

previously focused on artificial reef creation to mimic the type habitat lost. The overall, long-term effectiveness of this type of mitigation is cited as a given.

While plausible, we continue to believe that the utility of using artificial reefs as well as the replacement ratios therefor as mitigation needs to be further examined. As was noted in previous Corps of Engineers' documents, investigators routinely observe concentrations of fish around artificial reefs. However, it was also observed that commercial/recreational fishermen frequent these sites. Hence, the value of artificial reefs as attractors for adult fish appears to be demonstrated; moreover, their value in the overall life cycle of these same species is apparent but not precisely determined. If the overall worth of mimic reefs were more precisely ascertained, it could lessen concern about unintended consequences, viz., these devices serve to make selected fish populations more vulnerable by increasing catch per unit of effort.

Until this issue is examined through direct investigation, the replacement ratios for these features should receive more thought. As the matter currently stands, we are concerned that construction of these structures may only provide short-term benefits to fishing interests, but unknown (at least unquantified) positive impacts to the overall ecology of the reef species, especially those being targeted by fishing interests.

Long- and short-term timed averages of exposed hard bottoms are usually used in the mitigation calculations. The premise that after construction not all of the impacted habitat will be continuously covered by sand appears well founded; however, from a functional standpoint, the intermittent nature of its availability may well produce the same result as unbroken inundation.

There seems to be the hypothesis that nearshore populations can intermittently be denied important habitat elements without adverse effect. The significant, but unknown, element of the equation is the length of time involved until critically is reached. Population dynamics can be very difficult to project; however, often times biotic systems deal with the absence of critical elements through the death of a subset of the affected population. Hence, we suggest the notion of using a timed average subset of the affected habitat may have flaws which are significant enough to require a general rethinking of this approach to mitigation planning.

#### Alternative Mitigation Measures

We continue to suggest that a portion of the total environmental loss component attendant to future site specific projects be addressed by adding out-of-kind mitigation. For example, non-point run off from adjacent developed/hard surface areas could be redirected to some form of treatment within the

project reach. A retention/detention type facility with oil/grease separator would lessen the adverse impacts of the current situation in which untreated runoff directly accesses the nearshore habitat. In our opinion, lessening the adverse consequences of this runoff on this sensitive/important environment could be as beneficial as just providing some additional increment of artificial hardbottom habitat in the adjacent nearshore ocean zone. Moreover, water quality improvement would benefit recreational interests. This and other out-of-kind measures could be used for similar nourishment projects which are planned/authorized in the other Regional efforts. Any measures which can lessen the impacts of increasingly pervasive shoreline development need to be examined.

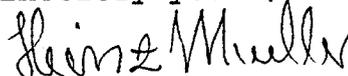
#### Potential Stabilization Problems

Corps of Engineers' publications often note that the use of groins/training structures to stabilize components of eroding shorelines produce mixed results. Site specific documents should detail the Jacksonville District's experiences and successes with these and other hard structures to control beach erosion. Unfortunately, previous efforts at shoreline stabilization have demonstrated that seemingly well-crafted solutions often translate/exacerbate the erosion problem on adjacent beaches, thereby requiring additional and evermore complex solutions.

EPA has assigned a rating of EC-2 to the proposal. That is, we have some environmental concerns regarding the long-term and/or unanticipated consequences of these actions, per se, and just as importantly how they will all affect one another. The additional information derived from the subsequent mitigation and monitoring plans should be instrumental in resolving these issues. Hopefully, it will also provide some insights into the larger issue of the overall environmental consequences of shoreline protection.

If we can be of further assistance in this matter, Dr. Gerald J. Miller (404-562-9626) will serve as initial point of contact in regard to NEPA matters, whereas Mr. Jose Negron (404-562-9422) should be contacted on Section 404 issues.

Sincerely yours,



Heinz J. Mueller, Chief  
Office of Environmental Assessment



**RESPONSE TO COMMENTS FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY, LETTER DATED OCTOBER 8, 1996.**

1. Purpose and Need Considerations. "As we have repeatedly indicated to the District, EPA is equivocal regarding the issue of pumping sand onto an eroding shoreface."

Response: Since 1982, your office has opposed Federal participation in beach nourishment, except when it occurs as a part of operation and maintenance of a navigation project. EPA's long-standing position is based in large part on "Saving the American Beach: A Position Paper by Concerned Coastal Geologists", March 1981. EPA has in fact quoted this publication in responding to NEPA documents prepared by the District in 1982 (Dade County), 1984 (Key Biscayne), 1990 (Manatee County) and 1991 (Sarasota County). EPA's general objections, which echo those of this paper, are as follows:

- (1) Doubt as to whether the long term commitments inherent in shore protection projects are in the overall public interest;
- (2) These projects only produce short-term results at ever increasing costs;
- (3) Beach nourishment may foster greater future property losses which would result from inducing additional development;
- (4) Beach nourishment generally produces only localized benefits;
- (5) Non-structural measures are almost always discounted as not meeting planning objectives;
- (6) Pumping sand onto an unstable shoreface only postpones the inevitable shoreline retreat;
- (7) Environmental consequences are only considered on a project by project basis. Cumulative environmental impacts of all beach nourishment within the Jacksonville District have not been addressed.

While the national debate about Federal involvement in shore protection continues, many of the programmatic issues raised by EPA concerning beach nourishment have been answered in two recently completed studies on beach restoration and nourishment, one by the Corps and one by the National Research Council.

