BEFORE THE ENVIRONMENTAL APPEALS BOARD

FOR THE STATE OF DELAWARE

SIERRA CLUB, Assawoman Canal Appellant,	)	
v.	)	Appeal No. 2004-03
SECRETARY OF THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL, CONTROL OF THE STATE OF DELAWARE, Appellee.	)	

FINAL ORDER AND DECISION

Pursuant to due notice of time and place of hearing served on all parties in interest, the above stated cause came before the Environmental Appeals Board on February 22, 2005, and was continued on March 22, 2005, at its meetings in the Auditorium, Richardson & Robbins Building, 89 Kings Highway, Dover, Kent County, Delaware. This matter was concluded on May 10, 2005 when the Board deliberated and voted on the matter.

PRESENT:

Nancy Shevock, Chair

Stanley Tocker, Ph.D., Member

Peter McLaughlin, Member

Gordon Wood, Member

Harold Gray, Member

Kevin Slattery, Attorney for the Board.

APPEARANCES:
Kenneth Kristl, Esquire, for the Sierra Club.
Robert Phillips, Deputy Attorney General, for the Agency.

Subsequent to the Board's deliberations and vote in the above captioned matter, and prior to the issuance of the Board's final decision and order in this matter, the General Assembly of the State of Delaware passed section 81 of Senate Bill 190—the fiscal year 2006 bond bill. This section reads as follows:

> *Assawoman Canal Dredging. It is the express finding of the General Assembly that the benefits of dredging and maintaining the Assawoman Canal exceed the costs of such project and the Secretary of Natural Resources and Environmental Control is hereby directed to initiate all necessary actions to dredge the Canal pursuant to all terms and conditions provided for in the state and federal permits issued for the project and initially authorized by Secretary's Order 2004-W-0047 dated August 12, 2004.*

As a result of this action, the Board conducted further deliberations on this matter on July 26, 2005 to consider the potential effects of the General Assembly's action relative to the appeal. The General Assembly's pronouncement on this matter may raise issues of import under both the Constitutions of the United States and the State of Delaware. The Board recognizes that the consideration of such issues may be outside its purview. Furthermore, as the interaction between the Board's statutory authority and the General Assembly's pronouncement in section 81 of the Bond Bill is not entirely clear, the Board chooses to continue in its role consistent with its enabling statute and issue its decision and order in this appeal.

Before the Environmental Appeals Board ("Board") is an appeal by the Sierra Club opposing the Secretary's order granting permits to the Division of Parks and Recreation for the dredging of the Assawoman Canal ("the Canal") and for the disposal of dredge spoils.

I. Opening Statements

The Sierra Club contends that both the process and Secretary's decision are fundamentally flawed. The Sierra Club contends that the Secretary acted arbitrarily and capriciously. All the parties are within the Department of Natural Resources and Environmental Control ("DNREC" or "the agency")--Parks and Recreations, Soil and Water Conservation and the Secretary. DNREC failed to determine impacts on water quality in contravention of its Regulation 3.01(B)(1)(a).[1] Water quality in the Canal already violates several water quality standards. The improved flushing contended by DNREC that will occur from the dredging will not occur. Prior studies show that the dredging will decrease water quality or that the data is insufficient to show that flushing will occur. DNREC is aware of the insufficiency of the data and they refuse to conduct the necessary comprehensive study to determine the impacts. DNREC failed to determine whether there will be significant impacts on a biologically productive area. Regulation 3.05(D)(1) forbids dredging in such biologically productive areas. DNREC has not done the studies to determine the impacts on various fish species, the diamondback terrapin and benthic organisms. DNREC failed to determine the environmental impacts in contravention of regulation 3.05(B)(1) and (2). There is a significant potential impact from shore erosion. There is a significant impact on the disposal site because there is a "forest" at the site that will have to be removed. DNREC's solutions are inadequate. The no-wake zone requirement is not required to

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[1] Reference is to the agency's subaqueous lands regulations entitled *Regulations Governing the Use of Subaqueous Lands* ("Regulations") promulgated May 8, 1991 and amended September 2, 1992.

be strictly enforced and there are no enforcement monies available to do so. Finally, DNREC did not conduct the proper economic analysis necessary to show the benefit to the public of this project in contravention of regulation 3.05(B)(3).

The Sierra Club seeks the Board to either deny the permit or to remand the matter back to the agency to follow its own regulations.

The agency contends that it is conducting maintenance dredging. The dredging will be conducted on 60% to 70% of the Canal. Areas have shoaled or are very shallow. Regarding the economic analysis, the agency "considered" the evidence of costs and benefits. There is no requirement that DNREC perform a cost/benefit analysis pursuant to the Army Corps of Engineers ("ACE") standards. The General Assembly did not require the costs to outweigh the benefits. Sierra Club must show the Canal is a biologically productive area and that there will be significant and lasting detriments to these areas. DNREC will show the effects will be temporary. DNREC followed the methodology for the dredging of inland bays. This is a man-made waterway that was previously dredged.

II. Summary of the Evidence

A. *Appellant's Case*

1. Upon agreement of the parties, the Board considered the testimony of Mr. Carl Solberg from the hearing conducted on April 13, 2004 in this matter's predecessor (*Sierra Club v. Secretary of the Department of Natural Resources and Environmental Control*, Appeal No. 2003-07)("*Assawoman Canal I*").

Mr. Solberg testified that he has been a member of the Delaware Chapter of the

Sierra Club since 1977. He has canoed in the Canal since 1994. He has taken his family and other members of the Sierra Club on outings in the Canal, Salt Pond and White Creek. He has been in the Canal approximately eight to ten times. He goes there to avoid motorcraft. The dredging will do away with his reasons for using the Canal. It will increase turbidity and he will not be able to view the aquatic wildlife in the clear water he enjoys.

2. Upon agreement of the parties, the Board considered the testimony of Ms. Michelle C. Adams from the hearing conducted on April 13, 2004 in this matter's predecessor (*Assawoman Canal I*).

Ms. Adams testified that she has a B.S.E. and has completed some graduate level work. She has 20 years experience as a water resource engineer. She is a licensed engineer in Delaware, Pennsylvania, Virginia, Maryland and North Carolina. She is currently employed by Cahill Associates in West Chester, Pennsylvania as a principal engineer. She has appeared in cases as an expert witness approximately 4 to 5 times a year for the past ten years. She has appeared 75% of the time on behalf of the plaintiffs and the other 25% on behalf of the defendants.

The witness reviewed several documents either prepared by DNREC or sent to DNREC from the Army Corps of Engineers ("ACE"). Her primary conclusion is that the assessment report tried to determine the mixing results in the Canal. DNREC looked at several different models, but it could not perform a full modeling analysis due to inadequate data and funds. The agency tried to come up with an estimate. It tried to use a HEC model--a gravity model. The movement of the water is due to a "slushing" effect caused by tidal effects. Dredging a foot lower is not going to improve the water

quality in the Canal as it will not have a great effect on the tidal movement. Even DNREC (in a response document dated April 17, 2003) admits the dredging "may" improve flushing in the Canal and will not improve the water quality in the lagoons in South Bethany. The movement of the water is tidal and will not introduce the type of oxygenation and other effects associated with flushing. Her conclusions are memorialized in Sierra Club Exhibit No. 7.[2]

The witness further testified that the increase in boat traffic that is anticipated will stir up the bottom sediments and detrital material. If the no-wake requirement is not enforced, there will be erosive effects on the banks. The channel does not have the hardened sides found in channels used to a lot of water movement. The additional watercraft traffic will have a negative effect on the Canal by both stirring up sediments and from the erosive effects on the sides. There will be an effect on the health of the fish due to the increased turbidity and the length of time the turbidity is in effect. Increased development is the number one impact on water quality due to the pollutants caused by the runoff. The development will increase nutrients and sediments. The nitrogen comes from fertilizers and the atmosphere when it hits paved surfaces. There are also the effects from oils and pollutants from the watercraft engines themselves. The increased nitrogen and phosphorus cause the increase in phytoplankton. The Canal already has high nutrient levels. The dredging of the Canal will provide no benefit on water quality. It will have an overall negative benefit from a lack of mixing, the increased boat traffic and the clearing and disturbance of land for access to conduct the dredging. DNREC itself indicates that the water quality will overall deteriorate by the

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[2] Reference is to the exhibit introduced during the *Assawoman Canal I* hearing.

dredging (see Exhibit No. 8).[3]

On cross examination, Ms. Adams testified that conditions in the Canal are similar to those in the inland bays in the sense that it is nutrient rich and low in oxygen levels. Further sampling and modeling would be necessary to achieve a better idea of the impacts. The most significant factor in her analysis is that she could not find any improved flushing.

