adequate flows as suggested by the previously sponsored workshops to support fish populations and to improve the biological integrity of the Savannah River from JST Dam to the mouth. In my professional opinion and experience researching the fish populations in the Savannah River, along with conclusions from other scientists involved in studies of Savannah River ecology (Duncan et al. 2003, Marcy et al. 2005, Grabowski and Isely 2007), this is of paramount importance to ensure successful mitigation, and should be implemented as mitigation.

Flow releases from Thurmond Dam affect the Savannah estuary salinity and hydrodynamics (Duncan and EuDaly 2003). Thus, final adoption of the flow prescriptions from the Savannah River Basin Comprehensive Study (Duncan and EuDaly 2003) is a viable mitigation action. Re-establishing access to historical spawning habitat in combination with

ensuring the presence of proper environmental conditions, including flow, for all life history stages of fish and aquatic organisms should be part of the mitigation package.

As part of the SHEP, the USACE has proposed to fund the enhancement of Georgia DNR's striped bass aquaculture program as mitigation for damages to striped bass. However, the USACE will only fund at a 20% spawning habitat loss level. This proposal holds some merit as a last resort restoration strategy, but the program will likely need to be expanded as impacts to spawning habitat will likely be greater than predicted. Supporting evidence comes from the fact that the USACE underestimated impacts from estuary modifications to the striped bass population in 1970 - 80's. The Tide Gate and Diversion Canal installed in the late 1970's and operated through the 1980's caused a 96% decline in striped bass reproduction, prompting a moratorium on striped bass fishing and harvest for an extended period of time. This was due to increased saltwater intrusion and hydrodynamic changes negatively impacting spawning and the survival of early life stages (Reinhart et al. 2005). A major re-stocking effort was needed to rebuild the population. The USACE should anticipate funding at a 100% loss level given their gross underestimation of damages to the striped bass population due to previous activities/modifications.

The DEIS fails to acknowledge and discuss that there is evidence of two distinct subpopulations of striped bass in the Savannah River, an estuary-spawning and a non-estuary spawning subpopulation, and both may use the estuary as nursery habitat (Martin and Paller 2007). The USACE does not account for the potential impacts on the non-estuary spawning subpopulation. The mitigation proposed would only address the estuary spawning subpopulation. The stocking program will likely need to be revised to account for differential

impacts and restoration strategies for these two sub-populations that may utilize somewhat different life history strategies within the Savannah River.

The stocking program should ensure striped bass broodstock are of Savannah River genetic origin. Genetic testing should be conducted before annual aquaculturing occurs. The Savannah River striped bass are known to be genetically distinct from other river systems. Striped bass in the many Atlantic and Gulf Coast rivers have some distinct physiology and behavior that increases success in the natal system (Secor et al. 2000), but may be a liability in restoring populations with genetics outside the natal system.

The USACE plans to implement an artificial oxygenation system to remedy the low dissolved oxygen concentrations already found in the Savannah Harbor vicinity that are anticipated to worsen with SHEP. Although the DEIS discusses a trial run of the system with some purported success at raising dissolved oxygen concentrations ~0.5 ppm, some governmental agencies express significant reservations with respect to its effectiveness and cost over a 50-year period (DEIS Appendix E). Also, USACE underestimated dissolved oxygen losses from the last harbor deepening to -42 feet (EPA Informal Comments on Preliminary SHEP DEIS September 10, 2010). I share these concerns because such a system has not yet been proven reliable over such an area and time period.

Conclusions

- SHEP will result in adverse modification of critically important habitat for Savannah River shortnose and Atlantic sturgeon.
- The SHEP will directly reduce the likelihood of both the survival and recovery of shortnose and Atlantic sturgeon by reducing the reproductive fitness, numbers and distribution of each species.

- Baseline conditions in the Savannah River have already eliminated successful reproduction and caused a severe decline in shortnose and Atlantic sturgeon populations; thus, further habitat destruction or modification from SHEP will cause additional harm, jeopardizing the existence of shortnose and Atlantic sturgeon populations.
- The DEIS should be revised to include detailed discussion of impacts to Atlantic sturgeon.
- Pore-water toxicity tests should be conducted to determine effects of sediment re-suspension on organisms in the vicinity of Savannah Harbor.
- SHEP will likely have greater negative impact on striped bass than predicted in the DEIS.
- Revisions to the SHEP mitigation plan are needed to include other beneficial actions, and funding for mitigation must be increased and pre-approved in its entirety.

In summary, my professional opinion is that the Savannah Harbor deepening project will have greater impacts to fish and aquatic organisms than the level anticipated by the USACE. I further disagree with the conclusion reached in the Biological Assessment that “the proposed project may affect, but is not likely to adversely affect Shortnose or Atlantic sturgeon or their critical habitat.” Biological Assessment at 182. Accordingly, I recommend that the Corps and National Marine Fisheries Service engage in formal consultation and that NMFS prepare a Biological Opinion in connection with this action. Also, alternative mitigation actions need to be explored to further offset adverse impacts and to maximize the benefits of the proposed mitigation. The anticipated funding level should be raised to a level commensurate with the extent of anticipated impacts and it should be ensured that sufficient funds are available and not made subject to federal appropriations to provide mitigation for a worst case scenario. Finally,

as more information is made available to the public regarding this project, I reserve the right to supplement my opinions.

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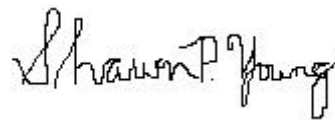
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Respectfully submitted,



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