The U.S. Army Corps of Engineers recently completed a study performed in response to a March 1993 request by the Office of Management and Budget for the Army to analyze the effectiveness of the Federally sponsored shore protection program. The study's purpose was to compare and contrast the estimates of project benefits, costs and environmental effects with current and projected conditions. The study included a comparison of the anticipated and actual

level of protection as well as an analysis of any induced development effects. A summary of the Corps study findings are:

- (1) The Corps of Engineers shoreline protection program covers a small portion (8%) of the nation's 2,700 miles of coastline.
- (2) Federal spending on the shore protection program is less than one percent of the Corps' Civil Works budget annually.
- (3) Corps shore protection projects do not induce development in the areas they protect. It appears that Corps activity has little effect on the relocation and/or construction decisions of developers, homeowners, or housing investors.
- (4) Beach restoration and nourishment has been accomplished without significant adverse environmental effects, and quite often enhances the beach environment.
- (5) There is limited public awareness of the Federal shore protection program, the locations of Federal projects, and the fact that risks are reduced through project construction.

The National Research Council recently completed a study on beach restoration and nourishment. The NRC concludes that beach nourishment is a viable engineering alternative for shore protection. Its application is suitable for some, but not all, locations where erosion is occurring. Several recommendations were made to improve the cost-benefit analysis procedures of the Corps. The NRC also recommended better public involvement and increased monitoring efforts. References to the reports of the Corps and the Marine Board are enclosed.

The 1996 Water Resources Development Act was signed into law by the President on October 12, 1996. Section 227 reaffirms that it is the policy of the Federal Government to "promote shore protection projects and related research that encourage the protection, restoration and enhancement of sandy beaches, including beach restoration and periodic beach nourishment." Preference was given to areas in which there has been a Federal investment of funds and areas with respect to which the need for prevention or mitigation of damage to shores and beaches is attributable to Federal navigation projects.

#### References:

U.S. Army Corps of Engineers, Shoreline Protection and Beach Erosion Control Study, Final Report: An Analysis of the U.S. Army Corps of Engineers Shore Protection Program, Water Resources Support Center, Institute for Water Resources, IWR Report 96-PS-1, June 1996.

U.S. Army Corps of Engineers, Shoreline Protection and Beach Erosion Control Study: Economic Effects of Induced Development in Corps-Protected Beachfront Communities, Water Resources Support Center, Institute for Water Resources, IWR Report 95-PS-1, February 1995.

National Research Council, Beach Nourishment and Protection, Committee on Beach Nourishment and Protection, Marine Board, Commission on Engineering and Technical Systems, National Academy Press, Washington, D.C., 1995.

2. Necessary Ongoing Investigations, (paragraph 1). “However, we recommend that further coordination continue between involved Corps technical staff sections to: more fully consider the impacts to the important biological resources present...”

Response: At this time only three project segments are being recommended for Federal participation. The recommended project segments are the Lake Worth Inlet sand transfer plant (STP), the South Lake Worth Inlet STP and beach nourishment Dania. The remaining project segments discussed in sections 2.4 through 2.4.3.5 of the DEIS are not recommended for authorization at this time. To ensure that impacts are minimized, additional environmental studies would be conducted and supplemental NEPA documentation would be prepared during planning, engineering and design (PED) phase for each of the recommended project segments authorized. The same would apply to any of the other project segments if they are considered in the future, including the development of new borrow areas and the use of Bahamian sand as a potential source of beach fill.

3. Necessary Ongoing Investigations, (paragraph 2). “It has been our experience that appropriately designed parking together with passage to the beach for non-shorefront residents has proven elusive.”

Response: The certificate of public accessibility, signed by the District Engineer, is located on the last page of the main text. Where lack of either parking or access results in part of the project being inaccessible for public use, the Federal participation for that reach of inaccessible project shoreline is zero. The result is the overall lowering of Federal participation from the maximum allowable by law of 65 percent for eligible project costs.

4. Proposed Mitigation (paragraph 2). “...additional site specific monitoring and analysis should be conducted. These studies would isolate and define the level of mitigation necessary to compensate for the adverse consequences...”

Response: Acknowledged. As previously mentioned, only three project segments are recommended at this time. We do not anticipate any significant adverse impacts to hardground resources from the proposed construction and operation of the two STPs and the nourishment of the beach at Dania. However, as mentioned before, additional analysis would be performed specific to each project segment during PED. This analysis would be the basis for determining the appropriate level and type of mitigation if needed.

5. Proposed Mitigation (paragraph 4). “If the overall worth of mimic reefs were more precisely ascertained, it could lessen concern about unintended consequences, viz., these devices serve to make selected fish populations more vulnerable by increasing catch per unit effort. (Paragraph 5) “Until this issue is examined through direct investigation...” “As the matter currently stands, we are concerned that construction of these structures may only provide short-term benefits to fishing interests, but unknown (at least unquantified) positive impacts to the overall ecology of the reef species, especially those being targeted by fishing interests.”

Response: There might be reason for some concern about concentrating fish, if artificial reefs used for mitigation were constructed in large sandy areas devoid of any type of hardbottom structure. However, artificial reefs used for mitigation are constructed to replace lost or otherwise impacted natural hardbottom and in most cases are located near the area impacted and adjacent to existing natural hardbottom. Since the artificial reefs replace lost natural hardbottom, one should not expect that they would attract fish in any higher concentrations than the natural hardbottom replaced.

6. Alternative Mitigation Measures (paragraph 1). “ We continue to suggest that a portion of the total environmental loss component attendant to future site specific projects be addressed by adding out-of-kind mitigation. For example, non-point source run off from adjacent developed/ hard surface areas could be redirected to some treatment within the project reach.”

Response: The top priority for any mitigation effort is to replace “like for like” or to implement “in kind” mitigation. This is especially true for nearshore hardbottom habitat. Although EPA’s suggestion of addressing water quality of non-point sources in the project area is desirable, we do not consider this “out of kind” mitigation appropriate for mitigating impacts to hardbottom habitat.