On re-direct examination, the witness testified that there was very limited sampling data. Most of the data came from the modeling. It was not adequate for her review. The report itself recognizes this limitation. She would have benefited from additional sampling and modeling data. The negative impacts are going to be greatest from the increased boat traffic with the resulting increased turbidity and erosion.

On examination by the Board, the witness testified that she is not aware of any studies that show increased boat traffic improving water quality. She is not aware of any water depth measurements being conducted at either ends of the Canal. This would be necessary to conduct flow studies, and she is not aware of such studies done here. There was a dye study done in the 1970's. The conditions in and out of the Salt Pond loop are undetermined--there is no data.

3. Upon agreement of the parties, the Board considered the testimony of Dr. Robert N. Stearns from the hearing conducted on April 13, 2004 in this matter's predecessor (*Assawoman Canal I*).

Dr. Stearns testified that has a B.A. in mathematics and a Ph.D. from Yale in economics. He is a member of the American Economic Association. He is a retired

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[3] See footnote 2 *supra*.

federal employee. He does some consulting and teaching (economics). He spent 20 years with the federal Department of Transportation and then the ACE civil works program. His last assignment was as the Deputy Assistant Secretary of the Army for Civil Works. In his capacity with the ACE he reviewed thousands of cost/benefit analyses and rendered independent opinions regarding various projects. He primarily reviewed transportation projects--navigational projects. He most recently did analyses of the deepening of the Delaware River, the Red River and the intra-coastal waterway. He has been called as an expert before the Interstate Commerce Commission. He has worked for a number of environmental interest groups.

Dr. Stearns testified that in connection with this case he reviewed the material submitted during the public comment process. He initially reviewed the assessment report and the subaqueous lands regulations (he reviewed other documents at a later time). From those two documents he expected to find some form of cost/benefit analysis but did not. He found references to the possible beneficiaries, but he could not find any quantitative costs or benefits. He then went to the regulations. He concluded from his review of the regulations that a cost/benefit analysis should have been conducted. If one is going to compare benefits to costs, you need a quantitative analysis. This was not performed during the public comment period. The data was not there. He sent a letter to the Sierra Club dated November 6, 2002 expression this finding. (Sierra Club Exhibit No. 2).[4]

The witness further testified that he was later asked to look at the Assawoman Canal economic analysis (dated January 22, 3003). He looked also at the dredge

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[4] See footnote 2, *supra*.

evaluation document from October of 2001 (Sierra Club Exhibit No. 11).[5] He also read the background material on the ACE methods for evaluating recreation projects. This includes the evaluation guidelines for the Water Resources Council. The latter refers to the former.

Dr. Sterns testified that in his review of the January 22, 2003 document he found two very significant application issues by using the ACE methodology. Both issues lead him to believe the benefits were overstated. The most important factor is that for existing users there was an analysis of net benefits, but there was no analysis for future users. One needs to assess net benefits, not gross benefits, to make the determination. This caused the agency to overstate the benefits of the project. The authors also subscribed to the boat owners at the Harborview Marina a high "willingness to pay" value--the specialized category usually associated with big game hunters or rock climbers, etc... He would have assigned the same value to all users—"general recreation activities". This also caused the agency to overstate the benefits of the project.

The witness went through his chart on how the unit/day method is utilized to determine the cost/benefit analysis. A point score is assigned to each of the quality-of-experience factors. That quality-of-experience is first converted to a dollar value per person, and then assigned a value per experience. This is repeated for the "without project" conditions. When the "without project" value is subtracted from the "with project" value, you get the net value. Future costs and the length of the life of the project are accounted for in a discount rate. The Office of Management and Budget

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[5] See footnote 2, *supra*.

("OMB") uses a 7% discount rate, and that would be the rate he would use for this project. The ACE analysis assumes a 50 year project life. If 50 years is not a reasonable period of time, than there are other factors to consider.

The witness indicated the value of the canal to those living north of the Canal is not as great as to those living south of the Canal. The primary issues he found in reviewing the agency's economic analysis were the use of the gross benefits versus net benefits and the high willingness to pay factor to the marina users. Another factor not taken into consideration was the difference in use between the weekend users and the weekday users.

If the cost/benefit analysis is close, one must look at the environmental costs. The agency did not do this. A distinction is made between the economics and environmental costs. As an economist, he views the economic costs as the primary costs, but this does not mean the environmental costs are not equally important. The agency did not follow the ACE methodology. Sierra Club Exhibit No. 11 is very close to the ACE methodology. In looking at section 6 of this exhibit (specifically pages 6.1 to 6.5 and Appendix B), the Appendix speaks of unit values. Unit/day values are used to evaluate both benefits and costs. The regulations are referring to the unit/day method of the ACE. The economic analysis did not follow the Delaware methodology contained at Sierra Club Exhibit No. 11. Referring to Sierra Club Exhibit No. 3, the witness testified that the $250,000 cost estimate for the project does not include approximately $71,000 spent by the agency in attempting to obtain permits for the project.

The witness testified that in his opinion, more information is needed to determine whether the economic justification is present for this project to go forward.

On cross examination, Dr. Stearns testified that environmental concerns are outside his area of expertise. The subaqueous lands regulations require consideration of both economic and non-economic factors. Here, the agency considered them, but he did not like the methodology it used. It is more difficult to assign a dollar value to recreational projects than to commercial projects. He was asked to determine whether the consideration of the economics was "adequate". He compared this primarily with the ACE methodology. He is aware the ACE granted a permit for this project.

On examination by the Board, the witness testified that the ACE permit does not necessarily contain a cost/benefit analysis. He tried to recreate the analysis using the general recreation category, using net benefits, a 50 year life expectancy for the project, a 7% discount rate and some variations based upon greater usage from south to north as opposed to north to south. In his result, he came up with a .98 ratio which is very close to 1. He did not review the costs and forecast costs. He did not add anything by incorporating the canoe and kayak users. He would not include the older costs--the approximately $71,000--in his project costs.

4. The Board considered the testimony of Mr. Steven E. Callanen. Mr. Callanen testified that he lives in Ocean View, Delaware. He has lived there since 1997. He lives approximately 2.5 miles from the Canal. Since 1957, his parents vacationed in Bethany Beach every summer. He and his father fished and crabbed from the bridges over the Canal. As an adult, he and his family vacationed there as well. He has hiked along the shore of the canal and boated on the Canal on several occasions. He has been a member of the Sierra Club since 1998. He has been involved in the hearing process of the Canal dredging project and reviewed many documents related to the project. He

has written letters to the editor of newspapers regarding this project. He has read extensively on the benthos and fish communities for the Canal. He has spent hundreds of hours gathering information about the project. He contacted many individuals related to this project including Bill Moyer, John Maxted, and Chris Lesser of DNREC. He also spoke with representatives of the ACE, the U.S. Coast Guard, the University of Delaware (Drs. Whereat, Price and Ullman), the University of Maryland (Dr. Fanning), the Virginia Institute of Marine Sciences, the EPA and NOA.

The witness testified regarding the water quality concerns of the Sierra Club. The Sierra Club feels the inland bays water system is stressed and degraded and that the dredging of the Canal will further distress this system. [Sic] The social and economic benefits of the project outweigh the environmental impact considerations. Not enough attention has been given to the long-term and indirect impacts. He submitted FOIA requests to DNREC about water quality. Memos from Bill Moyer (in 1986), John Schneider, and John Maxted raised issues about water quality related to the project. He contacted John Whereat at the University of Delaware, whom he considered one of the experts on water quality. He contacted another professor at the University of Maryland who is also an expert in this area. He encouraged Dr. Whereat to submit information related to this project. Dr. Whereat submitted the letter in Sierra Club Exhibit No. 32. His understanding of this exhibit is that there was not adequate data to draw any conclusions related to water quality resulting from the dredging of the Canal. Regarding Sierra Club Exhibits Nos. 24, 25 and 26, these are other documents he obtained from FOIA requests. The witness testified that he has not found any documents from DNREC responding to these documents.

The witness further testified that there are issues related to shoreline erosion from motorized boat traffic. There are also impacts to the overhanging vegetation that provides shade to the Canal, and impacts to the benthic and fish communities. Because so much time has passed since the last dredging, the Canal has reverted to a natural state and this project is no longer just maintenance dredging. The Canal has a unique ecological function and deserves special treatment which it is not receiving.