FAX 1-904-232-1213

Att. Mr. George Strain  
P.O. Box 4970  
Jacksonville, FL 32232-0019

Re: Coast of Florida Study

FAX SENT OCT 7  
TOO,  
OK,

Oct. 7, 1996  
232 La Puerta Way  
Palm Beach, FL 33480  
407-844-5456

Dear Mr. Strain,

I only found out this afternoon that today is the last day that I can object to the USACOE's prospective project of spending some \$3.9 million on building a plant to both transfer sand from the north side of the Lake Worth Inlet to the south side and also dredge the inlet.

I object to this project for the following reasons:

1. No details of how this plant would work have been furnished. Dredging the inlet from a fixed plant is a new and untried technology.
2. No yearly operating costs of the proposed plant have been furnished.
3. Who would have to foot the bill for the plant's operating expenses has not been stated.
4. No statement has been made about the Town of Palm Beach's proposal to build an extension to the pipe from the inlet to transport sand from the transfer plant further south, to which I also object.
5. No statement has been made about how long it will take to build the plant, when it could be expected to start operating.
6. No statement has been made about whether the present plant would have to be shut down while the USACOE's plant is being built.
7. No statement has been made about whether the COE plant would transfer sand any more efficiently than the Town's rebuilt plant.
8. No statement has been made about whether the COE plant would cost more to run than the Town's plant.
9. Usually any federal government project costs everybody much more than a non-government project. No cost estimates for any part of this project have been made publicly available.

Sincerely yours,



Jim Koontz

**RESPONSE TO LETTER FROM MR. JIM KOONTZ DATED OCTOBER 7, 1996.**

The details concerning the construction, operation and maintenance of the recommended sand transfer system will be developed during preconstruction, engineering and design. Due to the complex nature of the facility, these studies could take up to four years (response to 1, 2, 5, 6, 7, and 8). Final cost sharing for the project is under Department of Army review. The Federal Government will participate in the construction of the plant. Operation and maintenance is a non-Federal responsibility. We are not aware of the Town's proposal to extend the outfall pipe to the south. The Corps will require extension of the discharge line approximately 1,800 feet to the south as a prerequisite to Federal participation. Discharge points would be located 750, 1,250 and 1,750 feet south of the south jetty. The cost estimate and design details for the project are located in Appendix D of the feasibility report.

*Sanford F. Kuvin, M.D.  
149 East Inlet Drive  
Palm Beach, Florida 33480*

Telephone: 561-842-3838  
Fax: 561-842-6743

Mr. George Strain, P.E.  
Acting Chief  
Jacksonville Engineering District  
US Army Corps of Engineers  
P.O. Box 4970  
Jacksonville, Fl. 32232-0019

Re: Public Coordination of the Draft Report  
Comment on the Coast of Florida Study  
Region 3  
Feasibility Study  
Palm Beach Harbour, Lake Worth Inlet

**October 7, 1996**

Dear Mr. Strain:

I have reviewed the Draft Report of the Coast of Florida Study as it relates to Region 3 of Palm Beach Harbour and the Lake Worth Inlet.

Please be advised that I object to two proposals in the report which I feel are detrimental to the shoreline of the Town of Palm Beach, and the long term interests of the Army Corps maintenance responsibilities of the navigational channel called the Lake Worth Inlet. In addition to not being cost effective, these proposals, in my opinion, are wasteful of federal and local moneys.

The Report recommends **the building of a new Sand Transfer Plant** at the Lake Worth Inlet with "advanced technologies". The **old** STP was operational from 1958 until 1990, pumping approximately 70,000 to 100,000 cubic yards of sand each year to the north end feeder beach located at the south jetty spoil area whose sand flows uniformly south with the littoral flow. This form of sand transfer, complimented by periodic ACOE's dredging of the Lake Worth Inlet with deposition of the dredged sand on the north end spoil area south of the south jetty has kept our beaches in a steady stable state for almost 40 years. The Town of Palm Beach sued the county in 1990 as to who would be responsible for STP maintenance, and during the 6 year period while the case was litigated there was no STP operation, 200 feet of north end feeder beach was lost, and without the north end feeder beach nourishment from the STP, the midtown section of the town lost so much sand that a \$6,000,000 Midtown Beach Restoration Project was expedited by the town, declaring it an emergency operation. After the 6 year hiatus in STP operation, the town finally agreed, under public pressure, to rehabilitate and significantly upgrade the STP at a cost of \$1,000,000. This has now very recently been completed with larger diameter pipes, an increase in 200 horsepower to the power plant and a visible significant increase in outflow of sand. The advantages of jet pump technology as mentioned in the Report, and other forms of "advanced technology", are constantly being debated amongst coastal engineers as to their applicability and advantage, but to change a known technology that works in our region (the upgraded STP) at significant local expense to a questionable technology with unknown outcomes with federal and even more local expense is unwarranted. In fact, the ACOE's Coast of Florida Study was drafted during a period

when it was not known to the ACOE when, if ever, the STP would become operational again. In my opinion, because the town has just invested \$1,000,000 in a virtually new (except for the concrete housing shell) upgraded STP, pumping more sand than ever in its history, the destruction of the old STP and rebuilding of a new STP would be unscrupulous and a gross waste of local and federal moneys.

Part of the Report calls for a 3000 foot pipe extension from the STP extending south on to the shores of Palm Beach from the south jetty with multiple outlet valves. This pipe extension proposal is predicated on the "theory" that there is a northerly flow of sand from 'nodal points' south of the south Lake Worth jetty, coursing around the south jetty and entering into the inlet causing shoaling in the navigational channel. In fact, a *bona fide* study has never been made since 1957 utilizing the necessary engineering components which together would contribute to a new informed recommendation. These component parts include the combination of sand marking, wave refraction, pre and post construction maintenance dredging surveys 3, 6, and 12 months after dredging to follow the course of the sand, and periodic surveys of exactly where the sand emanating from the STP goes. None of this has ever been done. Every coastal engineer and coastal geologist will reaffirm that the littoral flow of sand along our coast is uniformly south, with only minor exceptions. A 'nodal point' of northerly sand flow argued in favor of the pipe line extension from the STP by Applied Technology Management (ATM), the firm hired by the Town of Palm Beach, states (page 27, line 3) "Weak (underlined for emphasis) nodal points exist 1000 feet and 4000 feet from the south jetty." Surely this singular inexact study based on a one time wave refraction study and a one time non factual aerial visual observation, revealing a weak nodal point, is not cause for a multimillion dollar revision to a STP system partly federally funded that has proven to work at keeping the north end feeder beach in a steady stable state for over 40 years. ATM estimates that 27,000 cubic yards of sand flow north around the south jetty into the inlet yearly. They base this observation on a computerized 20 year study of wave data obtained from the ACOE files. If the northerly flow of sand theory had any merit - the 6 year period of no STP operation between 1990 and 1996 would have produced at least some accretion of sand at the south side of the south jetty, when in fact a 200 foot loss of beach occurred. Again, this pipeline extension "advanced technology" is not only new in concept, but has never been tried or engineered, with no cost estimates, no projected outcomes of sand dispersal, and with the strong probability of a legal can of worms.

Expensive experimentation with untested methods with a new STP and a pipeline extension with multiple outlets such as those proposed by the Coast of Florida Study, may well produce irrevocable harm to the beaches of Palm Beach, the properties adjacent to them, and to the navigational channel of the Lake Worth Inlet.

I urge the Army Corps to delete these two proposals from from consideration as they relate to the Coast of Florida Study, Palm Beach Harbour - Lake Worth Inlet project .

Sincerely,



Sanford F. Kuvin, M.D.

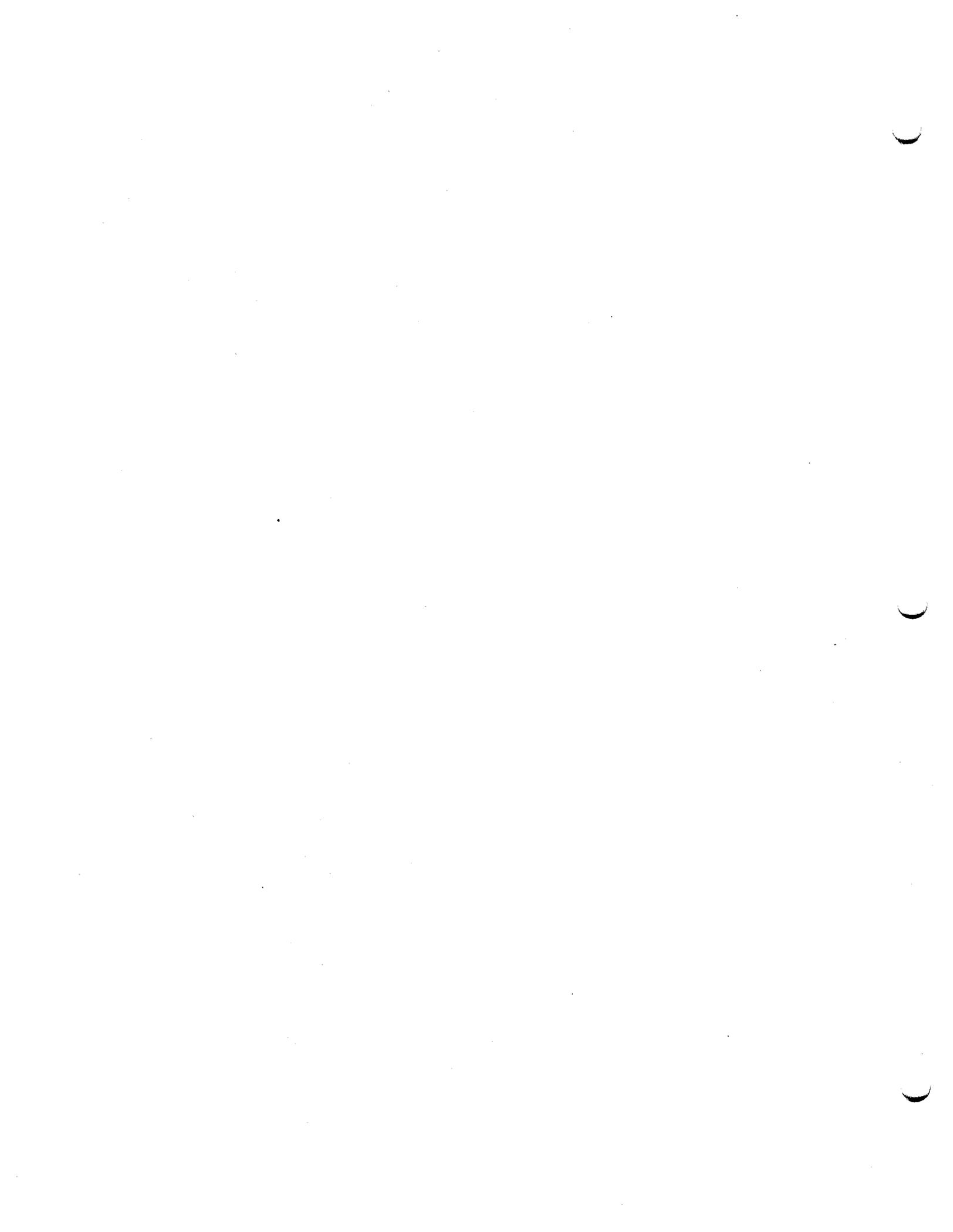
cc: Mayor and Town Council  
Mr. Robert Doney, Town Manager  
Mr. Richard Bonner, ACOE, Jacksonville, Fl.  
Mr. Gary Hardesty, ACOE, Washington, D.C.  
Mr. G. Edward Dickey, Chief Planning, ACOE, Washington, D.C.  
General C. Ballard, Chief, ACOE, Washington, D.C.