The witness testified he spoke with Tim Goodger who is a scientist with NOA--a habitat group in Maryland. He encouraged Mr. Goodger to submit information related to the dredging. Regarding Sierra Club Exhibit No. 31, this is a document he found from DNREC in his FOIA request.

As to the shoreline erosion issue, the witness testified that the Canal is only 200 to 210 feet wide. The original dimensions were to be 70 feet wide and 6 feet deep. This never occurred. The shoreline is already badly eroded. He saw the roots from the trees overhanging the Canal. On one person's property that abuts the Canal, he noted one to two feet of erosion in ten years. The dredging will cause further erosion.

As to the loss of shade, the witness testified that the shade prevents the water from warming up as quickly during the summer months. It also relates to the juvenile fish. About one mile of trees will be removed north of the Canal to allow for the equipment to gain access. These issues were raised to DNREC. This is in Sierra Club Exhibits numbered 31, 32, 24 and 25.

As to disposal impacts, the witness testified that he has visited the combined disposal facility ("CDF") #1. It was listed as a degraded site with the only vegetation as "shrubs". The only area he could find was a 2.5 acre parcel of loblolly pines up to 18

feet high--a small forest. He observed the aerial photographs of the site at the Department of Agriculture and they also did not match DNREC's description of the site. He saw Dr. Phillip King take soil samples from the site, and the soil was dark and rich. Dr. King's report is in the record before DNREC.

On cross examination, Mr. Callenan testified that he spoke to individuals regarding the transfer of the Canal to the State. He was aware that the stated purpose was for recreational purposes, including boating and dredging. He does not dispute that the application indicates these purposes would have been continued. The Canal is man-made and its natural state would have been a field. He is not aware if any of the experts he referred to are Sierra Club members or not. The witness indicated that the dredging plans have changed since Exhibits 24, 25 and 26 were prepared. This includes a lower dredging depth and mitigation measures. In the assessment report, the witness identified paragraph 2 of page 4 as his source for the contention that a mile of trees along the Canal will be removed to facility. Mr. Callenan testified that he has a boat he keeps in front of his house. The area in front of his dock was dredged in the 1980's. He has used his boat on end of the Canal. He believes there are shallow spots in the Canal. His boat is a sailboat and he would not use it on the Canal. He has seen another disposal site that looks like a "moonscape".

On re-direct examination, the witness testified that regarding mitigation efforts, Dr. Allmond submitted additional evidence in 2002 letters in which his testimony did not change.

On examination by the Board, the witness testified with regard to Sierra Club Exhibit No. 33—his photographs of the CDF #1 site. He took them in October, 2002.

They show Mr. King, USDA soil scientist, taking soil samples, and they also show the sides of the loblolly pine trees. The site is adjacent to the electrical substation.

5. The Board considered the testimony of Mr. William F. Moyer

Mr. Moyer testified that he is present pursuant to a subpoena request. He has a MS in environmental engineering sciences in addition to numerous post-graduate courses in a variety of environmentally related subjects. He was the WSLS manager and was with this section for 28 years. He reviewed permits for the Director of the Division of Water Resources who reported to the Secretary of DNREC.

Mr. Moyer testified that the permit review process involves the submission of the application for review. If it is complete, it is put on public notice for a 20 day period. Once comments are received, it is reviewed by staff people, and a decision is made to issue or deny the permit with or without conditions. In regard to this permit, the applicant was the Division of Parks and Recreation. The application listed the Division of Soil and Water Conservation as the agent for the dredging. In the normal course, he would be the one to issue or deny permits. That procedure was different here because a public hearing was requested. Therefore, a hearing officer made a recommendation to the Secretary. He attended the public hearing and prepared the memo dated August 5, 2004 (Sierra Club Exhibit No. 30).

The witness testified that in 1992 he served on the Governor's task force to review the inland bays. He also was on a task force pertaining to recreation on the inland bays. The task force identified certain areas of the inland bays that should not be dredged. Prior to this, the State dredge was used at the "whim" of the General Assembly. A plan was developed to control the State dredge and areas where the

dredge could or should not be dredged. A color-coded dredge plan was developed. There were areas off-limits to dredging indicated in red. These were shallow tributaries to the inland bays—creeks and streams. Channels that had been routinely dredged over the years for navigation purposes were classified as green. Yellow areas would require additional study. The Assawoman Canal was coded as green. Former Secretary Wilson came into one of the meetings and specifically indicated the Canal would be coded green without any further study required.

The witness further testified he prepared an August 18, 1986 memo (Sierra Club Exhibit No. 34) in response to Mr. Lesser's study (Sierra Club Exhibit No. 13). This study indicated the fishery impacts of dredging on the north and south ends of the Canal. He reviewed these impacts as part of the Canal dredging project. His comment about impacts in the last paragraph of the memo is typical for any dredging project. The positive impacts should outweigh the negative impacts. His reference to a "complete environmental impact statement" meant the impacts on the physical setting, the short and long term impacts on the ecology and the living resources of the area--benthic, fisheries, and invertebrates, short and long-term water quality, economic costs and benefits of the project and the positive and negative impacts on the public. In regard to Mr. Lesser's study, no analysis was done to determine whether his recommendations to improve the Canal could be met if the dredging were to take place. Mr. Lesser suggested that the problems would be addressed if they occurred.

Mr. Moyer further testified that there was at least one meeting with the former Secretary (within the last 6 to 8 years) to discuss the Canal dredging. It was made clear that the General Assembly funded the project, that the Governor wanted it done, and

that the project would go forward. This meeting did not influence his August 5, 2004 memo. Statements by the Secretary indicated that the permitting process would not be circumvented. There was a reluctance to expend a lot of staff time to prepare the environmental assessment. They probably did not put as much time into this as they would for a private applicant. They were not going to make a recommendation--just findings. It was not as thorough a decision as it could have been had they collected additional information. Had it been a private application they would have required several collection stations for benthic organisms, the chemical analysis of sediments, the determination of the water quality in the canal, the determination of non-point source run-off, and a thorough hydrological flow-through analysis to determine flushing effects. For the Canal, they established the same parameters but left it up to the applicant to develop the assessment and then accepted that assessment. Each dredging project is different. The Canal is unique because it is man-made. Whether additional information would have resulted in a decision based on better science or not is undetermined. He is not sure the biological or ecological data that could have been collected is as important as some other impacts to the Canal. No increased collection of biological or ecological data would assist in making those determinations.

With regard to the August 5, 2004 memo (last full paragraph on page 4—Sierra Club Exhibit No. 30), the witness testified that increased navigation would mean that motorized boating would increase on the Canal. They made efforts to determine whether canoeists or kayakers would use the Canal less with the increased boating traffic. They determined that certain times of the year be set aside for non-powered boat users (from November to February). The last suggested permit condition was for

staggered usage, however, it was not adopted into the permit itself.

As far as the negative environmental and public interest effects of the project, the witness testified that the Canal may be compared with a dead-end lagoon. The negative effects will come from the instability of the sides of the lagoon which are very steep with almost no vegetation. Without a no-wake provision, the banks will slough and the Canal will have to be dredged again. The sloughing and the pollution from two-stroke engines are the two most serious environmental effects. The shallow depth of the canal will redistribute sediments, so that the restoration of the benthics will be affected. The conflict between the motorized and non-motorized users will result in a difficult situation for the agency to address. There could be confrontations and increased requests for the agency to intervene in those confrontations.

The witness testified that he had concerns on the water quality. Initially there was hope the increased water depth would increase the flushing in the Canal. The studies showed no such flushing and the potential for poor water quality in the Indian River Bay to find its way into the Little Assawoman Bay which has a better water quality. The increase in boat traffic increases the possibility of boat sewage entering the Canal. The assessment report made a comment that it is unlikely that the size of the boats in the Canal would have heads--and that seems reasonable. There will be increased turbidity during the dredging. There will be no way to prevent a larger boat from entering the Canal and stirring up bottom sediments. This will also cause wake that will affect the banks of the Canal. As to surface and groundwater hydrology, the witness testified that a simple model was used and not the type of model recommended by his water quality people. This was because of the cost of the modeling. A better model

would have given better information. He had concerns about the modeling results not being conclusive as to whether the dredging would improve flushing. His primary concerns, however, were with bank issues and conflict issues due to the increased boating use. The latter were more significant than the flushing issues. The process of collecting more and more data on the impacts will only lead to more and more debate. Scientific data often does not lead to answers that common sense will. The no-wake limit will be the concern. It will be too difficult to enforce. The banks will slough. If this occurs, it won't matter how many studies are done--then they will be useless. The boating conflicts—especially if jet skiers want to use the Canal--will undo the benefits of the project. The permit requires the posting of no-wake speed limits. It does not require the enforcement of those no-wake zones.