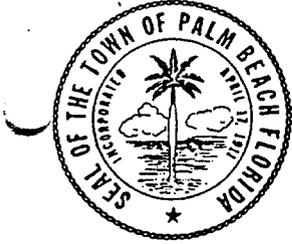
**RESPONSE TO SANFORD F. KUVIN LETTER DATED OCTOBER 7, 1996**

Mr. Kuvin objects to the construction of a new sand transfer plant and extension of the outfall pipe. His statements concerning the stability of Palm Beach Island are not supported. Approximately 8.3 miles of Palm Beach Island are suffering with significant erosion. Palm Beach Island lost 788,500 cubic yards of sand between 1974 and 1990. A small area just south of Lake Worth Inlet, where Mr. Kuvin lives, has been relatively stable due to the placement of sand from the existing sand transfer plant and from maintenance dredged material. Only a small fillet occurs against the south jetty due to its porous nature. Both the extent and nature of the nodal zone has been verified by numerical modeling. We concur that additional field work would add in the design of a new sand transfer system.

The design of a new sand transfer system will require careful planning. However, jet-pump technology is not new. The fluidizing of sand and its placement through a pipe with several outlets is commonly used in almost every beach nourishment contract. The Corps will require extension of the discharge line approximately 1,800 feet to the south as a prerequisite to Federal participation. Discharge points would be located 750, 1,250 and 1,750 feet south of the south jetty. The need for the extension is discussed in the main text of the report, and is supported by engineering analysis in Appendix D. Numerical modeling (GENESIS) indicates that a stable shoreline can be maintained while avoiding the nearshore reefs to the south of the project area.

The cost of the new system will be lowered substantially by the work already done by the Town of Palm Beach to upgrade the existing plant. In particular, the new discharge lines under the inlet will save an estimated \$800,000.





# TOWN OF PALM BEACH

Public Works Department

**FAXED**  
10/4/96

October 4, 1996

VIA FAX & FIRST CLASS MAIL

Mr. A.J. Salem, Chief - Planning Section  
Army Corps of Engineers - Jacksonville District  
P.O. Box 4970  
Jacksonville, FL 32232-0019

Dear Mr. Salem:

We are writing in regard to the Corps' Draft Coast of Florida Study for Palm Beach, Broward and Dade Counties. Because of the massive size of the primary document and its appendixes, we offer a cursory review of the document concentrating on the broader issues and concerns as follows:

1. Sand Transfer Plant - We believe the analyses and benefits of the operation of the plant are badly understated. After the plant ceased operation, it took some time for the sand to stack-up on the north side of the north jetty. However, once the sand stacked on the north side, it began pouring into the inlet, particularly when driven by northeast storm events. The figures contained in Table D-15 on Page D-91 of Appendix D are believed to be inaccurate, particularly years 1994 through 1996 and badly skews the analysis. Attached is a copy of a summary of dredge volumes taken from the Town's Inlet Management Plan prepared by Applied Technology and Management. The information supplied to us by Corps' personnel regarding recent dredging activity includes 178,000 c.y. in 1994, 212,000 c.y. in 1995 and 174,000 c.y. in 1996. The latter figure does not include an estimated 50,000 c.y. that was left in the inlet because the Corps did not have sufficient funds to dredge it all. The 212,000 c.y. figure for 1995 includes turning basin dredging so the amount from the channel is unknown. Many of the figures for previous years in the 1970's and 1980's also do not agree. We respectfully request that all these figures be reverified.

If our figures for the last three dredging years are accurate, and we believe they are reasonably so, the annual dredging in the very recent past supports a substantially different conclusion than that indicated by the Corps' analysis. The dredging of 178,000 c.y., 212,000 c.y. and 174,000 c.y. (50,000 c.y. left in channel) while the plant was out of operation and after the sand piled up on the north jetty, would indicate that the operation of the plant had a major impact on the amount of sand deposited in the inlet. We ask that you re-examine this analysis. It is also noted that the sand in the inlet had a major economic impact on the Port of Palm Beach because of reduced channel depth and it seemed that every winter, the ability to ship full loads was greatly impacted. In fact, in 1993, the Corps performed "emergency" dredging to remove 40,000 c.y. and place it offshore because shipping was so badly affected.

Mr. A.J. Salem  
October 4, 1996  
Page Two

The Town renovated the old sand transfer plant placing two new 12" pipes under the inlet. We would expect to receive credit for these pipes as part of the overall plant improvement since we are very sure they will be usable.

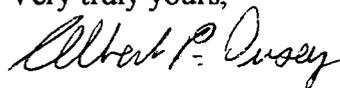
The Corps has consistently planned on the use of jet pumps in the new plant. We have major reservations regarding the effectiveness of this style of pump in that we have heard of significant operational problems in recent applications. If the Corps is going to commit to maintenance and operation costs, your insistence on this type of pump is most reasonable. However, if a local sponsor will operate the plant, we ask that you allow the final design process to determine the most cost effective way to pump this sand.

2. North End Palm Beach Island - The cost estimate of \$9,387,600 for 339,400 cubic yards (including advanced nourishment) would appear high although mitigation of 18 acres of hard bottom is included. Please verify the overall estimate.
3. Palm Beach Island - The description and analysis does not recognize that the Town placed 800,000 c.y. of sand between R-95 and R-100 as well as eleven groins at a total cost of about \$6,000,000 in the winter of 1995/1996. This omission is prevalent throughout the report. The NED project summary for this project also indicates that the renourishment volume of 372,000 c.y. can be placed for \$1.00/c.y. Is this realistic?
4. South Palm Beach - No comment.

Generally, the construction of an effective sand transfer plant together with sand fill placement and maintenance at the north end of Palm Beach, the middle of Palm Beach and south end of Palm Beach would appear to provide a system that would keep the Town's beaches in reasonably stable condition. From this standpoint, the Study appears to be well thought out and formulated. We congratulate the Corps on the completion of a very comprehensive and difficult undertaking.