On cross examination, Mr. Moyer testified that it is not unusual to have public hearings on environmental matters that are controversial. The terracing referred to by Lesser would be done in the water. Most of the areas that have the steepest banks are not the areas that have the canopy overhanging the Canal. An environmental impact assessment was done by State standards. It was re-done four times since the original permit expired. This was due to the number of issues being raised and to mitigate environmental impacts. The process should have been driven internally by the agency and not by outside groups. One of the original purposes of dredging the Canal was to improve the water quality in the dead end lagoons in South Bethany Beach. It is not one of the purposes in the present permit. He is not certain that DDT was one of the chemicals above the acceptable maximum limits. The Canal project was intended to improve recreational boating activity. On the land, there will be bike paths. On page 4

of his report (Sierra Club Exhibit No. 30), he was careful not to say that the increased recreational activity on the Canal would be for motorized vessels. There has been some spot maintenance dredging on the Canal over the years. He has no information to confirm or deny that the Canal was dredged in the late 1950's. In the late 1950's only an ACE permit would have been required to dredge the Canal.

The witness testified on further cross-examination that DNREC must make the judgment calls between positive and negative impacts. Secretary Hughes recused himself from the decision-making process for this project. There have been three public hearings related to the permit applications in this matter. There was another public hearing in the 1980's simply to assess public support for the project. The concern he has is the lack of transparency with the permit process. He was removed from that process in which he normally makes the determination. Here it was removed to a hearing officer within the Secretary's office which he views as a conflict of interest. The agency should operate beyond outside influences. The normal process should control despite the nature of the project. If the water quality in the Canal already does not meet minimum standards, then any additional sources of pollution will make a bad system worse. Absent evidence of increased flushing, the addition of motorized craft on the Canal will not improve the situation.

On re-direct examination, Mr. Moyer testified that the people who testified at the prior public hearings testified as to their belief that the dredging would increase flushing of the dead end lagoons in South Bethany. The subaqueous lands or wetlands statutes do not set limits for assessing environmental, aesthetic, economic or safety issues. It is a judgment call. He is not here to second guess the agency. The length of this process

indicates the difficulty with making these decisions.

On re-cross examination, the witness testified that there is no requirement that the Secretary must perform a cost/benefit analysis in accordance with the ACE standard. No specific ratio must be used.

On examination by the Board, Mr. Moyer testified that once the dredging is completed, maintenance dredging would have to occur every four to five years. That assumes the no wake zones are followed. Those costs were not considered in the determination. He believes they should have been. He did not hear anyone at the public hearings express a particular need to get from the Little Assawoman Bay to the Indian River Bay. To his knowledge, it would be required to determine the useful life of the project. He did not know whether the enforcement criteria for no wake zones have been determined. He is aware that the marine police cannot keep up with the requests for no-wake zone establishment because of the damage it has done to private property. It would take 46 minutes to travel the canal at a no-wake limit. He would like to say he viewed the entire project in a holistic manner. The Hearing Officer and the Secretary made the determination that the benefits outweighed the costs. It is not up to him to second guess those people. He feels Parks and Recreation's input into this project was lacking.

On further examination by the Board, the witness testified that there should have been more study of the importance or non-importance of the Canal as a fisheries habitat within the Canal itself as opposed to just the north and south ends. More study should have been done on sediment quality, slope stability, impacts on boating traffic, and the actual flushing mechanism post-dredging. Alternatively, it should be determined how

the dredging fits into the overall plan of the Division of Parks and Recreation for this site. This includes whether non-powered boats would be more compatible with this waterway. The data is insufficient to determine whether the dredging will cause environmental harm. Comparing it to White Creek is comparing apples to oranges. He does not see how a no-wake zone can work within the canal due to its narrowness.

B. *Agency's Case*

6. The Board considered the testimony of Mr. David L. Hardin. Mr. Hardin testified that he is employed by, and part owner of, Environmental Resources Inc. He has a masters degree in wildlife ecology. He worked for six years with the Wetlands and Subaqueous Lands section ("WSLS") of DNREC. He is now a private consultant. Mr. Hardin was admitted as an expert in the areas of wildlife biology and wildlife ecology.

Mr. Hardin testified that he was contacted in 1989 by DNREC regarding the permit application for the dredging project. He did the assessment reports for DNREC on four occasions. His main contact at DNREC was Mr. Charles Williams at the Division of Soil and Water Conservation. Mr. Williams was specific that if there was any indication of a detrimental effect as a result of the dredging, he was to be notified. He does not believe there would be any long-term detrimental effects.

They did some flushing analysis in 1989 using the tidal prism approach, but it was much too simplistic for the Canal. There is shoaling at the ends of the canal, but the greatest amount is just south of the Loop Canal and near the Route 26 bridge. The Canal has an average depth of 2 feet below mean low water.

The witness testified that he prepared sections 2 through 6 of the assessment report with the exceptions of the fish and benthic organisms portions. He traversed the

Canal at least four or five times. The last time was two years ago. The banks of the Canal are steep and wooded in the north side. On the south side it is still wooded, but there are more tidal marshes behind those woods. There are some places where the canopy covers the waterway. The bottom of the Canal is a sandy bottom for most of its length with the exception of the south side where it is more silted.

The witness testified that during the spring, summer and fall, the diamondback terrapin traverses in brackish waters. Their habitat is sandy soil, which is not around the Canal. They tend to hibernate in muddy, marshy bottoms, and the bottom of the Canal is sandy. They start hibernating in November, and the time limitations for the dredging are September through December. His company wrote a section of the report regarding destruction of land cover for the haul roads and access. A total of 1.29 acres of forest would be destroyed. He has not been to the CDF sites for a long time.

The witness testified that he had one college course in water chemistry, and for one year while he worked at DNREC he reviewed the water quality data and made determinations as to impacts. He was not qualified as an expert in the area of "water quality", but the Board allowed him to testify with respect to water quality and eventually how it affects the wildlife in the Canal. He did write the water quality portion of the report. They used DNREC data as well as two testing sites at the north and south sides of the Canal. They looked at dissolved oxygen, salinity, etc... Organisms can be affected by turbidity with the reduction of oxygen. Sediments will settle out quickly because they are mostly sand. In addition, because of the time of year the dredging will occur, most of the organisms will have moved out of the area, and there would be little impact. In his opinion there would be little effect on organisms based upon the water

quality resulting from the dredging. Summer flounder will not be living in the area as dredging occurs. Bluefish, weakfish, and the diamondback terrapin as well will not be in the area. The south part of the Canal could be dredged before the terrapin move in to the area for hibernation.

The witness further testified that there would be no impact on the terrapin as most of the area would not be used for hibernation, and in the small area where they might, it could be dredged prior to the hibernation period. Terrapins are fast turtles, and could move away from the dredge. They nest in sandy areas and hibernate in marshy areas.

The witness testified that there was some testimony on the sediments and sediments types that would be dredged. They were tested for chemicals and pollutants. The testing was done mostly by DNREC personnel. Most of the material is sand and relatively inert. There should not be any impacts from the dredge spoils. There are mitigation efforts. One is the date restrictions. There will also be containment curtains to keep sediments from coming into adjoining areas and to keep out people and other organisms that might try to gain access to the Canal. In his opinion those restrictions are adequate to protect the wildlife and minimize the impact--especially the time of year restrictions. This is the time when most organisms are the least active. Temperatures are cold and the dissolved oxygen levels are at their highest.

The witness further testified that the Canal is not a significant biologically productive area. There is so much development on either side of the Canal that it devalues the biological productivity of the Canal. It is a small, shallow waterway, and given the sandy bottom, that reduces the number of species that will utilize it.

In the witness' opinion, there will be an overall increased improvement in the habitat of the Canal due to the dredging. The Canal's salinity will not change, and they are "hoping" for increased flushing. Deeper water would hopefully decrease the temperature even with the removal of some trees. Deepening the Canal would improve the habitat quality. With more water moving through the Canal, and with increased oxygenation, more fish would move through the Canal. It will be an overall net improvement even with increased recreation on the Canal. There would not be the depressed areas due to the shoaling that reduces the water movement. The width of the Canal is approximately 60 feet with it being somewhat wider at the north end. The dredging area is 35 feet. The areas outside the dredge area will still have benthic organisms that can migrate into the dredged area. Even the sediments that slump in will have organisms in them and will not be sucked out.