The preceding constitutes the staff comments on the subject document and does not represent an official position by the Town via its elected officials. If you desire an official endorsement or comment, please let us know and we will present same to our Mayor and Town Council for their consideration.

Very truly yours,



Albert P. Dusey  
Director of Public Works

APD/ck

c: Robert J. Doney, Town Manager  
James M. Bowser, Town Engineer & P.W. File

Table II. 5.1. Summary of USACOE Maintenance Dredge Volumes, 1948 to 1994

Date	Numeric Date	Location	Disposal	Estimated (cy)	Actual (cy)	Shoaling (cy/yr)	Total Cost (\$)
Mar. 1994	1994.25				178,000	273,846	
Jun. 1993	1993.60				40,000	23,810	
Nov. 1991	1991.92				87,335	54,928	
May 1990	1990.42	STP Ceases Operation			Sub-Total 305,335	Average 77,892	
Apr. 1990	1990.33		Beach	86,300	75,351	67,278	
Feb.-Mar. 1989	1989.21	Ent. Channel	Beach	99,000	105,576	64,771	\$920,000
Feb.-Dec. 1987	1987.58	Chan.&Basin	Beach	174,790	135,402	314,888	\$594,746
Feb. 1985	1987.15	Ent. Channel	Off&Beach	132,000	130,803	58,656	\$944,246
Oct.-Dec. 1984	1984.92	Ent. Channel	Nearshore	101,000	110,799	67,975	\$1,002,876
Mar.-Apr. 1983	1983.29	Ent. Channel	Offshore	825,000	176,171	128,592	\$440,352
Nov. 1981	1981.92	Ent. Channel	Offshore	21,334	21,334	31,842	
Mar. 1981	1981.25	Ent. Channel	Offshore	29,955	29,955	36,090	\$200,000
May 1980	1980.42	Ent. Channel	Offshore	26,769	26,769	62,253	\$221,914
Dec. 1979	1979.99	Ent. Channel	Offshore	24,925	24,925	17,190	\$78,872
Jun.-Jul. 1978	1978.54	Ent. Channel	Upland	38,000	43,559	14,969	\$195,842
Jul.-Aug. 1975	1975.63	Ent. Channel	Upland	81,000	68,090	40,772	\$224,711
Nov.-Dec. 1973	1973.96	Ent. Channel	Upland	159,000	145,498	92,087	\$202,511
Apr.-May 1972	1972.38	Ent. Channel	Upland	138,000	131,538	65,769	\$164,902
Apr.-May 1970	1970.38	Ent. Channel	Nearshore	45,000	61,949	36,227	\$123,898
		Channel Deepened			Sub-Total 1,287,719	Average 64,547	
Aug. 1968	1968.67			11,500	11,500	4,752	\$20,480
Mar. 1966	1966.25			11,378	11,378	22,756	
Sep. 1965	1965.75			43,601	43,601	117,841	\$47,061
Apr.-May 1965	1965.38			25,700	25,700	17,603	\$35,694
Nov. 1963	1963.92			31,506	31,506	32,819	\$23,503
Nov.-Dec. 1962	1962.96			44,559	44,559	39,433	\$81,702
Oct. 1961	1961.83			3,188	3,188	4,554	\$5,280
Jan.-Feb. 1961	1961.13			18,851	18,851	15,579	\$36,371
Nov. 1959	1959.92			10,208	10,208	9,815	\$25,548
	1958.88			7,734	7,734	10,595	\$17,920
Aug. 1958	1958.67	STP Begins Operation			Sub-Total 208,225	Average 19,793	
Feb. 1958	1958.15			24,351	24,351	55,343	\$23,920
Aug.-Sep. 1957	1957.71			28,421	28,421	37,895	\$30,279
Nov.-Dec. 1956	1956.96			67,960	67,960	49,246	\$27,463
Jul. 1955	1955.58			46,694	46,694	19,216	\$12,530
Feb. 1953	1953.15			46,037	46,037	40,032	\$24,710
1952	1952.00			57,120	57,120	57,120	\$20,622
1951	1951.00			122,928	122,928	122,928	\$34,342
1950	1950.00			45,410	45,410		\$26,948
1948	1948.00						
Channel Deepened					Sub-Total 438,921	Average 43,243	
					Total 2,240,200	Average 48,437	

**RESPONSE TO COMMENTS FROM THE TOWN OF PALM BEACH, LETTER DATED  
OCTOBER 4, 1996.**

The estimated volumes dredged at Lake Worth Inlet in the Town's Inlet Management Plan prepared by Applied Technology Management are inaccurate. The fact that emergency dredging was required while the plant was inoperable is irrelevant. Emergency dredging was required in 1980, 1981 and 1985, all years in which the sand transfer plant was operational. A small shoal moved by storm energy into the channel will adversely affect navigation irrespective of the location, size and operational capabilities of the plant.

We have no authority to recommend reimbursement for the work accomplished by the Town to date for the refurbished sand transfer plant. To be eligible, the project must first be authorized by Congress. The new sand transfer plant at Lake Worth Inlet was authorized by the Water Resources Development Act of 1996, subject to a report of the Chief of Engineers. We anticipate a Chief of Engineers report in December 1996. Next, the design documents to support project construction must be prepared. Then a project cooperation agreement (PCA) must be executed between the Corps and the project sponsor. Assuming that the Town of Palm Beach is the project sponsor, only work performed by the Town after execution of the PCA is eligible for reimbursement.

The new sand transfer plant will be constructed by the Corps. The Corps cannot participate in the operation and maintenance of shore protection projects, since this is prohibited by Federal law. The one exception is periodic nourishment, which is considered construction for cost sharing purposes. After construction, the plant would be operated for a short time by the Corps jointly with the project sponsor to insure that the plant is functioning adequately. Afterward, it will be the responsibility of the non-Federal sponsor to operate and maintain the plant. The details of the plant, including the type of equipment used, will be worked out during the preconstruction, engineering and design phase of the project.