The witness further testified that he worked on the assessment for the dredging of White Creek. He compared the water bodies. One is a naturally occurring water body while the Canal is man made. White Creek has a greater diversity of bottom types as compared to the Canal. Due to its length, White Creek receives fresh water inflow and has different salinity zones. It has much more in the way of fringe marshland with greater nursery areas. There are more hard structures within the creek (docks, etc...). As far as the organisms, there were several fisheries studies done before the dredging and then several years after the dredging. There was little difference in the dominant species.

On cross examination, Mr. Hardin testified that with respect to White Creek, there was one study done in 1970-71 just prior to the dredging, and a graduate student came

back 25 years later and replicated the study. He is aware there was one study done by John Clark regarding fish species in both White Creek and in the Canal. He was not aware the study showed there were fewer species in White Creek. His opinions regarding dissolved oxygen are due to increased movement after the dredging. He testified that his assumption is unproven. He does not believe there will be any degradation. His opinions are based upon the DNREC technician's calculations using the ACE HEC-2 computer program. He has never used the HEC-2 program and does not know the assumptions associated with that modeling. He did not put together the permit application. As to the sections he wrote, he is not aware of any errors in the final document. As to the diamondback terrapin, it is his opinion that most of the Canal is not hibernation habitat for this species. Section 5.3.6 of the assessment report was not prepared by him, and it was prepared after the public comment period. This section indicates that diamondback terrapins hibernate along the Canal. He is not aware of any condition in the permit that limits the dredging in areas that are known to have diamondback terrapins hibernating or limits dredging to times prior to their hibernation period. He has not done any type of study to determine how much turbidity would be cause by the erosion of the shoreline post dredging. He was not aware that the DelDOT bridge construction projects allowed for dirt to be dumped in the Canal to allow trucks to drive across the Canal during the construction. This would have contributed to the shoaling. He had not read Dr. Whereat's or Dr. Ullman's comments resulting from the public comment period in 2002. There were the least amount of changes between this permit application and the most recent one because of few changes in the dredging methodology. No specific studies were done following the 2002 comment period other

than to update water quality studies.

On further cross-examination, the witness testified that the Canal does not meet current water quality standards for dissolved oxygen on occasion. There is not any requirement in the permit to improve dissolved oxygen levels. The Canal also violates current standards of enterococctal bacteria. Sampling was done on the Route 361 bridge, the Route 54 bridge, and in the Little Assawoman Bay. With the increased flushing, all the bacteria will be flushed into the Little Assawoman Bay. No studies were done to determine whether boat heads would be flushed into the Canal. Generally, most boats on the inland bays are not large enough to contain internal heads. The depth of dredging would preclude most of the larger boats that would have heads. One of the compromises was to preclude the larger boats from using the Canal by limiting the dredge depth to 3 feet below mean low water.

The witness testified that he did not prepare the economic analysis portion of the report. When he first started working on this project, it was his understanding that the General Assembly had appropriated monies to dredge the Canal.

On re-direct examination, the witness testified that the General Assembly appropriated funds for the dredging on three separate occasions. Due to public comments and resource agencies (e.g., the ACE, National Fishery Service, etc...), both the depth and the method of the dredging were changed. There have been quite a few modifications based upon input from the public.

On examination by the Board, the witness testified that there should be no hibernation of terrapins in the spoils area. He does not know whether there are any turtle parts observers employed by DNREC. He does not know how one observes turtle

parts in the dredge spoils or what level of parts would trigger some action. There is still some gathering of them as a food source. He has not seen a terrapin in the Canal during the times he was in the Canal. They would be more expansive in tidal marshes where they would feed. He does not have any specific species in mind when speaking of the benefits of increased flushing. The tide cycles at either end of the Canal are out of synch by a number of hours. There is a greater tidal head forming on the north side, and then there is about 15 minutes of slack time before the tidal head coming in from the south. There is a net flow from the north to the south. They estimate a net increase of a doubled flow.

The witness further testified that he has not been to the dredge spoils site in quite a while. Loblolly pine is not a wetlands species. He cannot say whether it is a wetlands area. If the ACE also issued a permit, he would assume they would not allow disposal on wetlands. There are other shallow water habitats similar to the Canal, and therefore it is not one of a kind.

7. Board considered the testimony of Mr. Ronald D. Gatton. Mr. Gatton testified that he is self-employed as an environmental consultant generally in wetlands delineation and obtaining permits for marinas. He has a B.S. in fisheries management. He worked in the aquaculture industry for several years and then he worked for the Smithsonian Institution. Eventually he was employed in the habitat protection branch of the National Marine Fishery Service. He primarily reviewed ACE projects. He made recommendations to reduce impacts on the projects. He helped with water quality and tide studies. He is a fisheries ecologist and accepted as an expert in such.

Mr. Gatton testified that he was involved in the late 1990's with the benthic and

fisheries sections of the assessment report--sections 2.3.3, 2.3.4 and 5.3.3 and 5.3.4--and collaborated in the potential impacts and conclusions of the report. He is aware of conditions and restrictions on the dredging. He recommended that the permit be limited to September 1st through December to minimize the negative aspects of the dredging. The species that might be affected by the dredging were determined by references in the literature. Summer and winter flounder and bluefish were the primary species of concern. As far as benthic organisms, there are no shellfish beds or aquatic vegetation. There are more opportunistic species that have settled in the Canal. He has no evidence the Canal is a significant nursery for any species. It is not unique other than it being man made. The habitat is similar to that found in the region, but it is not as good because it is man made. It is not as diverse as what would occur in open areas such as shallow coves or bays. He has been to parts of the Canal. He was at the north end and the Route 26 bridge. Assuming the time of year restrictions are followed, he opines that there will be no effect on winter flounder. There should be none in the area. The juveniles and adults start moving out of the area in August. There is spawning offshore in October. In November, there may be a small number of juveniles coming in off the coast. There is much less effect from the mechanical dredging as opposed to the hydraulic dredging, but he would expect no more than the effect of capturing the offspring from one adult female (up to 7,000 juveniles). The reduction in these fish species is due to over fishing. Recovery of the benthic community is essentially the recovery of the fish community. Generally, it has been stated in prior studies that it will take up to two years. The opportunistic species come in within days to months. He would expect the recovery to occur within the first summer. There will still be sources

coming from the sides of the Canal. Slumping will be restricted to a foot or two. If there is a net flow through, then colonization will come from White Creek and down the Canal. The major issue is whether one is changing the sediment type. Sand is one type of sediment that is repopulated fairly quickly. Here the project will eliminate pockets and shoals. He would expect the area to be repopulated with the same species as are present in the Canal currently. Any effect on the biological productivity of the Canal would be minimal.

On cross examination, Mr. Gatton testified that he looks at the overall bathometric data to reach the conclusion that there are stagnant areas in the Canal. It is a narrow canal that is over three miles in length with shoaling. There is water over the shoals even at low tide. There can be water passing over stagnant water. This does not mean the entire column is mixing. He has no studies to support this. He relates this to what he has seen in other areas where holes have been dredged in the bay. He has not done any flow studies of this canal, and he is not aware of any studies done relating to the mixing in the Canal. He did a literature search to determine what species that were documented in the Canal. He did not do any studies, but he reviewed John Clark's and Charles Lesser's work. This is all the data pertaining to the fish in the Canal. The recommendations indicate that the sampling is inconclusive as to the effect of the dredging of the Canal. There has been no year-round study of benthic organisms. He used much of the Delaware inland bays work done in the past.

On examination by the Board, the witness testified that the project could take as much as three years. The silkt curtains (sediment curtains) will allow water to come through. They are there to stop sediments and turbidity. They do not need to be there

when dredging is not occurring. He is familiar with multiple year dredging. It would not change his opinions. He has not done field work in the Canal personally. The food resources would be typical for those outside the Canal. This would be based upon John Clark's survey. Benthic organisms reproduce during the winter, and their highest populations are in the winter. They are most productive during the summer, but they are being depopulated due to harvesting. He does not believe boating will have a significant impact on benthic populations. There is a no wake zone required for the entire length of the project.

7. The Board considered the testimony of Mr. John Clark.

Mr. Clark testified that he is employed by the Division of Fish and Wildlife. He has been an environmental scientist in fisheries biology for 15 years. Before his employment with DNREC he held several fisheries jobs covering a period of approximately 5 years. He has a MS in fisheries science. He was accepted as an expert in fisheries science and biology.