The cost estimate for the north end of Palm Beach Island is appropriate for this phase of the study. The report reflects conditions of the shoreline based on surveys taken in 1990. Actions taken such as those you describe at Mid-Town in 1995 and 1996 could not be incorporated into this document, which was essentially completed by May 1995. It is noted that the comments provided do not reflect the official position of the Town of Palm Beach.



STATE OF FLORIDA  
DEPARTMENT OF COMMUNITY AFFAIRS

EMERGENCY MANAGEMENT • HOUSING AND COMMUNITY DEVELOPMENT • RESOURCE PLANNING AND MANAGEMENT

LAWTON CHILES  
Governor

JAMES F. MURLEY  
Secretary

October 11, 1996

Mr. A. J. Salem  
Department of the Army  
Jacksonville District Corps of Engineers  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

RE: Beach Erosion Control Projects - Draft Feasibility  
Report and Draft Environmental Impact Statement for the  
Coast of Florida Erosion and Storm Effects Study,  
Region III - Palm Beach, Broward and Dade Counties,  
Florida  
SAI: FL9608020623C

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Department of Environmental Protection (DEP) indicates that the DEP's Bureau of Beaches and Coastal Systems and Division of Marine Resources (DMR) require continued coordination with the Corps of Engineers (Corps) during future project planning, design and permitting phases. The DMR has provided recommendations, as enclosed and summarized below, for consideration prior to completion of the final Environmental Impact Statement (EIS) and individual project designs. The DEP suggests that separate Supplemental Environmental Impact Statements be prepared to accompany the General Design Memorandum for each of the projects contained in the draft EIS and to include:

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100

FLORIDA KEYS AREA OF CRITICAL STATE CONCERN  
FIELD OFFICE  
2796 Overseas Highway, Suite 212  
Marathon, Florida 33050-2227

SOUTH FLORIDA RECOVERY OFFICE  
P.O. Box 4022  
8600 N.W. 36th Street  
Miami, Florida 33159-4022

GREEN SWAMP AREA OF CRITICAL STATE CONCERN  
FIELD OFFICE  
155 East Summerlin  
Bartow, Florida 33830-4641

Mr. A. J. Salem  
October 11, 1996  
Page Two

- Detailed information regarding potential impacts to hardbottom communities, seagrass beds, marine turtle habitat, and fisheries resources;
- The extent and location of proposed mitigation for impacts to hardbottom communities;
- Identification of the specific borrow areas and results of related geotechnical investigations; and
- Measures for avoiding and minimizing impacts to significant marine resources within the project area.

Please refer to the enclosed DEP comments for further details.

The Treasure Coast Regional Planning Council, the South Florida Regional Planning Council, the City of Boca Raton, and the City of Delray Beach have provided comments and recommendations for consideration during future phases of project planning and design. In addition, the City of Delray Beach indicates that the design reduction for the Delray Beach Renourishment project as proposed in the draft EIS is inconsistent with its comprehensive plan. The Corps is encouraged to coordinate the individual projects closely with the affected jurisdictions and to continue to work with the City of Delray Beach in order to resolve the comprehensive plan conflict. Please refer to the enclosed comments.

The Department of State (DOS) notes that the Corps will coordinate project activities with the DOS on a case-by-case basis. Conditioned upon the Corps' coordination with the DOS, the above project will have no adverse impact on any identified significant archaeological or historic sites. Please refer to the enclosed DOS comments.

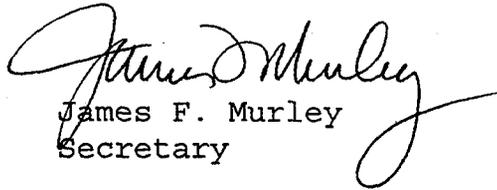
Based on the information contained in the draft feasibility report, draft EIS and the enclosed comments provided by our reviewing agencies, the state has determined that, at this stage,

Mr. A. J. Salem  
October 11, 1996  
Page Three

the above-referenced project is consistent with the Florida Coastal Management Program (FCMP). All subsequent environmental documents prepared for this project must be reviewed to determine the project's continued consistency with the FCMP. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and subsequent reviews.

If you have any questions regarding this letter, please contact Ms. Keri Akers, Clearinghouse Coordinator, at (904) 922-5438.

Sincerely,

  
James F. Murley  
Secretary

JFM/rk

Enclosures

cc: Jim Wood, Department of Environmental Protection  
Michael J. Busha, Treasure Coast Regional Planning Council  
Eric Silva, South Florida Regional Planning Council  
Ronald G. Laccheo, City of Boca Raton  
John Walker, City of Delray Beach  
George W. Percy, Department of State



# Department of Environmental Protection

Lawton Chiles  
Governor

Marjory Stoneman Douglas Building  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000

Virginia B. Wetherell  
Secretary

September 27, 1996

Keri Akers  
State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, Florida 32399-2100

RE: COE/Draft Feasibility Report and Draft Environmental Impact Statement (EIS),  
Coast of Florida Erosion and Storm Effects Study  
SAI: FL9608020623C

Dear Ms. Akers:

The Department of Environmental Protection supports the completion of this study and will continue to participate in its development. The Department's Bureau of Beaches and Coastal Systems (BBCS) is assisting the Army Corps of Engineers in completing the evaluation of erosion along Florida's coast. The BBCS has no further comments to offer at this time. Based on the review of this draft report and EIS, the Department's Division of Marine Resources (DMR) provided the following comments and recommendations. These comments should be addressed in the final document and considered as individual projects are planned and designed in the future.