The witness testified that he reviewed DNREC Exhibits numbered 4, 5, 6 and 8 (constituting his one-day study of August 7, 2002, the Pacheco and Grant study from the 1950's, the Lesser study, and the more recent study by Dr. Jim Targett). The Targett report will be made public. His opinion is based in part on those reports. He did a one-day sampling of the Canal in 2002. He is familiar with the habitat in the Canal and, to a greater extent, in White Creek. In his opinion, the two bodies have a similar habitat with respect to fisheries. The channel in the Canal is very narrow with a sandy bottom and some silt/mud on top. There is not much difference between the Canal and other tidal tributaries in the inland bays. The habitat is not unique. He was not

surprised to catch more fish in White Creek than the Canal. The bigger tidal tributaries tend to attract more species in larger numbers than the Canal. He views the Canal as essentially a tributary of White Creek. He has not seen any long term effect on the fish species in White Creek which has been dredged before. This applies even going back to the 1950's. The fish communities remained steady over the years. The Canal should be no different. He does not view the Canal as any greater fishery habitat than any other tributary on the inland bays. He would expect the habitat to return following the dredging. With regard to White Creek, the fish communities came back within a year or two. The macrobiotic communities returned within a month. He would expect the same for the Canal.

The witness further testified that he has no control to determine whether the boat traffic affected the fish populations. The conditions in the permit will avoid most of the juvenile fish populations. He believes the impact on the fish populations will be short term. He cannot say definitively that there will not be a long term impact; however, he does not believe there will be such an impact.

On cross examination, Mr. Clark testified that White Creek is wider than the Canal, and it has more natural slopping banks and some small pockets of marsh contiguous to the creek. The Canal has steeper banks and is narrower. By having more natural slopping banks, White Creek has more of the shallow natural fish habitat. The Canal does not have as much of this habitat. There are more overhanging trees in the Canal. He has little experience with that because there is little shade in tidal waters. He cannot say if it has a more positive or negative impact. He assumes it would result in cooler waters. This does not mean the fish would prefer that habitat.

On further cross-examination, the witness testified that his one-day sampling was done to replicate the 1986 sampling done by Lesser. There was no other sampling done other than that done by Targett's graduate students this year. This occurred after the permit was issued to dredge the Canal. His study suggests the Canal is used as a nursery for some species including flounder and weakfish. He has not determined whether the permit includes all of Lesser's recommendations. The one-day study confirmed that the species composition found in the Canal is the same as that in White Creek. He is aware of the Campbell studiy done in the mid-1970's. He is aware Campbell stated that two years of data is necessary to make conclusions about fish populations. Campbell was comparing his work to that of Pacheco and Grant from the 1950's.

On re-direct examination, the witness testified that a one-day sample is not conclusive; however, it does not mean it is invalid. The one-day sampleing was done to see if there was anything anomalous to justify further study. As they did not find anything anomalous, and the composition was similar to that of White Creek (with 10 years of data), a more comprehensive study was not needed.

On examination by the Board, the witness testified that deepening of the Canal would not necessarily result in greater fish species using the Canal. That could be offset by other effects. His opinion is based upon a no-wake zone that is followed. If it is not followed, there is not as much area to dissipate the wake, and that could have a greater effect. In the upper-most reaches of White Creek, it is fairly narrow--only 20 to 30 feet wide. Upper White Creek will have some greater concentrations of juvenile species due to the lower salinity. That difference in salinity is not present in the Canal.

He has caught terrapins occasionally in their nets. He has seen them in White Creek but not in the Canal. White Creek was dredged between September 1997 and 2001. In White Creek, depending upon the time of the year, it can be pretty busy with boat traffic. Water quality might keep some of the fish out of the Canal in a worse case scenario--but most of the fish that frequent the Canal are tough and survive in poor water quality. He has spent more than 100 days on White Creek. He has seen one or two enforcement officers on White Creek during those 100 days.

8. The Board considered the testimony of Mr. Charles E. Williams, II.

Mr. Williams testified that he is an environmental program manager with the agency. He has been a full-time employee since 1984.

Mr. Williams testified that he has been involved in the Canal dredging project since 1984. There was a public meeting in Bethany Beach to gauge public support for the project. In 1986, the first dredging study of the inland bays was completed. At the time they did not have sufficient funds to dredge the Canal. The Canal has always been treated as a yellow project despite its classification as a green project. The new dredging plan, dated October 2002, is the methodology for dredging in the inland bays. (DNREC Exhibit No. 10). The 1986 study is policy--the 2002 document is guidance. According to the document, the Canal is classified as a Class II waterway. There are no federal monies involved in this project. Under the guidance document, the "rigorous" ACE cost/benefit analysis is not required.

The witness testified that in the first assessment report the agency was reviewing a four foot mean water depth. They reduced the depth to three feet to avoid a further widening of the canal. The ACE objected to the mechanical dredging because it would

remove the overhanging canopy of trees. A compromise was reached to use mechanical dredging on the southern portion where there were fewer trees and hydraulic dredging on the northern portion. There is a condition in both the ACE and State permits to discuss the removal of trees and vegetation to conduct the dredging. About 1.3 acres of upland vegetation would be impacted for road construction. The seasonal operation of the dredge was included to address the fisheries concerns. The no wake rule was included to minimize sloughing and other impacts on the banks. The turtle parts observer condition can work even with the small parts. They used a similar observation protocol for Pickering Beach related to horseshoe crabs.

The witness further testified that dump trucks to haul the dredge spoils will be watertight. They will also use turbidity curtains in both directions within 500 feet of the dredging. He has traversed the Canal approximately 100 times. He has not seen one terrapin along side the Canal. The area around Jefferson Creek (with one small section) will not be dredged, and according to Mr. Hardin, this is the area most likely to contain the terrapins.

The witness testified that he did the economic evaluation study in DNREC Exhibit No. 1. He used the unit/day methodology followed by the ACE. He did the original in the summer of 2000, and revised it in November of 2002. The ACE never objected to his analysis.

The witness testified that there are a couple of bad shoals in the Canal as indicated by Mr. Hardin. The two dredge spoils disposal sites are on state lands. The 2002 aerial photographs in DNREC Exhibit No. 11 accurately depict the locations of CDF#1 and CDF#2. CDF #1 is a two acre site consisting of sandy loam and previous

dredge spoils. There are loblolly pines and other shrubs on site. CDF #2 is a previous dredge site utilized in 1982. CDF #1 was evaluated in 1999 at the request of the ACE. He went down to the old Fresh Pond disposal site after the first day of hearing. There is a large amount of disposal spoils already on the site. DelDOT will use the material at the Fresh Pond site for the new inlet bridge. This will open up this site for enough material to cover the north end dredge spoils from the Canal. This may be an alternative for the CDF #1. DelDOT may also be interested in using the spoils that can be directly trucked to the bridge. The General Assembly has appropriated $240,000 for this project to date. There was no intent to replace canoeists and kayakers with motor boats. Everyone envisioned the Canal being used as well by small whalers and pontoon boats.

On cross examination, Mr. Williams testified that no studies would be done regarding whether canoeists or kayakers would be displaced by motorized boat traffic. No attempt was made to determine the opinions of those non-motorized boaters. DNREC dredged the Loop Canal in 1984. No analysis was done regarding flows into the Canal in connection with the Loop Canal dredging project. He has no formal economics training other than one course in college. He had someone teach him to use the methodology from the 1986 study in conjunction with the unit/day analysis. They did no study on the number of boats that would use the Canal after the dredging. They utilized estimates based upon the location of nearby marinas and the number of boats in those marinas. His estimate of the costs is based upon the costs of the dredging, disposal costs; rip rap installation and vegetation removal. He did not include the costs of enforcement of the no-wake speeds, or the continued maintenance dredging or

erosion control costs. The difference between the costs and the benefits was somewhat more than $5,000.00. He would classify the Canal as a narrow creek. In the northern portion of the canal, the banks are sand and gravel and easily erodable. This is not true for the southern portion.

On re-direct examination, the witness testified that the costs of the no-wake rule cannot be estimated without a good idea of the number of boats that will use the Canal. The last time it was dredged was in the late 1950's, and therefore, it took 45 years for it to silt back in.

On examination by the Board, the witness testified that CDF #2 is already 2/3 full. Odor will be minimal and only during the dredging. It is also in an area that has not been developed. Some maintenance dredging was done in the 1980's related only to someone's boat ramp and a marina. Had this been a more restricted class of waterway, then the dredging would likely not have taken place. He did not include in his analysis the secondary costs associated with marine policing due to increased boat traffic. He also did not include the secondary costs associated with shoreline protection due to increased boat traffic. The benefit figure in the analysis is a one-shot deal. It is not an annual figure. By plan, the bridges across the Canal should be eleven feet above mean high water mark.

9. The Board considered the testimony of Mr. James Graybeal

Mr. Graybeal testified that he is the Chief of Enforcement for the Division of Fish and Wildlife of DNREC. He is responsible for the enforcement of boating regulations in the State of Delaware.

The witness testified that motorboats cannot navigate the Canal at this time.

They will if the Canal is dredged. He has put together a cooperative enforcement plan with the Division of Parks and Recreation and the Division of Air and Waste Management. The Canal is owned by Parks and Recreation. Parks and Recreation has committed to put a seasonal officer in the area during the peak season. They intend also to routinely patrol that area. They have a budget for five seasonal officers for the inland bays. They have nine officers. If a private boater sees a no wake violation, and it is called in, then they send someone out to investigate. Violations are prosecuted in the Justices of the Peace Courts or, if bumped, to the Court of Common Pleas. They also do a voluntary assessment on the spot of $45.00. It is essentially a traffic violation. They further intend to look into funding for surveillance equipment and they intend to distribute information to local marinas to inform people about the Canal. The General Assembly has not restricted the use of jet skis or personal watercraft.

On cross examination, Mr. Graybeal testified that the area of the Canal would include Indian River Bay, White Creek, and Jefferson Creek. Prior to the middle of May, the seasonal officer would not be there. Existing resources would have to be used in the fall and early spring. The peak period runs from May through September. October and November may be exceptions. The seasonal officers have no police powers--only Fish and Wildlife officers do--so the seasonal officers have to work with the Fish and Wildlife enforcement officers to issue citations. He does not have an idea of how many citations were issued last year. No wake speeds are the minimum necessary to maintain speed sufficient for steering. The effect on the shoreline is not necessarily considered. It is based upon the effect of 100 feet from a dock. When there is not a 100 feet to measure, it will be a no wake area.

On examination by the Board, the witness testified that if a seasonal officer is utilized it would be a $3,500 appropriation or approximately $40,000 for a full-time officer. The presence of the officer is a deterrent more so than an enforcement tool. Off the top of his head, in the Lewes-Rehoboth Canal, there are very few citations. The witness could not state how many no-wake violation citations were issued for 2003. He could not locate this report or the report for 2002. The proposed enforcement policy was written three or four days ago in preparation for this hearing. They will be making a budget request for an additional, permanent, enforcement officer. They have made some arrests for no wake violations, and some will not be contested with payment of a voluntary assessment. The no-wake speeds are for the protection of property—not the environment.

III. Findings of Fact and Conclusions of Law

In reaching its conclusions in this matter, the Board has reviewed extensive testimony and documentation. It is obvious that both parties and their legal counsel have expended large amounts of time, effort and money with regard to this matter, and it is equally obvious that there are members of the public who share opposing viewpoints with regard to the validity of this project. The Board has considered this matter very seriously and has taken considerable time to reach the result below. This opinion will not discuss each contention because the Board is unanimous in its conclusions regarding the majority of the issues related to the permits before us. On those issues, the appellant did not meet its rather substantial burden of proof. The Board's opinion focuses primarily on the weaknesses in the permitting process for this

project that were not supported by the evidence on the record before the Board.[6]

In its closing argument, the Sierra Club raises several issues related to the Secretary's determination of the environmental impacts to the dredge and disposal sites, impacts on water quality, and the long term effects of the dredging on biologically productive areas. In short, with regard to all these issues, the Sierra Club failed to satisfy its burden of proving that the permit decisions were not supported by the evidence on record before the Board. The Sierra Club, however, has also focused on the issues that are of primary concern to the Board: the enforcement of the no-wake speed limits and the failure of the agency to consider certain secondary costs in its cost/benefit analysis.

Pursuant to the agency's *Regulations*, it "**shall** consider" additional factors in reviewing a dredging application. *Regulation* 3.05(B) (Emphasis added). Regulation 3.05(B)(3) requires the agency to consider "[a]ny economic and noneconomic benefits of the project compared to the costs of the project, **both direct and secondary**." *Regulation* 3.05(B)(3) (Emphasis added). Based upon this reference, the parties agree that the agency is required to conduct some form of a cost/benefit analysis. They disagree on the extent of that analysis. The Board, however, does not need to delve into that discussion because the agency did not follow its own protocols for the cost/benefit analysis it conducted in regard to this project.

The Board reviewed the October 2001 edition of the *Methodology for Evaluation of Proposed Dredging Projects in Delaware's Inland Bays ("Methodology")* (Sierra Club

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[6] Board Member Wood concurs in the majority opinion of the Board. He has chosen to expand upon that opinion to address certain issues in further detail. His concurring opinion is attached as a supplement to the Board's opinion.

Exhibit No. 11)[7] that is referenced in Mr. Williams' economic evaluation section of the agency's assessment report for this project. While Mr. Williams refers to this document in his testimony as "just a guidance document", he states in his economic evaluation section that "[t]he project is also consistent with the Department's revised policy guidance document for undertaking dredging activities in the Bays' region, the [*Methodology*]." (DNREC Exhibit 1, at page 182). It is further evident from the preamble to the *Methodology* that the agency intends to incorporate it in its *Regulations*. (Sierra Club Exhibit No. 11 at page 1-2). The agency, therefore, places more weight on this document than Mr. Williams' testimony would suggest.

Section 6.0 of the *Methodology*—entitled "Permit Evaluation Guidance"—discusses the use of the approaches to the ACE cost/benefit analyses as "guidance" for other state or federally-funded projects. This section contains tables that define direct and secondary economic costs and provides examples of such costs related to a dredging project. (Sierra Club Exhibit No. 11 at page 6-1). In Table 6-4, the *Methodology* lists among the examples of secondary costs: "[i]ncreased costs for marine policing due to increased boat traffic" and the "[c]ost of shoreline protection required due to increased boat traffic." (Sierra Club Exhibit No. 11 at page 6-3). The *Methodology* goes further to indicate that "[i]n order to complete a **simplified** cost benefit analysis, the attributes of these costs and benefits must be considered, including: • duration…." (Sierra Club Exhibit No. 11 at page 6-4)(Emphasis added).

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[7] While Mr. Williams made reference to an October, 2002 edition of this methodology, the agency chose to introduce portions of that document only, and the relevant portions to which the Board will refer were not included in that submission. Accordingly, for purposes of this opinion, the Board must assume that the 2001 edition is relevant to its review of this matter.

The testimony before the Board indicates that the agency did not follow the *Methodology* in assessing the secondary costs and benefits for this project. Dr. Stearns, the only qualified expert to testify regarding the economics of this project, testified that the agency did not follow its own *Methodology*. Dr. Stearns indicated that the agency did no analysis related to the future costs and benefits related to this project's life. Mr. Moyer, whom the Board has found a credible witness for the agency in numerous prior proceedings, testified that the agency never determined the useful life of this project. Mr. Williams admitted that he did not include in his analysis the costs for: 1) enforcement of the no-wake speeds; 2) continued maintenance dredging; or 3) future erosion control.

Furthermore, all of these costs are dependent upon compliance with the no-wake speed limits through the entire length of the Canal. The agency fully expects an increase in motorized boat traffic through the Canal once it is dredged. (See pages 150 through 154 of DNREC Exhibit No. 1). This is reiterated in Mr. Williams' economic analysis section. (See pages 182 and 183 of DNREC Exhibit No. 1). Throughout the assessment report, the "minimal" costs that the agency associates with maintenance dredging and erosion control are contingent upon either the "anticipation" that the boating public will adhere to the no-wake speed limits, or the expectation that the no-wake speed limits will be "strictly enforced". (See e.g., pages 156, 176 and 189 of DNREC Exhibit No. 1).

In addition, much of the testimony related to certain environmental impacts was also dependent upon compliance with the no-wake speed limits. Mr. Gatton testified that his "understanding" of the effects of the project on fish and benthic organism

populations was dependent upon the no-wake requirement. Mr. Clark testified that his opinion was based upon the enforcement of the no-wake speed limits. He further testified that the benefits of deepening the Canal would be offset by other effects—including boaters not following the no-wake speeds. Mr. Williams also testified that the no-wake posting requirement in the permit was intended to minimize sloughing and other impacts on the banks. Consequently, the agency acknowledges that the no-wake speed limits are central to the future success of this project.

The Board finds that the likelihood of the public fully complying with the no-wake speed limits in the Canal is small. Mr. Clark agreed that "it is not a good supposition" that the no-wake speeds will be obeyed.