DMR finds that the feasibility report contains a comprehensive evaluation of beach management strategies for Region III. As noted in the draft EIS, many environmental issues remain unresolved. DMR recommends that a Supplemental Environmental Impact Statement accompany the detailed General Design Memoranda that will be prepared for each project contained within the feasibility report and scheduled for implementation. It is also recommended that staff of DMR and other State of Florida resource agencies be consulted for input into the final EIS and subsequent documents.

The selected plan includes multiple shore protection and inlet management strategies for Dade, Broward, and Palm Beach Counties. Recommended actions include beach restoration with subsequent nourishment, creation of nearshore berms, and inlet sand transfer strategies. The document assesses, in general terms, potential impacts to hardbottom communities, seagrass beds, marine turtle habitat and fisheries resources, but detailed biological resource information is lacking on a project-by-project basis. For example, seagrass maps used in the study were prepared from data collected many years ago, at different scales and without the benefit of sufficient field verification. The study recommends mitigation for unavoidable impacts to hardbottoms. No

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Page 2

details are given as to the extent or location of such mitigation. Additionally, regional sources of borrow material are identified, although specific borrow areas and detailed geotechnical investigations are not provided.

As noted above and in references to the need for additional "tiered" documentation of measurable impacts, the document lacks the specific detail for a project-by-project analysis. The following issues will be of particular importance to DMR as it reviews proposed projects:

1. Use of Bahamian sand, and its potential beach performance and impacts to marine turtle nesting and incubation;
2. Impacts to sea turtles based upon specific timing of individual projects, sediment compatibility, and appropriate mitigation of compaction, escarpments and habitat degradation associated with construction activity;
3. Direct and indirect impacts on seagrass beds specifically located within south Dade County and within the vicinity of inlets;
4. Direct and indirect impacts on hardbottom communities located within the vicinity of borrow areas, access corridors, and fill areas;
5. Direct and indirect impacts to important recreational fisheries, such as snook, associated with inlet and adjacent beach habitats; and,
6. Feasibility of mitigating loss of seagrass and hardbottom communities.

DMR recommends that final project designs avoid impacts to significant resources expected within the project area (e.g., hardbottoms, sea grasses, marine turtle nesting habitat, etc.) and minimize potential impacts to others. DMR staff should be consulted during the preparation of project-specific documentation to ensure that the best information is available and state resource management policies are considered.

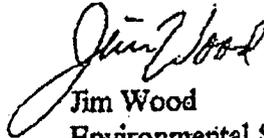
While the level of detail provided in the feasibility report and draft EIS does not allow for complete analysis of impacts, subsequent tiered documentation provided by the U. S. Army Corps of Engineers will provide the opportunity to address these issues thoroughly. The information included in the feasibility report provides the groundwork for the preparation of the final design memoranda and associated documents. Subsequent State Clearinghouse coordination of the design memoranda and supplemental EISs for each project will allow for final consistency reviews by state agencies based on more site-specific data and information.

FL9608020623C

Page 3

The Department appreciates the opportunity to review this draft study and EIS. If I may be of further assistance, please contact me at (904) 487-2231.

Sincerely,



Jim Wood  
Environmental Specialist  
Office of Intergovernmental Programs

/jw

cc: Fritz Wettstein, Division of Marine Resources  
Mark Leadon, Bureau of Beaches and Coastal Systems



FLORIDA DEPARTMENT OF STATE  
 Sandra B. Morham  
 Secretary of State  
 DIVISION OF HISTORICAL RESOURCES  
 R.A. Gray Building  
 500 South Bronough Street  
 Tallahassee, Florida 32399-0250

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Director's Office  
 (904) 488-1480

Telecopier Number (FAX)  
 (904) 488-3353

State of Florida Clearinghouse

August 27, 1996

Ms. Keri Akers  
 State Clearinghouse  
 Department of Community Affairs  
 2555 Shumard Oak Boulevard  
 Tallahassee, Florida 32399-2100

In Reply Refer To:  
 Frank J. Keel  
 Historic Preservation Planner  
 (904) 487-2333  
 Project File No. 963133

RE: Cultural Resource Assessment Request  
 SAI# FL9608020623C  
 Coast of Florida Erosion and Storm Effects Study, Region III, with Draft  
 Environmental Impact Statement  
 Palm Beach, Broward and Dade Counties, Florida

Dear Ms. Akers:

In accordance with the provisions of Florida's Coastal Zone Management Act and Chapter 267, *Florida Statutes*, as well as the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*, or otherwise of historical or architectural value.

Upon review of the referenced document, it is our opinion that the historic preservation concerns of this office have been adequately addressed. We note that Corps of Engineers will coordinate project activities with this agency on case-by-case basis. Therefore, conditioned upon this coordination, the project will have no effect to the historic properties listed on eligible for listing in the *National Register of Historic Places*, or otherwise of historic or archaeological value.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

*for Laura A. Kammerer*  
 George W. Percy, Director  
 Division of Historical Resources

and  
 State Historic Preservation Officer

GWP/Kfk  
 xc: Jasmin Raffington, FCMP-DCA

COUNTY: State

Message:

*JW @/24/96*

DATE: 08/05/96  
COMMENTS DUE-2 WKS: 08/19/96  
CLEARANCE DUE DATE: 09/16/96  
SAI#: FL9608020623C

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs  
Environmental Protection  
 Game and Fresh Water Fish Comm  
Health and Rehabilitative Services  
State  
Transportation

South Florida WMD  
  
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Environmental Policy/C & ED  
  
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OFFICE OF ENVIRONMENTAL SERVICES

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of the Army - Draft Feasibility Report  
- Draft Environmental Impact Statement for the Coast of Florida Erosion and Storm Effects Study, Region III - Palm Beach, Broward and Dade Counties, Florida.

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To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(904) 922-5438 (SC 292-5438)  
(904) 487-2899 (FAX)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: ~~FL96080~~ F.G.F.W.F.C.  
Reviewer: J. Woblick  
Date: 8/22/96