The Board further finds that the likelihood the agency will be able to strictly enforce the no-wake speed limits is similarly small. Mr. Clark testified that in the more than 100 days he has spent on White Creek, he has observed an enforcement officer on perhaps one or two occasions. He agreed that White Creek can be a "busy" waterway with boat traffic. Mr. Moyer, a retired, long-term employee of the agency, testified that he as well has concerns with the enforcement of the no-wake speed limits. Mr. Graybeal's testimony convinced the Board that the likelihood of enforcement was small. His reluctance to provide the Board with information that he either knew or should have known regarding enforcement of no-wake speed limits was telling.[8] In addition, the fact that the agency, through Mr. Graybeal, had no proposed policy regarding the enforcement of the no-wake speed limits in the Canal until just three or four days prior to the last hearing date indicates to the Board that the agency did not

[8] The Board did not find the testimony of Mr. Graybeal to be very credible.

consider this to be a priority for the project. Even the proposed enforcement is dependent upon potential funding from the General Assembly. There is no current budget for such enforcement. What is available at present constitutes only one, borrowed, seasonal officer with no enforcement authority.

The Board finds that there is no credible evidence to support the agency's assumption that the public will comply with the no-wake speed limits or that the agency will strictly enforce the no-wake speed limits in the Canal. Given the above findings, the Board concludes that the condition in the subaqueous lands permit for the posting of no-wake speed zone signage does not constitute sufficient mitigation of potential negative impacts. The Board further concludes that the agency's assertion that the associated costs related to such negative impacts will be "minimal" is also not valid.

Given the failure of the agency to conduct a cost/benefit analysis in accordance with its own *Methodology*, and the failure of the agency to consider reasonable conditions for the mitigation of potential adverse impacts resulting from increased boat traffic through the Canal, the Board concludes that the subaqueous lands permit was not properly issued and must be stayed pending further review and modification by the Secretary.

IV. Statement of Determination

The Board *remands* this matter to the Secretary of the Department of Natural Resources and Environmental Control *with instructions* to conduct a new cost/benefit analysis in accordance with the agency's *Regulations* and *Methodology* to be carried out in a manner not inconsistent with the above opinion. This would include

consideration of the secondary costs associated with sufficient policing of the Canal post-dredging that may result in a no-wake speed limit permit condition constituting reasonable mitigation for the adverse effects of the increased boating use of the Canal. Concurrently, the Secretary may consider reasonable, alternative mitigation conditions to offset the adverse effects of the increased boating use of the Canal.[9]

SO ORDERED this 26th day of July, 2005.

ENVIRONMENTAL APPEALS BOARD

The following Board Members concur in this decision:

Date: July 26, 2005

Nancy Shevock
Chairman

[9] Based upon the testimony of Mr. Graybeal, some of the watercraft that may use the Canal, post-dredging, must create a wake to maintain control and steering ability. The Secretary may wish to examine this possibility further and suggest a ban on such watercraft in the Canal.

Environmental Appeals Board
Appeal No. 2004-03

Date: 7/26/05

Stanley Tocker, Ph.D.
Board Member

Environmental Appeals Board
Appeal No. 2004-03

Date: 26 July 2005

Peter McLaughlin
Board Member

Environmental Appeals Board
Appeal No. 2004-03

Date: 7/26/05

Harold Gray
Board Member

ATTACHMENT "A"

CONCURRING AND SUPPLEMENTAL OPINION OF GORDON E. WOOD SR.

The fact that a cost-benefit analysis is required in regulation and guidance as a part of the decision process on permits means that it carries considerable weight. I agree with the department that a strict U.S. Army Corps of Engineers (COE) cost-benefit analysis is not required. I can not agree, however, that the analysis presented in support of the permit met any reasonable reduced requirement. I conclude that even though something less than a COE analysis is required, the analysis must be in sufficient depth to demonstrate a reasonable relationship between the costs and the benefits (not necessarily a positive benefit), and that reasonable and inclusive estimates must be provided to those responsible for making decisions on projects such as major dredging. Why else would an analysis be required in regulation and guidance? If reasonable estimates are used to develop costs and benefits rather than rigid analysis, it is not reasonable to base any decision on a very small positive increment of benefits over costs. One must conclude that in this case, the analysis failed this test and the permit must be remanded to the secretary for this reason. There are other reasons to remand as discussed herein.

I conclude that the costs side of the ledger must include estimates of those of initial construction as well as subsequent maintenance and enforcement costs. There must also be recognition of the estimated economic costs of any environmental damage and the costs of any possible lost recreational and environmental uses of the canal after dredging. These costs must be developed for the life of the project. I do not address the details of each of these components, but they must be quantified in some fashion and included in the cost side of the ledger if any analysis is to be meaningful.

I do not understand how even a most rudimentary cost-benefit analysis could proceed without both some understanding of and a reasonable estimate of the useful life of the project. It was pointed out in the testimony that it took many years for the canal to reach the current state. This is true, but dredging has been contemplated and advocated for many years because the condition of the canal and concomitant reduced usage has existed for many years ---- the useful life of the previous dredging was much less than the over 40 years since the last dredging.

I do not understand how any estimate of the useful life of the canal dredge project can be made without full consideration of a reasonable estimate of the number of vessels which will transit the canal during the project's useful life. The testimony is replete with instances of discussion of erosion from vessels and especially vessels traversing the canal at speeds above "no-wake" speeds.

Further, on this point, there must be some estimate of future-year use of the canal for use as a basis for quantifying the benefits of use of the canal by motorized vessels. Finally, an estimate is required as a basis for estimating enforcement costs over the life of the project. The value of all of these costs and benefits over the life of the project can be normalized to their current value via a simple discount-rate calculation with a reasonable annual discount rate. I conclude that the analysis is deficient on all these points and was not in the detail necessary to support any decision by the secretary- pro or con.

I conclude my discussion of the cost-benefit analysis by stating again, for emphasis, that i agree that something less than a COE type analysis is required, that it can be based upon reasonable estimates of the cost and benefit components, that costs and benefits must be quantified over the useful life of the project, and that only a reasonable relationship of cost to benefits (not necessarily a positive benefit/cost ratio) is required to support a recommendation to issue a permit by the secretary or his designee. Absent such a reasonable relationship in his view, a decision falls into the purview of the legislature.

The question of enforcement must be addressed in detail. As Mr. Graybeal testified, his materials on enforcement were prepared a few days before his testimony. That being the case, it is not possible that the issue could have been considered by the secretary in any depth whatsoever. Further, the fact that the department head was unfamiliar with the record of enforcement of no-wake zones in the inland bays is cause for an understanding that enforcement of no-wake zones is not a serious priority for anyone in the department. This lack of emphasis and understanding would make it impossible to provide a reasonable estimate of such costs for the secretary. If for nothing else, this would be sufficient to remand to the secretary.

Finally, on this issue, I take great issue with Mr. Graybeal's testimony that a no-wake speed is that speed which is required to maintain steerage. If that were the case, speeds significantly less than walking speed would be no-wake speed for many if not all vessels that would transit the canal. This analysis would lead one to conclude that an un-seaworthy vessel could travel at unreasonable speeds with huge wakes, something that would be unreasonable to any other user and a safety hazard. No, in the case of the canal, no-wake zones as advocated by the department for the dredged canal are for safety and erosion control and protection of property. Mr. Graybeal acknowledged in response to a question by Mr. Gray that the designation of safety and management of environmental impacts based no-wake zones are clearly within the authority of the secretary. I conclude that both are more important than the right of any vessel to transit the canal.

Mr. Graybeal's inability to find and provide copies of the draft report on

enforcement for the most recent year and the final report for the year before put the board at disadvantage. It had all the appearances of an unwillingness to provide requested data to the board. It may not have been, but, if so, it was an insult to the statutory role of the board as well to the governor-appointed board itself.

I agree with my colleagues and emphasize that the sierra club failed to demonstrate that the dredging project would cause unacceptable environmental damage. Their burden in this issue was not met.

My supplemental views do not in any way reflect on the decision by my colleagues on the board in which I concur. I believe the issues I discuss herein required more discussion and possible guidance to the secretary. This project has been in process for too long, and added comments may assist in the development of a cost-benefit analysis necessary for an informed decision by the secretary and a fully analyzed enforcement and enforcement funding process.

Respectfully submitted,

Gordon E. Wood, Sr.

Date: July 16, 2005

Upon final consideration and review, the following Board members also adopt Mr. Wood's concurring opinion:

Nancy Shevock
Chair

Stanley Tocker, Ph.D.

Peter McLaughlin

Harold Gray

Environmental Appeals Board
Appeal No. 2004-03

The following Board Members concur in this decision for the reasons stated above and for the additional reasons stated in the concurring opinion attached hereto as "Attachment A":

Gordon Wood
Board Member

Date: July 26, 2005